GOVERNMENT OF MADHYA PRADESH

MADHYA PRADESH STATE AGRICULTURAL MARKETING BOARD

KISAN BHAWAN, 26, ARERA HILLS, JAIL ROAD BHOPAL

TENDER NOTICE

TENDER REFERENCE NO: 2026_MPSAM_494752
DATE OF NOTICE: 28.03.2026

Selection of an EPC Contractor for turnkey implementation of an AI-based voice-enabled communication and broadcasting system with audio-visual advisory devices for farmers across APMCs of Madhya Pradesh for 24 months

TENDER DOCUMENT

Issued by:
Madhya Pradesh State Agricultural Marketing Board
[Full Address]
Bhopal, Madhya Pradesh

DISCLAIMER:

1. The information contained in this Tender Document or subsequently provided to Interested Parties, whether verbally or in documentary or any other form by or on behalf of M.P. State Agricultural Marketing Board, Bhopal ("MPSAMB") or any of its employees or advisers, is provided to Interested Parties on the terms and conditions set out in this Tender Document and such other terms and conditions subject to which such information is provided.

2. This Tender Document is not an agreement or an offer by M.P. State Agricultural Marketing Board, Bhopal ("MPSAMB") to the Interested Parties or any other person. The purpose of this Tender Document is to provide Interested Parties with information that may be useful to them in making their proposals pursuant to this Tender Document. This Tender Document includes statements, which reflect various assumptions and assessments arrived at by MPSAMB in relation to the proposal. Such assumptions, assessments and statements do not purport to contain all the information that each Interested Party may require. This Tender Document may not be appropriate for all people, and it is not possible for MPSAMB, its employees or advisors to consider the objectives, technical expertise and particular needs of each party who reads or uses this Tender Document. The assumptions, assessments, statements and information contained in this Tender Document may not be complete, accurate, adequate or correct. Interested Parties should, therefore, conduct their own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in this Tender Document and obtain independent advice from appropriate sources.

3. Information provided in this Tender Document is on a wide range of matters, some of which may depend upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. MPSAMB accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.

4. MPSAMB, its employees and advisors make no representation or warranty and shall have no liability to any person, including any Interested Party under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this Tender Document or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the Tender Document and any assessment, assumption, statement or information

contained therein or deemed to form part of this Tender Document or arising in any way in this Selection Process.

5. MPSAMB also accepts no liability of any nature whether resulting from negligence or otherwise however caused arising from reliance of any Interested Party upon the statements contained in this Tender Document. MPSAMB may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumptions contained in this Tender Document.

6. The issue of this Tender Document does not imply that MPSAMB is bound to select/appoint an Interested Party and MPSAMB reserves the right to reject all or any of the Tender Documents without assigning any reason whatsoever. Interested Parties shall bear all their costs associated with or relating to the preparation and submission of their Tender Documents including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by MPSAMB, or any other costs incurred in connection with or relating to their Tender Documents. All such costs and expenses will remain with the Interested Party and MPSAMB shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by any Interested Party in preparation or submission of the Tender Document.

CONTENTS

NOTICE INVITING TENDER .....

1 Objectives.....

2 Amendments to Document .....

3 Information to Applicants.....

4 Instructions to Applicants .....

5 Minimum Eligibility Criteria.....

6 Preparation and Submission of Bid .....

7 Bid Opening & Evaluation Process.....

8 Award of Contract .....

9 Refund/Forfeiture of Earnest Money Deposit .....

10 Performance Security and Security Deposit.....

11 Allotment of Work.....

12 Litigation History .....

13 Conflict of Interest.....

Prescribed Forms / Annexure .....

MADHYA PRADESH STATE AGRICULTURAL MARKETING BOARD
26, ARERA HILLS, KISAN BHAWAN, BHOPAL

NOTICE INVITING TENDER

Board/Const/PC/DVI-2/2025-26/2484 **Date: 28.03.2026**

Online Lump-Sum Rate E-Tenders are invited in from the eligible bidders for the following works so as to be received online up to **5:30 PM on Dated 24.04.2026.** The tender documents can be obtained online on the http://mptenders.gov.in as per the Notice Published on the above Portal and detailed information can also be seen on website www.mpmandiboard.gov.in

(Name of work : Selection of an EPC Contractor for turnkey implementation of an AI-based voice-enabled communication and broadcasting system with audio-visual advisory devices for farmers across APMCs of Madhya Pradesh for 24 months). Interested firms may submit their proposals on e-procurement portal i.e. www.mptenders.gov.in

No	System Tender Number	Probable Amount of Contract (in lakhs)	Earnest money deposit (EMD) (Rs.)	Cost of Tender Form (Rs.)	Time Period Including rainy season
1	2026_MPSAM_494752	2533.41	12,67,000.00	50,000.00	3 Months

Note: - Any corrigendum in this NIT if required shall be displayed only in our above portal regarding any matter included in this NIT or otherwise. Other details of Work and locations & key dates can also be seen on our website www.mpmandiboard.gov.in.

1. **Purchase of Tender Document:** The Tender Document can be purchased only online from http://mptenders.gov.in by making online payment of the cost of Tender Document and service charges through net-banking, cash card or ATM-cum-Debit Card as per Key date.
2. **Submission of Tenders:** The Bids shall be submitted online in 3 Envelopes as follows: -
    - **Envelope 'A'-** online payment receipts of cost of tender document and EMD and eligibility documents.
    - **Envelope 'B'-** Technical Proposal containing all the technical details, specifications of the proposed work, terms and conditions, tentative drawings, diagrams etc. in clear and exhaustive manner. *Annexure F* shall also be submitted online on this envelope.
    - **Envelope 'C'-** Financial Offer (also called 'Financial Bid') containing lump sum Financial Offer in words and figures.
3. **At the time of submission of the Bid (Envelope "A") the eligible bidder shall be required to submit:**
    A. Receipt of payment of Bid Document.

B. Receipt of payment of Earnest Money Deposit. Scanned copy of EMD instrument shall be uploaded online along with the reference details.

C. Submit a check list.

E. Organizational Detail as per Annexure 'H'.

F. P.A.N & G.S.T. Registration Certificate

G. Submit online affidavit on non-judicial stamp of Rs. 200/- Duly Notarized in original saying that all submitted / uploaded documents with technical bid online are correct in my knowledge & No relationship certificate between dept. employee & officer with him.

4. **Eligibility Criteria:** (Envelope "B") (documents related to clause 5. Minimum Eligibility Criteria must be submitted under this)

Section	Details / Requirements
Eligibility Criteria Documents (Envelope "B")	
A	CVs and List of Key Personnel and Engineers under employment.
B	Power of Attorney in favor of authorized Signatory or Representatives. Details of Works in hand (Name of Work, Work Order references, Agreement, Value, Period of Completion) duly certified by competent authority.
C	Undertaking in **Annexure-B.**
D	Other relevant documents.
OEM Requirements (Data Visualization Interface)	
MAF/Authorization	OEM Ink signed MAF/Authorization mentioning tender details for the Data Visualization Interface (and for every OEM for hardware/software offered).
Compliance Confirmation	OEM Ink signed compliance confirmation on OEM letterhead for the entire solution (hardware, software, drawings, design) to confirm line items and services.
Registered Office in MP	Ink signed confirmation that OEM has its own registered office in MP for the last 5 years. Supporting documents: GST certificate, Gumasta, or any document issued by MP Govt. in the OEM's name.
Service Centers	OEM confirmation/undertaking that DVI OEM has a minimum of 20 service centers in MP.
OEM Turnover	DVI OEM must have a minimum turnover of ₹100 Crores in the last 3 years. (Self-attested supporting documents to be submitted by bidders).
Bidder Experience & Financial Eligibility	
Experience	Submission of work completion or supply certificates.

Section	Details / Requirements
Financial Eligibility	Audited financial statements or CA certificate showing average annual turnover of at least ₹30 Crores for FY 2022-23, 2023-24, and 2024-25. Copies of Income Tax Returns for the same years.
Net Worth	Bidder must have a positive Net Worth at the close of the financial year immediately preceding the Bid Due Date. (Certificate from CA required).
Technical Evaluation	
Presentation	The department will conduct a technical presentation of the solution prior to opening the financial bid. The department can reject the proposal if it does not meet technical functionality/parameters.
Earnest Money Deposit (EMD)	
3.1	EMD shall be in the form of on-line transfer into the scheduled bank account given in the bid data sheet. Details of the online transfer receipt must be submitted in Envelope "A".
3.2	Bids not accompanied by EMD shall be liable for rejection as non-responsive.
Submission Procedure	
4	Bidders must follow the prescribed procedure for online submission of tenders on https://mptenders.gov.in. In case of doubt, contact the people concerned via the portal.

Key-Dates

S.No.	Details	Key-Dates
1	Publishing Date	02.04.2026, 10:30
2	Document Download/ Sale Start Date	02.04.2026, 11:30
3	Bid Submission Start Date	02.04.2026, 17:30
4	Bid Submission Closing Date	24.04.2026, 17:30
5	Bid Opening Date	27.04.2026, 11:30
6	Pre Bid Meeting Date	07.04.2026, 15:00

Executive Engineer (Project cell)

1 Objectives

1.1 The objective of this tender is to invite qualified and experienced bidders for the turnkey implementation of an AI-based voice-enabled communication and broadcasting system with audio-visual advisory devices for farmers across APMCs of Madhya Pradesh for 24 months under the purview of the Madhya Pradesh State Agricultural Marketing Board (MPSAMB).

2 Amendments to Document

2.1 - At any time prior to the deadline for submission of Tender Document, MPSAMB may, for any reason, whether at its own initiative or in response to clarifications requested by any Interested Party, or in its absolute discretion, without being under any obligation to do so, update, amend or supplement any information, objective, assessment or assumption contained in this Tender Document or modify the Tender Document by the issuance of addendum/corrigendum. The amendment will be notified to all the prospective bidders and uploaded on the website well before the last date of submission of proposals which will be binding on the bidders. The MPSAMB (also referred to as 'Client') may at their discretion extend the deadline for submission of the proposals (Interchangeably also called 'Tenders', 'Bids' and 'Offer' depending upon context in which it is used).

2.2 - Any addendum/corrigendum thus issued shall be part of this Tender Document and shall be posted on the www.mptenders.gov.in

2.3 Interested participants are required to check the website regularly for the updates related to the Tender Document before submitting the proposals.

3 Information for Applicants

3.1 Tender documents can be downloaded from the website www.mptenders.gov.in

3.2 Bids shall be submitted online on or before the date of submission mentioned in the schedule of Tender Document.

3.3 The application shall be submitted only as per the enclosed format(s) along with all the Annexure. Self-attested documentary proof(s) in respect of the details furnished in the application form shall be submitted along with the application.

3.4 The intending applicants shall also submit the list of such projects where due to any disputes, litigation/arbitration was invoked and / or services were abandoned/suspended by the Client. Suppression of any information in this regard may lead to cancellation of the agreement / participation of the bidder, if such information comes to the notice of MPSAMB Bhopal after award of contract.

3.5 Incomplete applications will be summarily rejected without any notice. No correspondence will be made in this subject, and applicant will be entirely responsible for the same.

3.6 The Authority has adopted a **three-envelope** selection process (collectively the "Selection Process") for evaluating the Proposals comprising of technical bids and financial bids to be submitted by the Applicant. For avoidance of doubt, both the Technical Proposal and the Financial Proposal shall be submitted only online through e-procurement portal.

3.7 MPSAMB Bhopal reserves the right to reject any or all applications without assigning any reason thereof.

3.8 Validity of Offer: The offer will remain valid for 120 days from date of opening of Financial Bid in Envelope C.

3.9 Conditional Tenders: Conditional Tenders are liable to be rejected.

Clarifications, if necessary, will be sought from the applicants. All information submitted by the applicants during the bidding process will be the property of MPSAMB Bhopal and will not be returned. Based on the assessment of the documents submitted by the bidder and recommendations of the evaluation committee, the qualified bidder will be selected, and the bidder will be informed by MPSAMB Bhopal.

3.12 The Content required for the Digital Communication shall be created and provided by the Mandi Board as per the approved design and specifications.

4 Instructions to Applicants

4.1 General

A) In case an applicant possesses the requisite experience and capabilities required for providing the services, it may participate in the Selection Process individually in response to this tender. Joint Venture is not allowed to participate under this Tendering Process.

B) Any entity which has been barred/Suspended for any period to participate Govt. E-Portal / Got any notice on nonperformance of the contract fulfilment or supply of non-complied equipment by any the State/ Central Government statutory authority or a public sector undertaking, as the case may be, from participating in any project, and the bar subsists as on the date of Proposal, would not be eligible to submit a Proposal either by itself or through its Associate. Bidder has to submit undertaking on company letterhead confirming on this point.

C) All information requested in the enclosed forms should be furnished against the respective columns in the format. Applicants are cautioned that non-submission of complete information as per the required formats or making any change in the prescribed forms may result in the application being summarily rejected.

D) The Proposal shall be typed or written in indelible ink and signed by the authorized signatory of the Applicant who shall initial each page. In case of printed and published documents, each page shall be initiated. All the alterations, omissions, additions, or any other amendments made to the Proposal shall be initialed by the person(s) signing the Proposal.

E) Copies of the references, information, work orders and completion certificates / any supporting document like Bank statement / confirmation on end-user letter head stating that given order is executed from the respective clients certifying the suitability, technical know-how, experience or capability of the applicant shall be submitted by the applicant, which could be verified by MPSAMB Bhopal, when required.

F) The applicants are advised to attach any additional information which they think fit and necessary with regard to proving their capabilities. No further information will be provided after submission of the application unless it is called for by the MPSAMB Bhopal.

G) The application must be proper and in sequence as per Tender Document.

h) The cost incurred by the applicants in preparation & submission of this application, providing clarifications or attending discussions in connection with process of bidding shall be borne by the applicant. MPSAMB Bhopal will in no case be responsible or liable for these costs regardless of the outcome of the process.

I) Each Applicant shall submit only one (1) Proposal, in response to this Tender Document. Any Applicant, who submits more than one Proposal, will be disqualified.

J) All document submitted /uploaded on Online portal by the bidder will be accepted for pre- qualification Only, while attested hard copy of all online documents uploaded, Affidavit and must be submitted at the time of agreement. k) The contractors are advised to visit the proposed site location and gather all relevant & required information / data regarding proposed contract work, leads and lifts of material etc. before submission of their offer. The bidders are also advised to visit places regarding access to the operation and running probability of communication and broadcasting systems.

K) All the essential conditions have been incorporated in the Tender Document, and it may not be necessary for the contractor to give any additional conditions. If any conditions are given, common set of conditions shall be framed as per procedure prescribed in the WD manual.

L) No Mobilization Advance or Price Escalation shall be payable under any circumstances

4.2 **Workmanship**: The work shall be carried out according to the specifications referred to hereinafter & according to sound engineering practice. The decision of the MPSAMB in respect of workmanship shall be final.

4.3 **Transportation of Materials**: The bidder must arrange and fully finance the transportation, handling, of all equipment/materials. MPSAMB shall not be liable for any damage, loss, delays, or costs incurred during these processes. The bidder must ensure timely delivery to the site without claiming additional payments or compensation from MPSAMB.

4.4 **Tests**: The supplied equipment will be verified by the third party nominated by the MPSAMB as per the standard procedure and the cost of the testing to be bear by the successful bidder.

4.5 **Time of Completion**: The time allowed for carrying out the work shall be strictly observed and shall be reckoned from the date of issue of written order to commence the work. Delays beyond the specified time limit will be subject to liquidated damage. The work shall be done by the contractor according to the schedule fixed in consultation with the competent authority. BAR/PERT/CPM chart showing detailed programs shall have to be submitted and adhered to by the contractor.

4.6 **Payment**: Payment to the Contractor shall be made in accordance with schedule given in General Conditions of Contract'.

4.7 Taxes: All dues regarding taxes, and duties including the commercial Taxes, Royalties, Octroi Duties, Excise Duties, Turnover Taxes etc. on work, Contract etc. levied on the contractor's work by Government and local bodies or private individuals will be payable by the contractor.

4.8 Labour Rules: The contractor will be bound to follow the Madhya Pradesh Model Rules, relating to labor Water Supply and Sanitation in labour camps, and the provisions of the National Building Code of India, about construction and safety. The contractor(s) shall pay not less than the fair wages to labour engaged by him on the work. He shall also obtain Labour License, submit labour reports and follow all the rules as per M.P. Labour Act/Rules in force. The Contractor/ Firm shall have to get registered himself/themselves within the 60 days from the date of work order under "Bhawan and Anya Sanirman Karmkar Adhiniyam 1996" and submit the registration certificate to the MPSAMB.

4.9 Right to Increase or Decrease the Work: The MPSAMB may increase or decrease any item of work during the currency of the contract with mutual consent.

4.10 Defect Liability: The Contractor shall bear full responsibility for all defects and repairs, including a comprehensive 2-year defect liability period from the date of completion. For equipment covered under manufacturer warranties, the Contractor must transfer all original warranties to MPSAMB, ensuring they run concurrently with—but do not replace—the Contractor's liability. The Contractor remains solely accountable for all repairs, including costs exceeding warranty coverage, defects in expired or voided warranties, and timely resolution regardless of warranty claim status. Prior to commissioning, the Contractor must submit all warranty documentation and shall be financially liable for any warranty invalidation resulting from improper handling, installation.

4.11 Change in Constitution of Firm: Any change in the constitution of the firms / agency shall be forthwith notified by the contractor to the MPSAMB for the information.

4.12 Settlement of Disputes: The Client and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract. If, after thirty (30) days from the commencement of such informal negotiations, the Client and the Contractor have been unable to resolve amicably resolve the dispute, either party may require that the dispute be referred to an arbitrator to be appointed by 'The Managing Director' of MP State Agricultural Marketing Board. The appointed Arbitrator shall make decision within 90 days of date the dispute is referred to for Arbitration. If either party is not satisfied with the decision or if the decision is not given within the period

mentioned herein the aggrieved party may seek redressal under Arbitration and Conciliation Act 1996.

4.13 Force Majeure: If failure in performance of any part of this contract arise, from war, insurrection, restraint imposed by Government, act of legislature or other authority, stoppage or hindrance in supply of raw material, or fuel, explosion, accident, strike, riot, lock out, or other disorganization, of labour or transport, breakdown of machine, flood, fire or act of God, or any irresistible or unforeseen event beyond human control directly or indirectly interfering any cause which may be a reasonable ground for an extension of time, the MPSAMB will allow such additional time as he considers to be justified in the circumstances of the case. No compensation will be payable to the contractor for any loss incurred by him due to these reasons.

4.14 Extension of Time: If the contractor shall desire any extension of the time for completion of the work on the grounds of his having been unavoidably hindered in its execution or any other ground, he shall apply in writing to the MPSAMB within 7 (seven) days of the date of hindrance on account of which he desires such extension as aforesaid, and the Officer, with whom he has signed the agreement shall, if in his opinion (which shall be final) find reasonable grounds, are shown therefore, may authorize such extension. The Milestone & Compensation for delay terms and conditions are applicable as per Annexure-G.

4.15 Action when Work is Left Incomplete, Abandoned or Delayed beyond the Permitted Limit Allowed by the Competent:

In any case in which under any clause or clauses of this contract the contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit (whether paid in one sum or deducted by installments) or committed a breach of any condition or in the case of abandonment of the work, except due to permanent disability or death of the contractor, or any other cause, the MPSAMB shall give a notice before 15 days, and in the event of the contractor failing to comply with the directions contained in the said notice, shall have power to adopt any of the following courses, as he may deem best in the interests of the Board.

a) To rescind the contract (of which rescission notice in writing to the contractor under the hand of the MPSAMB shall be conclusive evidence) and in which case the security deposit of the contractor shall stand forfeited and be absolutely at the disposal of Board.

b) To measure up the work of the contractor and to take such part thereof as shall be unexecuted out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (of the amount of which excess certificate in writing of the MPSAMB shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any money due to him by Board under the contract or otherwise or from his security deposit or the proceeds of sale thereof or a sufficient part thereof. If the work is carried out at lower rate the contractor shall not be entitled for any refund, on the account payable, if any, which shall go to the Boarding the event of any of the above courses being adopted by the MPSAMB, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any agreements or made any advances on account of, or with a view to, the execution of the work or the performance of the contract.

4.16 Applicable Law and Jurisdiction:

The Contract shall be governed by and interpreted in accordance with the applicable laws of the State and the Local Government. The Contractor shall ensure compliance of all such Laws, Acts, and Rules etc. as are applicable on the contract. Wherever it is imperative to do so as per requirement of the law or in response to a warranting situation, the client may or require the contractor to take necessary action to implement the law. The contractor shall have to submit information, returns or reports etc. to the Client or to the authority concerned as may have been provided in the relevant laws. Courts of Law at Bhopal only shall have exclusive jurisdiction over all matters arising out of or relating to this agreement.

4.17 Constituents of Agreement:

The NIT, Tender Document, All Annexure, and General Conditions of Contract, Any Amendments, Design and Drawing are all parts of the Agreement.

4.18 Definitions

4.18.1 In the document, the following words and expressions shall have the meaning hereby assigned to them except where the context otherwise requires:

"Employer / Client" means respective office of M.P. State Agricultural Marketing Board (MPSAMB) within its jurisdiction, and includes the employer's representatives, successors, administrators and assigns.

Bidder / Applicant / Firm / Agency" means Proprietary firm, Partnership firm, Private Limited Company, Limited Company whose application has been received by the employer and includes the applicant's personal representatives, successors, executors and assigns.

"MPSAMB": "MPSAMB" generally means the Madhya Pradesh State Agricultural Marketing Board. However, in certain places within this document, as required by the context, it shall also mean or include its authorized representative or person designated for the related work.

4.19 Method of Applying

4.19.1 The Proposals must be properly signed by the authorized representative (the "Authorized Representative") above his/her full type of written name and full name of firm/company with the current address as detailed below:

A) by the proprietor, in case of a proprietary firm; or
B) by all partners, in case of a partnership firm and/or a limited liability partnership or alternatively by a partner holding Power of Attorney for signing the application, in which case a certified copy of Partnership Deed shall accompany the application; or

C) by a duly authorized person holding the Power of Attorney for signing the application, in case of a Limited Company or a Corporation.

4.20 Right to reject any or all Proposals

4.20.1 Notwithstanding anything contained in this Tender Document, the Authority (MPSAMB) reserves the right to accept or reject any Proposal and to annul the Selection Process and reject all Proposals, at any time without any liability or any obligation for such acceptance, rejection or annulment, and without assigning any reasons thereof.

4.20.2 Without prejudice to the generality of above Clause, the Authority reserves the right to reject any Proposal if:

A) at any time, a material misrepresentation is made or discovered, or
B) the Applicant does not provide, within the time specified by the Authority, the supplemental information sought by the Authority for evaluation of the Proposal. Misrepresentation / improper response by the Applicant may lead to the disqualification of applicant

4.21 Pre-bid Conference

4.21.1 A Pre-Bid conference will be held at the Address mentioned below. Applicants may send their queries in writing by sending them through speed post / courier / in person to the address below at least 24 hours prior to the Pre-bid meeting date.All communications including the submission of Proposal should be addressed to:

Superintending Engineer
M.P. State Agricultural Marketing Board
Bhopal (M.P.)
Email: sejtmandiboard21@gmail.com
: se2mandiboard@zohomail.in

5 Minimum Eligibility Criteria

5.1 Applicants must read carefully the minimum conditions of eligibility (the "Conditions of Eligibility") provided herein. Proposals of only those Applicants who satisfy the Conditions of Eligibility will be considered for evaluation.

5.2 Bidder must fulfill technical and financial eligibility criteria stated below.

(A) Basic Eligibility criteria:

1. The applicant participating in the selection process:
   must be a registered firm, company or partnership firm with valid registration under applicable laws.
2. The Applicant must have a valid GST and Income-tax registration in India (proof of registration must be enclosed with technical proposal).
3. The Bidder Must Submit OEM Authorization wherever mention for the hardware offered.

(B) Pre-Qualification Criteria for Data Visualization Interface OEM:

1. OEM should have active business in India from last 10 years (Incorporation Certificate Required, PF Certificate, GST Registration required).
2. OEM should have registered own active office in Madhya Pradesh from last 5 years for onsite support. (shop license, GSTN certificate required as proof).
3. OEM should have at least one Direct service Centre in the Madhya Pradesh from last 5 years (shop license, GSTN certificate required as proof) OEM Own Authorized Service Centre in MP
4. OEM should have R&D, Quality Control & Factory setup in India to provide timely updates with ISO9001, ISO14001, ISO45001 certificates.

(C) Experience and Technical Capacity

The Bidder shall furnish documentary evidence to demonstrate that it meets the following experience requirement(s):

Bidder should have executed contracts for similar type of Supply, Installation, Testing and commissioning of Digital Broadcasting solution/ ITES Project/IT Infrastructure or Setting up ICT/Smart display system in multiple locations to any of the GOVT. Institutions / Department (Central / State / Public Sector Under taking), Satisfactorily completed during the last 5 years with value of each contract to be at least as per the following table:

Description	Value	
A	Single Work Order Value in Rs	Rs 7.00 Crore
B	Two Work Order, each Work order Value in Rs	Rs 3.50 Crore
C	Three Work Order, each Work order Value in Rs	Rs 2.30 Crore

Completion **details are**

A. Bidder to provide copy of the Contract /Work order along with Work Completion Certificate from Client confirming the payments made towards the assignment.

OR

B. Letter from Chartered Accountant confirming completion or on-going status where project completed at least 1 year of O&M period and received 50% of the contract value. Also Bidder to provide undertaking on Rs100/- Non Judicial Stamp paper to confirm similar type of implementation of Supply, Installation, Testing and commissioning of IT Infrastructure or Setting up Video Broadcasting setup/Virtual Audio/ Video Labs for any Institutions / Department (Central / State / Public Sector Under taking) in which the project shall have completed O&M period, in last 5 years from the date of Bid submission

Completion certificate will be accepted against following definitions for Completed and Ongoing projects: Completed means Project completed its implementation and O&M both with satisfactory remarks reflected in Client Certificate

- Ongoing means Project Completed its implementation and completed at least 1 year of O&M period with satisfactory remarks reflected in the Client Certificate Bidder is to submit documentary evidence substantiating works executed with Contracts Awarded and completion certificates from any of the Institutions / Department (Central / State / Public Undertaking).

(D) Financial Capacity:

The bidder must have an average annual turnover of not less than ₹ 30 crore during the financial years 2022–23, 2023–24, and 2024–25. (Copy of Income Tax returns or Certificate from Chartered Accountant should be submitted for verification.)

The Bidder Should Have a positive Net Worth at the close of the financial year immediately preceding the Bid Due Date. (Certificate from Chartered Accountant should be submitted for verification.)

6 Preparation and Submission of Bid

Tenderers are requested to prepare Technical and Financial proposals in English language. The Bids shall be submitted online in 3 Envelopes as follows: -

Envelope 'A'- online payment receipts of cost of tender document and EMD and eligibility documents.

Envelope 'B'- Technical Proposal containing all the technical details, specifications of the proposed work, terms and conditions, tentative drawings, diagrams etc. in clear and exhaustive manner. 'Annexure- F' shall also be submitted online in this envelope.

Envelope 'C'- Financial Offer (also called 'Financial Bid') containing lump sum Financial Offer in words and figures.

6.1 All the applications received shall be evaluated based on information and documents submitted by the applicant. Applicants must submit soft copies of all the relevant paper to meet the qualifying criteria to get qualified. All documents should be sealed & signed by the applicants.

6.2 All information called for in the enclosed forms should be furnished against the relevant columns. If for any reason, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column, a 'NIL' or 'NO SUCH CASE' entry should be made in that column. If any particular / query is not applicable in case of an applicant, it should be stated as "not applicable". The applicants are cautioned that not giving complete information called for in the application forms or not giving it in clear terms or making any change in the prescribed forms or deliberately suppressing/furnishing false information may result in the applicant being rejected.

6.3 Overwriting should be avoided. Correction, if any, should be made by neatly crossing out, initialing, dating and rewriting.

6.4 Any information furnished by the applicant found to be incorrect either immediately or later would render him liable to be debarred from pre-qualification / tendering / taking up works in MPSAMB, Bhopal.

7 Bid Opening and Evaluation Process

7.1 Opening of Eligibility Criteria and Technical Proposal: The online submitted Eligibility Criteria and Technical Proposal shall be opened first.

7.2 Verification of EMD and Eligibility Documents: The envelope marked 'EMD/Eligibility Documents and Other Required Documents' (from the outer envelope) shall be opened. The online EMD should be matched and verified. The submitted Eligibility Documents shall be checked and verified.

7.3 MP Stores Procurement Rules 2015 (as amended 2022) will be applicable for this Tender.

7.4 Technical Bid Opening:

- After successful verification of the EMD and Eligibility Documents, the online envelope 'B' containing the Technical Bid shall be opened. Only contractors deemed eligible will have their **Technical Bids** evaluated by the competent authority or a designated **MPSAMB Committee**.

7.5 Opening of Financial Bids:

- The **Financial Bids** shall be opened online and evaluated. The evaluation of the financial bid shall be conducted based on the lowest lump sum offer received from the qualified bidders. Only those bidders who meet the eligibility criteria and technical requirements as specified in the tender document will be considered for financial evaluation. The bidder offering the lowest lump sum amount for the entire scope of work shall be deemed the successful bidder, subject to meeting all other terms and conditions. In case similar rates are received from two or more bidder, closed cover offer shall be invited from such bidders to finalize the bid. Only lower rates shall be accepted.

8 Award of Contract the Contractor shall be notified of acceptance of tender through a Letter of Award (LOA). He shall deposit 05% of the 'amount of Contract as per his offer, as Performance Security within 10 (Ten) days of such intimation in the form of Term Deposit Receipt (TDR) / Fixed Deposit Receipt (FDR) / Bank Guarantee (BG) of any Nationalized / Schedule commercial bank in favor of Account Officer, MP State Agricultural Marketing Board Bhopal and shall sign the agreement. The EMD will be refunded to the contractor if he deposits performance Security as per the tender document.

9 Refund/Forfeiture of Earnest Money Deposit

i) Earnest Money Deposit of unsuccessful Contractors will be refunded after opening of the financial bid to the account from whom it transfers or on expiry of the validity period of the proposal whichever is earlier.

ii) Earnest Money Deposit of the successful Contractor will be refunded after deposit full amount of performance security and operation performance security and agreement executed.

iii) Earnest Money Deposit shall be forfeited if the Contractor withdraws or modifies his proposal after submission during its validity period.

iv) Earnest Money Deposit shall be forfeited if the successful bidder fails to deposit performance security and execute agreement within the stipulated period.

10 Performance Security and Security Deposit

Performance Security Requirement: The Performance Security shall be 5% of the Financial Offer as accepted by MPSAMB. This amount shall be deposited by the Contractor.

Security Deposit Deduction: An additional 5% of the bill amount shall be recovered as a Security Deposit from the Running Bills paid to the Contractor.

Refund Process: 25% of the Performance Security and Security Deposit shall be refunded: 1 year after the successful operation of the project. Subject to the issuance of an Operational Certificate by the MPSAMB. Deductions will be made for any sums due from the contractor, including:

- Bad workmanship.
- Defects and repair costs.
- Compensation for delay, penalties, and dues.

Final Refund: The remaining 75% of the Performance Security and Security Deposit shall be refunded:

- After 3 years of communication and broadcasting system operation.
- Subject to the issuance of 'No Dues and Operational Certificate' from the **MPSAMB**.
- Cross-checking shall be conducted by the **MPSAMB**.

The security deposit required under this tender may be replaced by an equivalent amount in the form of a Fixed Deposit Receipt (FDR) of the same duration as the period specified for the refund of the security deposit.

11 Allotment of Work

A) The work shall be awarded to the technically qualified bidder who submits the lowest lump sum offer during the financial bid evaluation. In case of requirement, MPSAMB (Madhya Pradesh State Agricultural Marketing Board) reserves the right to reduce or extend the scope of work under the same rates, terms, and conditions as agreed upon in the original contract subjected to the applicable rules.

B) The bidder must meet all eligibility criteria and successfully pass the technical evaluation to qualify for financial bid consideration.

12 Litigation History

12.1 The Applicant should provide accurate information on any litigation or arbitration resulting from contracts completed or under its execution over the last Five (5) years from the Proposal Due Date (the "PDD"). A consistent history of litigations against the Applicant may result in failure of the application at the desertion of MPSAMB.

13 Conflict of Interest

13.1 An Applicant shall not have a conflict of interest that may affect the Selection Process (the "Conflict of Interest"). Any Applicant found to have a Conflict of Interest shall be disqualified. In the event of disqualification, the Authority shall forfeit and appropriate the Bid Security as mutually agreed genuine pre-estimated compensation and damages payable to the Authority for, inter alia, the time, cost and effort of the Authority including consideration of such Applicant's Proposal, without prejudice to any other right or remedy that may be available to the Authority hereunder or otherwise.

ANNEXURES

Annexure A

Financial Proposal

(To be submitted online Only)

In response to the NIT No. ..... Dt. ..... issued by the MP State Agriculture Marketing Board, Bhopal, I/We hereby offer to execute the whole work mentioned below at the amount specified herein :-

Cost for Digital Data Visualization Interface – Installation, commission and Go-Live

NO.	SUPPLY ITEMS	UOM	QTY	Unit Amount with GST (In INR)	Total Amount Quoted by Bidder (4x5)
1	2	3	4	5	6
1	Fully active direct-view LED Display System having a minimum active viewing dimension of approximately 2880 mm (W) × 1920 mm (H), forming a seamless unified display surface with total native pixel resolution not less than 432 × 288 pixels including Digital Multimedia System , Media box ,Horn Speaker, wall mounted AI based System advisor as per SOW including Power cable, rack, Networking components like cables and connectors , switch, electrical wiring , Requisite Outdoor Rack for all hardware devices Installation, Testing & Commissioning including civil work	Nos	53		
2	65-inch diagonal screen size Native resolution shall be 3840 x 2160 pixels (4K Ultra HD) with support for various input signal formats including 1080p, 1080i, 720p, and 480p. The panel must deliver a minimum brightness of 500 nits for adequate visibility in well-lit commercial environments Digital Multimedia System ,Enterprise Grade Audio Advisory Interface,wall mounted AI based System advisor as per SOW , Media box, rack, router, signal cables, switch, electrical wiring , Requisite Outdoor Rack for all hardware devices Installation, Testing & Commissioning including civil work	Nos	02		
3	Centralized Command and Control at State Headquarter Supply, Installation, Testing and Commissioning (SITC), including all associated civil works, of the Command Control Centre setup as per the detailed specifications and Scope of Work (SOW),	Nos.	01		
4	Operation and Maintenance (O&M) for a period of 2 years.	Month	24		

Notes:

1. The Financial Offer is inclusive of all Taxes, Duties, Octroi, Service Tax, GST etc. and no extra payment shall be made on this account.
2. All other tasks pertinent to the contract even though not mentioned above are assumed to have been included in this offer.
3. Earnest money of Rs. ..... has to be deposited online.

This tender be accepted I/we hereby agree to abide by and fulfill all the terms and conditions of contact annexed hereto, or in default thereof, to forfeit and pay to the MP State Agriculture Marketing Board, Bhopal or his successors the penalties or sums of money mentioned in the said conditions.

I/we understand and agree that the said earnest money will be forfeited if; I/we fail to sign the contract documents and commence the work within the stipulated time.

Date:

(Signature, name and designation of the authorized signatory)

(Name and seal of the Applicant)

Annexure B

UNDERTAKING

(To be submitted in envelope marked 'Other Required Documents')

I/we hereby solemnly affirm that: -

1. I/we have visited the sites of APMC and taken note of their present status,
2. I/we fully understand the scope of work, all terms and conditions and work schedules etc. and that I/we am/are submitting my/our tender taking the facts stated above into consideration.
3. I/We have read the complete Tender Document and agree to abide by the Terms and Conditions contained therein.
4. I/we have not been blacklisted or debarred from submitting, tenders by any Central or State Government Departments / Organizations.
5. The information furnished herein and the copies of documents submitted are correct and genuine to the best of my/our knowledge and belief and
6. I/we have not concealed or misrepresented any facts in connection with the documents submitted herewith and information furnished herein.
7. I/We have never been convicted for any criminal offence.

Date:

(Signature, name and designation of the authorized signatory)

(Name and seal of the Applicant)

Annexure C

PROJECT BACKGROUND, OBJECTIVE AND SPECIFICATION

PROJECT BACKGROUND & OBJECTIVES

The Madhya Pradesh State Agricultural Marketing Board (MPSAMB) hereby invites proposals from qualified and experienced EPC contractors for the design, supply, installation, integration, operation, and maintenance of a comprehensive Smart Information Broadcasting System across selected Agricultural Produce Market Committees (APMCs) throughout the state. This initiative represents a strategic investment in agricultural infrastructure aimed at transforming information dissemination to farming communities and market stakeholders.

The primary objective of this project is to establish a state-of-the-art communication platform that enables real-time information dissemination, dynamic data visualization, and efficient content broadcasting to all agricultural stakeholders including farmers, traders, commission agents, and APMC officials. The system should serve as a reliable channel for delivering government-validated information, market prices, weather updates, agricultural advisories, and scheme-related information in an accessible and timely manner.

This project envisions creating an integrated ecosystem that enhances market transparency, improves operational efficiency of APMCs, and empowers farmers with critical information for better decision-making. The system shall bridge the information gap between agricultural authorities and the farming community while supporting the state's digital agriculture initiatives and commitment to farmer welfare through technological innovation.

Key Objectives:

- Establish a state-of-the-art communication platform for real-time information dissemination
- Enhance market transparency and improve operational efficiency of APMCs
- Empower farmers with critical information for better decision-making
- Create an integrated ecosystem that supports digital agriculture initiatives
- Ensure reliable access to agricultural information across all stakeholder groups

1.2 BRIEF SCOPE OF WORK

The selected EPC Contractor shall assume single-point responsibility for delivering a complete turnkey solution encompassing the entire project lifecycle from initial design to

long-term operations and maintenance. The scope includes comprehensive system design and engineering services requiring detailed requirement analysis and preparation of a System Design Document (SDD) that outlines the complete architecture for data collection, content publishing, real-time broadcasting, and data visualization dashboards.
The supply and installation scope covers end-to-end procurement, delivery, installation, configuration, and commissioning of all hardware, software, and licenses necessary for a fully functional system. This includes Data Visualization Interfaces, content publishing and broadcasting software, display and communication devices, and integration with existing APMC infrastructure. The system deployment shall accommodate both outdoor installations exposed to weather elements and indoor installations within APMC buildings, with specific locations detailed in Annexure J.

The contractor shall deploy dedicated qualified technical manpower at designated APMCs and the central control room, with personnel responsibilities covering daily system operation and monitoring, content scheduling and publishing, first-level technical support and troubleshooting, and regular reporting to the Department. A comprehensive Operations and Maintenance (O&M) regime shall be established for the entire contract period, ensuring minimum 96% uptime for all systems and interfaces, regular data backup procedures, security patching, software updates, and dedicated helpdesk support.

The training and handover component requires conducting structured training sessions for department officials and APMC operators on system usage and content management, coupled with submission of complete documentation including user manuals, technical specifications, and maintenance procedures. The contractor shall facilitate smooth knowledge transfer to ensure departmental self-sufficiency in system operations.

The comprehensive scope includes:

A. System Design & Engineering

- Detailed requirement analysis and preparation of System Design Document (SDD)
- Design of complete architecture for data collection, content publishing, and real-time broadcasting
- Identification of all hardware, software, and network requirements

B. Supply, Installation & Commissioning

- Procurement and supply of all hardware, software, and licenses
- Installation at both outdoor (open to sky) and indoor (under roof) locations
- Configuration and commissioning of Data Visualization Interfaces and control systems

C. Architectural requirements:

- **Multi-Tier Architecture:** Presentation, Application, and Database layers separation
- **Load Balancing:** Automatic traffic distribution across servers
- **Auto-scaling:** Dynamic resource allocation based on demand
- **Microservices Architecture:** Modular, independently deployable services
- **API-First Design:** RESTful APIs for all integrations

D CCR capabilities:

- Real-time Monitoring: **Live status of all connected devices**
- Bulk Operations: **Simultaneous control of multiple devices**
- Role-based Access: **Different access levels for different users**
- Audit Trail: **Complete log of all operations**
- Alert Management: **Automated alerts for system anomalies**

EDGE FIELD DEVICE CONNECTIVITY

Next Generation Edge Field Device (NG-EFD) shall be provided as a unified network security, threat prevention, application visibility, encrypted traffic inspection, secure connectivity, analytics and SD-WAN enabled platform in a single integrated appliance architecture, designed for enterprise-grade perimeter and internal segmentation security deployment. The proposed Edge Field Device shall be rack-mountable in 1U form factor and shall support Layer 3 and Layer 4 security enforcement, NAT, VPN, Application Visibility and Control (AVC), User Identity integration, Next Generation Intrusion Prevention System (IPS), Zero Day Threat Protection, Advanced Malware Protection, Web Security Essentials, URL Filtering and DNS Filtering within a single unified architecture.

The Edge Field Device shall support inspection of TCP, UDP, HTTP/TCP and TCP/UDP traffic at packet sizes up to 1518 bytes and shall deliver minimum Threat Prevention Throughput of 750 Mbps under test conditions with all security features enabled. Real-world production throughput under test conditions shall not be less than 750 Mbps. The appliances shall support minimum 290,000 concurrent sessions and minimum 7,400 new sessions per second. TLS/SSL inspection and decryption throughput (DPI SSL) shall not be less than 240 Mbps. The device should support minimum four (4) GE Copper interfaces and minimum one (1) 1G SFP interface, with support for GE Copper and SFP interface types. It shall support minimum fifty (50) IPsec VPN peers for site-to-site connectivity, minimum five (5) IPsec VPN peers for client-to-site connectivity, and minimum five (5) SSL VPN peers for client-to-site connectivity. The Edge Field Device shall be based on X86 or better processing architecture and shall support High Availability in active-passive and active-active modes from day one, including stateful session failover without manual intervention.

The security architecture shall include firewall policy licensing (as applicable to Edge Field Device), Web Security Essentials / URL Filtering, IPS License, Application Visibility License, Advanced Persistent Threat (APT) License including Anti-Malware Protection, Command and Control (C&C) attack prevention, Geo-IP Protection, Zero Day Threat Protection, Gateway Anti-Virus and Gateway Anti-Spam capabilities. The system shall support not less than 10,000 NGIPS or DPI signatures and shall include Security Intelligence feeds covering IP, URL and Domain reputation. Certification shall comply with Common Criteria / NDPP / NSS / ICSA Labs as applicable. IPv6 readiness shall be supported from day one. The OEM shall provide minimum Two (2) years On-Site OEM Warranty.

The Edge Field Device shall support TLS 1.3 and Deep Packet SSL inspection to decrypt HTTPS traffic transparently for IPS, Gateway Antivirus, Content Filtering and Application Control scanning before forwarding clean traffic to destination. The system shall implement proxy-less and non-buffering inspection technology for DPI scanning without file or stream size limitation and shall apply to common protocols and raw TCP streams. The appliance shall inspect inbound, outbound and intra-zone traffic, scanning malware in files of unlimited length across all ports and TCP streams using Gateway Anti-Virus and Cloud AV engines. The proposed Edge Field Device shall support bi-directional raw TCP inspection scanning raw TCP streams on any port to prevent inbound and outbound threats. The system shall use a single-pass DPI architecture capable of simultaneous malware scanning, intrusion prevention and application identification ensuring correlated threat intelligence within unified inspection engine.

The solution should support granular URL category-based blocking with controls including Allow/Block, Bandwidth Management, Passphrase Override and Notify features. The URL database shall contain not less than fifteen (15) to twenty (20) million categorized sites across minimum ninety (90) categories. The integrated IPS shall scan packet payloads for vulnerabilities and exploits across broad attack spectrum and shall support minimum 20,000 IPS or DPI signatures and minimum 80 million Cloud AV signatures. The system shall allow granular content filtering using predefined or custom category combinations and shall support traffic shaping on a per-policy basis including guaranteed and maximum bandwidth definitions.

The Edge Field Device shall support both on-premises and cloud-based multi-engine sandboxing to prevent zero-day threats and shall support file analysis for executable programs (PE), DLL, PDFs, MS Office documents, archives, JAR, APK and multiple operating systems including Windows, Android, Mac OS X and multi-browser environments. The sandbox shall scan minimum 10MB file size per submission, process minimum 800 files per hour and support analysis of minimum 15 concurrent files. The system shall hold potentially malicious files at gateway until sandbox verdict is determined. The solution should detect and prevent cryptography-leveraged hidden attacks, encrypted malware downloads, C&C communications and data exfiltration. It shall provide protection against DoS and DDoS attacks using Layer 3 SYN proxy, Layer 2 SYN blacklisting, UDP/ICMP flood protection and connection rate limiting technologies.

The Edge Field Device shall support Zero-Touch registration and provisioning using mobile applications. It should provide real-time monitoring dashboards including graphical representation of top applications, top addresses, top users and intrusion sessions. GUI panels provide system status, usage statistics, network interface status, security services status and high availability state. The system should provide granular network topology visualization including host-level information and real-time infected host visibility, encrypted traffic visibility and observed threat intelligence. The centralized management platform shall be appliance-based or VM-based including log storage and analysis engines and shall support on-premises deployment with sufficient resource allocation. It shall support multi-device firmware upgrades, certificate management, global policy templates, multi-tenant management, device group management and centralized configuration push across multiple Edge Field Devices. The analytics platform shall support real-time risk monitoring and analysis of all network and user traffic within the ecosystem and shall support cloud-based configuration backup.

The solution shall support Wire Guard protocol to enable secure remote access for users from any device or network. The system shall provide full API support for management integration and SAML-based authentication. The Edge Field Device shall include integrated secure SD-WAN functionality enabling secure high-performance connectivity across remote sites using cost-effective internet services without requiring additional external hardware. If SD-WAN functionality is not natively integrated within the Edge Field Device, additional device provisioned from day one including required licenses shall be mandatory. The proposed solution shall comply with all above specifications simultaneously, and any deviation in throughput, DPI architecture, sandbox capability, SSL inspection, SD-WAN integration, management platform, signature.

HIGH-PERFORMANCE CONTROLLER

High-Performance SD-WAN Controller cum Next Generation Edge Security Gateway shall be provided as a unified, enterprise-class, 1U rack-mountable platform integrating advanced SD-WAN orchestration, secure connectivity, multi-gigabit threat prevention, encrypted traffic inspection, application intelligence, zero-day protection and centralized analytics within a single architecture. The proposed solution should function as an SD-WAN Controller by design, while inherently incorporating full Next Generation Firewall (NGFW) capabilities, without requiring external security appliances to enable core protection features.

The SD-WAN Controller cum Edge Security Gateway shall operate in 1U rack-mount form factor and shall support Layer 3 and Layer 4 network services including routing, NAT, VPN, Application Visibility and Control (AVC), User Identity integration, Next Generation Intrusion Prevention System (IPS), Advanced Malware Protection, Zero Day Threat Protection, Web Security Essentials including URL and DNS filtering, and encrypted traffic inspection as integral features.

The platform shall handle TCP, UDP, HTTP/TCP and TCP/UDP traffic at packet sizes up to 1518 bytes and shall deliver minimum Threat Prevention Throughput of 5000 Mbps with all security services enabled under test conditions. Real-world production throughput under test conditions shall not be less than 4000 Mbps. The appliance shall support minimum 2 million concurrent sessions and not less than 50,000 new sessions per second. TLS/SSL inspection and decryption throughput (DPI SSL) shall not be less than 1500 Mbps.

The solution should provide minimum sixteen (16) GE Copper interfaces and minimum three (3) 10G SFP+ interfaces. It shall support minimum 2000 IPsec VPN peers (Site-to-Site), minimum 1000 IPsec VPN peers (Client-to-Site) and minimum 500 SSL VPN peers (Client-to-Site). The device shall utilize X86 or better processing architecture and shall include minimum 256 GB internal storage (SSD or HDD) for log retention, analytics and reporting. Power architecture shall include dual power supplies with dual cooling fans for redundancy.

The SD-WAN Controller functionality shall enable secure, high-performance WAN connectivity across distributed sites using broadband, MPLS or hybrid links with dynamic path selection, application-aware routing and centralized orchestration. Secure SD-WAN shall be natively integrated within the appliance; vendors lacking native SD-WAN capability shall provide additional hardware from day one along with necessary licenses. All SD-WAN features shall be enabled from day one without future hardware dependency. The platform shall support active-passive and active-active high availability modes from day one with stateful session failover ensuring uninterrupted traffic flow in the event of hardware failure. Zero-Touch provisioning and mobile-app-based registration shall be supported.

The SD-WAN Controller cum Edge Security Gateway shall support TLS 1.3 and deep packet SSL inspection to decrypt HTTPS traffic transparently for IPS, Gateway Antivirus, Content Filtering and Application Control scanning. The architecture shall implement proxy-less, non-buffering inspection technology without file or stream size limitations and shall apply to raw TCP streams on any port. The system shall inspect inbound, outbound and intra-zone traffic for malware in files of unlimited size using Gateway AV and Cloud AV engines. The device shall implement single-pass DPI architecture capable of simultaneous malware scanning, intrusion prevention, and application identification within a correlated threat intelligence framework. It shall support not less than 10,000 NGIPS signatures and additionally support minimum 20,000 IPS/DPI signatures and minimum 80 million Cloud AV signatures. Security intelligence shall include IP, URL and Domain reputation feeds.

URL filtering shall support minimum 15–20 million categorized sites across not less than 90 categories, with granular control mechanisms including Allow, Block, Bandwidth Management, Passphrase Override and Notify functions. Granular content filtering and per-policy traffic shaping shall allow guaranteed and maximum bandwidth assignment for specific applications or networks. The solution shall support on-premises and cloud-based multi-engine sandboxing for zero-day threat detection, capable of analyzing executable programs (PE), DLL, PDF, MS Office documents, archives, JAR, APK files across Windows, Android, Mac OS X and multi-browser environments. The sandbox shall scan minimum 10

MB file size per submission, analyze minimum 800 files per hour and process minimum 15 concurrent files. Potentially malicious files shall be held at gateway until verdict determination.

The SD-WAN Controller cum Edge Security Gateway shall detect and prevent encrypted malware downloads, command and control communications and data exfiltration attempts. It shall protect against DDoS and DoS attacks using Layer 3 SYN proxy, Layer 2 SYN blacklisting, UDP/ICMP flood protection and connection rate limiting technologies.

The platform shall provide centralized management architecture (appliance or VM-based) including log storage, analytics and multi-tenant management. It shall support multi-device firmware upgrade, certificate management, global policy template push across devices, device group management, and centralized configuration control. Full API support for management integration and SAML-based authentication shall be supported. Cloud-based configuration backup shall be available. Real-time analytics shall provide graphical visualization of top applications, top users, top destinations, intrusion events and session insights. GUI dashboards shall provide health systems, interface statistics, security services status, HA state and network topology mapping with infected host visibility and encrypted traffic analysis. The analytics platform shall support real-time risk monitoring of all network and user traffic passing through the ecosystem.

The solution shall support Wire Guard protocol for secure remote user access from any device or network. Bidder shall Submitted OEM Authorization Along with Technical Compliance Conforming by OEMThe proposed SD-WAN Controller cum Edge Security Gateway shall support IPv6 readiness from day one and shall comply with Common Criteria / NDPP / ICSA Labs certifications including IPv6/USGv6 certifications. The TAC and R&D presence in India. 24x7x365 technical support via telephone, email and web shall be available. The solution offered shall be ICSA certified for Network Firewall and Common Criteria NDPP (Firewall) and shall confirm that the SD-WAN Controller includes full NGFW capabilities inherently within the architecture. Any deviation in throughput, DPI capability, sandbox performance, VPN capacity, SD-WAN integration, certification status, Bidder shall submitted OEM Authorization along with Technical Bid

Operational Capabilities:

- Remote scheduling, monitoring, and management of all content and display devices
- Real-time dashboard displaying system health, performance metrics, and operational status
- Emergency override functionality for instant broadcast of critical information across all devices
- Device synchronization mechanism to ensure uniform content display across multiple locations
- Bulk operations management for simultaneous control of multiple devices
- Real-time monitoring of all connected devices across APMCs with status updates

- Comprehensive device health status tracking including uptime, software versions, and connectivity
- Storage usage monitoring with auto-optimization features based on content size
- Network performance monitoring and bandwidth utilization tracking
- Automated alert system for device failures, connectivity issues, and performance degradation

Network design parameters

The Central Control Room will serve as the nerve centre for monitoring, managing, and controlling the entire information broadcasting network across all APMC locations. This facility, which may be established as a physical control room or virtual command centre, will provide comprehensive visibility and control over all system components, enabling efficient operations and quick response to emerging requirements. The CCR will be equipped with advanced monitoring tools and dashboards that display real-time status of all connected devices, content playback schedules, system performance metrics, and alert notifications.

The control room will enable authorized personnel to perform remote operations including content scheduling, device management, emergency broadcasts, and system configuration from a single centralized interface. It will feature role-based access control to ensure that different stakeholders have appropriate levels of access and control based on their responsibilities. The CCR will implement automated monitoring systems that continuously track device health, network connectivity, content delivery status, and system performance, generating alerts for any anomalies or failures that require attention.

Operational Capabilities:

- Remote scheduling, monitoring, and management of all content and display devices
- Real-time dashboard displaying system health, performance metrics, and operational status
- Emergency override functionality for instant broadcast of critical information across all devices
- Device synchronization mechanism to ensure uniform content display across multiple locations
- Bulk operations management for simultaneous control of multiple devices
- Real-time monitoring of all connected devices across APMCs with status updates
- Comprehensive device health status tracking including uptime, software versions, and connectivity
- Storage usage monitoring with auto-optimization features based on content size
- Network performance monitoring and bandwidth utilization tracking
- Automated alert system for device failures, connectivity issues, and performance degradation

FILD EDGE DEVICE

Physical Design and Construction The media player unit shall feature a compact set-top box design with professional-grade construction suitable for commercial deployments. The enclosure shall be constructed from durable ABS plastic material with adequate ventilation systems to ensure optimal thermal management during continuous operation. The physical dimensions shall not exceed 180mm in width, 180mm in depth, and 35mm in height, designed for discrete placement behind displays or wall-mounted installations. The unit must maintain structural integrity and performance stability under continuous 24/7 operational requirements. Processing and Computational Capabilities The media player shall be equipped with a quad-core ARM Cortex-A53 processor architecture operating at a minimum clock speed of 1.5GHz. The system must incorporate a Mali-450 MP4 graphics processing unit capable of handling 4K video decoding and rendering. The device shall include minimum 2GB DDR3 system memory to ensure smooth multitasking and application performance. Internal storage capacity must be at least 8GB eMMC flash memory with provisions for expandable storage through external interfaces. The platform shall operate on Android 7.0 Nougat operating system or higher with enterprise-grade management capabilities.

Video Output and Display Performance The media player must support HDMI 1.4b output specification with capability to deliver up to 4K Ultra HD resolution (3840x2160 pixels) at 30Hz refresh rate. The device shall provide comprehensive video format support including MPEG-2, MPEG-4, H.264, H.265/HEVC, VC-1, VP8, and VP9 codecs. The unit must feature advanced video processing capabilities including auto-resolution switching, multiple aspect ratio support, and high dynamic range (HDR) compatibility. Color depth support must include both 8-bit and 10-bit color processing for accurate color reproduction across various display technologies. Audio Processing and Output Capabilities The media player shall provide high-quality audio output through HDMI digital audio and S/PDIF optical audio interfaces. The device must support comprehensive audio formats including MP3, WMA, AAC, FLAC, ALAC, and WAV. Advanced audio capabilities must include support for Dolby Digital, Dolby Digital Plus, and DTS surround sound technologies. The system shall be capable of delivering both stereo and 5.1 channel surround sound output, ensuring compatibility with various audio systems and speaker configurations in commercial environments. Wired Connectivity Interfaces The media player must include a 10/100 Mbps RJ45 Ethernet port for reliable wired network connectivity. The device shall be equipped with multiple USB 2.0 ports for peripheral connectivity and external storage expansion. Primary video output must be provided through a standard HDMI 1.4b connector with support for contemporary display technologies. All physical interfaces must comply with industry standards and maintain secure connections during continuous commercial operation.

Wireless Communication Capabilities The media player shall incorporate dual-band 802.11 b/g/n/ac Wi-Fi technology supporting both 2.4GHz and 5GHz frequency bands for flexible network deployment. The device must include Bluetooth 4.1 technology with BLE (Bluetooth Low Energy) support for peripheral device connectivity. Integrated 4G LTE modem capability with VoLTE support must be included for deployments requiring cellular network connectivity. All wireless modules must maintain stable connections and consistent performance in commercial environments with multiple connected devices. Power Management and Electrical Specifications The media player must operate on 12V DC power input with compatible power adapter provisions. Power consumption during normal operation shall not exceed 12 watts, with standby power consumption maintained below 1 watt. The power supply system must support universal input voltage range of 100-240V AC for global deployment compatibility. Power management features must include over-current protection, over-voltage protection, and thermal protection mechanisms to ensure device safety and longevity.

Digital Signage Management Capabilities The media player must support integration with cloud-based digital signage management platforms for centralized device control and content management. The system shall provide automated content scheduling capabilities with sophisticated playlist management and priority-based content playback. Local content caching functionality must be included to ensure continuous operation during network connectivity interruptions. Comprehensive device monitoring features must encompass real-time health monitoring, performance metrics tracking, and automated alert generation for maintenance requirements.

Security and System Protection The media player must implement secure boot technology to prevent unauthorized system modifications and ensure firmware integrity. Encrypted storage capabilities must be provided for sensitive data protection and access credential security. Remote device lockdown features must be available for security-sensitive deployments and access control scenarios. Firmware update verification mechanisms must be incorporated to ensure only authenticated software updates are installed on the device Environmental Operating Conditions The media player must maintain operational stability within temperature ranges of 0°C to 40°C ambient conditions. Storage temperature tolerance must range from -20°C to 70°C without performance degradation. The device shall operate reliably in relative humidity conditions ranging from 5% to 90% non-condensing environments. All components must be rated for continuous commercial operation with adequate thermal management to prevent overheating during extended usage periods. Hardware Interface Configuration The media player front panel must include an infrared receiver sensor compatible with standard remote-control systems and an LED status indicator for operational status monitoring. Rear panel connectivity must comprise HDMI 1.4b output, S/PDIF optical audio output, multiple USB 2.0 ports, 10/100 Mbps Ethernet port, DC power input jack, and a recessed reset button for system recovery. All interface placements must facilitate easy access while maintaining clean installation aesthetics.

Reliability and Performance Metrics The media player must demonstrate Mean Time Between Failures (MTBF) exceeding 30,000 hours under normal operating conditions. The device design must support 24/7 continuous operation without performance degradation or system instability. Boot time from cold start must not exceed 45 seconds, with instant content switching capabilities between scheduled playlists. Network performance must maintain stable streaming capabilities up to 4K resolution with appropriate bandwidth availability, supporting simultaneous operation of multiple applications and services. Compatibility and Integration Standards The media player must maintain compatibility with all HDMI-enabled display technologies including contemporary LCD, LED, OLED displays, and projection systems. Support for various display aspect ratios including 16:9, 4:3, and 21:9 must be provided with automatic detection and adjustment capabilities. The device must support major digital signage content formats including HTML5, JavaScript, and web-based content rendering. Live streaming protocol support must include RTMP and HLS standards for real-time content delivery and broadcast applications.

DATA VISUALIZATION INTERFACE - TYPE A

The bidder shall supply, install, integrate, test and commission a factory-manufactured, fully active direct-view LED Display System having a minimum active viewing dimension of approximately 2880 mm (W) × 1920 mm (H), forming a seamless unified display surface with total native pixel resolution not less than 432 × 288 pixels. The system shall be based on precision-engineered modular die-cast cabinet architecture fabricated exclusively from magnesium alloy or high-grade aluminum alloy for structural rigidity, thermal stability and dimensional accuracy. Fabricated sheet metal enclosures, plastic frames, hybrid composite cabinets, refurbished modules, mixed-generation panels, or assembled third-party integration shall not be accepted. Weight per square meter shall not exceed 23 kg to ensure structural compliance.

Pixel pitch shall be 6.67 mm or lower (better), provided minimum resolution criteria are maintained. Pixel configuration shall be SMD 3-in-1 LED package with pixel density not less than 22,500 pixels per square meter. Optical performance shall demonstrate minimum calibrated brightness of 6000 nits measured under standardized luminance test conditions using calibrated photometric instruments. Brightness uniformity shall not be less than 97% across the entire display surface. Contrast ratio shall not be less than 15,000:1. Horizontal viewing angle shall be minimum 160 degrees and vertical viewing angle minimum 140 degrees without chromatic distortion. Color temperature shall be adjustable within approximately 3200K to 9300K. Processing depth shall be minimum 14-bit and expandable up to 16-bit or higher. Refresh rate shall not be less than 3840 Hz ensuring scan-line free broadcast compatibility.

The system shall operate within temperature range not higher than minus 20°C and not lower than plus 50°C and humidity range of 10% to 90% non-condensing. Both front and rear surfaces shall be minimum IP66 rated without dependence on external enclosures. LED operational lifetime shall not be less than 100,000 hours under nominal duty cycle. Power architecture shall support universal 100–240V AC input with maximum power consumption not exceeding 650 W per square meter. Each LED cabinet shall carry BIS registration, UL or ETL certification, IEC 60950 or CB Scheme compliance, FCC compliance, EMC compliance and BS476 Part 7 Class 1 fire performance certification. All cabinets shall be traceable to OEM global website listings at the time of bid submission.

The LED Controller and Video Processor shall be of identical OEM make as LED cabinets. Third-party processing equipment shall not be permitted. The controller shall support minimum HDMI and DisplayPort inputs, integrated OPS slot architecture, minimum 16 LAN output ports, RS232 loop control, ambient light sensor interface, temperature monitoring, chroma calibration, brightness control, HDR processing, scaling functionality, and original OEM LED configuration software. It shall support minimum 3840 × 2160 @ 60Hz input

resolution with output pixel capacity not less than 8.2 million pixels. The processor shall support multi-window PBP/PIP configuration

up to four simultaneous inputs, flexible layout mapping, automatic signal failover, built-in operating system with minimum 8GB internal memory, Wi-Fi connectivity, local key interface and IR remote. Integrated signage capability shall allow multi-zone division, HDMI input overlay, URL/stream playback, video scheduling, map-based location tagging, multi-user hierarchical role control (administrator, supervisor, operator), playlist approval workflow, grouping of players, scheduling engine and one-time licensed activation.

The LED display system shall be integrated with a lithium-based advanced cylindrical cell energy storage and inverter module rated minimum 5.2 kWh total capacity with usable depth of discharge up to 90%, nominal 48V DC architecture, 3kW pure sine output at 220V 50Hz, AC input range 170–270V, PV input capability up to 5kW, IP67-rated enclosure fabricated from reinforced sheet metal and polymer composite with spill-resistant design, operating temperature 0–45°C, fast charging capability approximately 1.5 hours (configurable), WiFi and 4G enabled monitoring, application-based appliance scheduling, real-time energy analytics, multi-mode load management, silent fan-less acoustic profile and compliance to BIS and AIS 156 battery safety standards. The backup system shall be engineered to support continuous LED operation for not less than 120 minutes at nominal operating load.

OEM eligibility conditions applicable strictly to LED display, controller and processor ecosystem shall require minimum 10 years registered presence in India, valid GST and PF registration, ISO 9001, ISO 14001 and ISO 45001 certifications, operational branch office, service center and warehouse within the State for minimum five years, LED chip repair facility with toll-free service logging system for minimum ten years, annual turnover not less than INR 500 Crore for each of financial years 2023, 2024 and 2025 supported by CA-certified statements, and documented execution of minimum ten Government LED display installations within last two financial years. The Employer reserves the right to physically verify factory, warehouse, service center, calibration tools, luminance measurement instruments and production capability prior to order placement. Any deviation between declared technical parameters and official OEM datasheet shall render the bid technically non-responsive without further clarification. Laboratory verification of brightness, IP rating, cabinet material composition and pixel pitch accuracy may be conducted, and results shall be final and binding.

DATA VISUALIZATION INTERFACE - TYPE B

Display Specifications and Visual Performance The commercial display shall feature a 65-inch diagonal screen size with professional-grade panel technology suitable for continuous commercial operation. The display must utilize an LED backlighting system with direct-lit or edge-lit configuration capable of maintaining consistent brightness levels across the entire

viewing area. Native resolution shall be 3840 x 2160 pixels (4K Ultra HD) with support for various input signal formats including 1080p, 1080i, 720p, and 480p. The panel must deliver a minimum brightness of 500 nits for adequate visibility in well-lit commercial environments, with a static contrast ratio of at least 4000:1 and dynamic contrast ratio exceeding 1,000,000:1. Viewing Angle and Colour Performance The display shall provide wide viewing angles of 178 degrees both horizontally and vertically without significant colour shift or contrast degradation. Colour gamut coverage must meet or exceed 90% of NTSC standard, with 10-bit colour processing capability for smooth colour gradients. The display must support advanced colour management features including individual RGB colour adjustment, colour temperature control, and gamma correction settings. Professional colour calibration capabilities must be included to ensure colour accuracy and consistency across multiple display installations.

Durability and Commercial Reliability The display unit must be specifically engineered for 24/7 continuous operation with reinforced components and enhanced thermal management systems. Mean Time Between Failures (MTBF) must exceed 50,000 hours under normal operating conditions. The display panel must incorporate anti-image retention technology and pixel shifting features to prevent burn-in during extended static content display. All internal components must be rated for commercial usage with protection against power surges, voltage fluctuations, and environmental stress. Connectivity and Input Interfaces The display must be equipped with comprehensive input interfaces including minimum three HDMI 2.0 ports supporting 4K resolution at 60Hz refresh rate.

Additional connectivity must include DisplayPort 1.2, D-Sub VGA input, composite video input, and component video input. USB connectivity must include multiple USB 2.0 and USB 3.0 ports for media playback and service functions. Network connectivity must feature built-in RJ45 Ethernet port with support for 10/100 Mbps network speeds. Integrated wireless connectivity must include dual-band Wi-Fi 802.11 a/b/g/n/ac and Bluetooth 4.2 or higher for peripheral device connections. Control and Management Capabilities The display must support RS-232C serial control for integration with building management systems and centralized control systems. Network control protocols must include TCP/IP with support for SNMP monitoring and management. The display must be compatible with major digital signage management platforms for remote control, scheduling, and content management. Integrated IR remote control receiver must be provided along with support for IP-based control applications for mobile devices and computers. Audio Performance and Output The display must include built-in stereo speakers with minimum 20W total output power (10W + 10W) capable of delivering clear audio in commercial environments. Audio connectivity must include stereo audio output (RCA or 3.5mm jack), digital audio output (optical), and audio input options matching video input sources. Advanced audio features must include equalizer settings, volume normalization, and audio delay adjustment for synchronization with external audio systems. Power Requirements and Energy Efficiency The display must operate on universal AC power input from 100-240V at 50/60Hz for global deployment compatibility. Typical power consumption must not exceed 200 watts during normal

operation, with energy-saving modes reducing consumption to below 0.5 watts in standby mode.

The display must incorporate automatic brightness sensors that adjust screen brightness based on ambient light conditions to optimize energy usage. Power management features must include scheduled on/off timers, motion sensor compatibility, and remote power control capabilities. Physical Construction and Installation The display enclosure must be constructed from reinforced materials with minimal bezel design, featuring borderless or ultra-narrow bezels not exceeding 10mm on all sides. The display must support standard VESA mount patterns (600x400mm) for wall mounting, ceiling mounting, and integration with various display stands and trolleys. Overall dimensions must be optimized for the 65-inch panel size with consideration for ventilation requirements and service access. The display weight must not exceed 40kg without stand to facilitate safe installation and mounting.

Environmental Specifications Operating temperature range must be maintained from 0°C to 40°C with relative humidity tolerance from 10% to 80% non-condensing. Storage temperature tolerance must range from -20°C to 60°C with proper packaging. The display must be designed to withstand typical commercial environment conditions including dust exposure, minor vibrations, and electromagnetic interference. All materials must comply with fire safety standards and environmental regulations for commercial electronic equipment. Smart Features and Digital Signage Capabilities The display must include integrated media player functionality capable of playing content from USB storage devices in various formats including JPEG, PNG, MP4, AVI, and PDF. Scheduled playback features must allow for time-based and date-based content rotation without external control systems. Multi-zone display capability must be supported, enabling simultaneous display of multiple content sources in divided screen layouts. Support for HTML5 content, web pages, and interactive applications must be included for advanced digital signage implementations.

Safety and Regulatory Compliance The display must carry CE marking indicating compliance with European health, safety, and environmental protection standards. RoHS compliance must be demonstrated for restriction of hazardous substances in manufacturing. Energy Star certification or equivalent energy efficiency rating must be provided. For Indian market deployment, the display must possess valid BIS certification and comply with relevant Bureau of Indian Standards for safety and performance. Warranty and Support Requirements The manufacturer must provide minimum two-year commercial warranty covering parts and labour for all components. Extended warranty options must be available for critical installations requiring additional coverage.

Technical support must include remote troubleshooting capabilities and prompt onsite service response for commercial clients. Replacement unit programs must be available for mission-critical applications requiring maximum uptime assurance. Accessory Compatibility and Integration The display must be compatible with various professional accessories including security locks, protective screens, and environmental protection

covers. These specifications define the minimum requirements for a 65-inch commercial display suitable for digital signage, corporate communications, retail advertising, and public information display applications in commercial environments requiring reliable 24/7 operation.

Network SWITCH

GENERAL REQUIREMENTS The bidder shall supply and install industrial-grade managed Ethernet switches featuring integrated GPS synchronization capabilities designed for critical infrastructure, transportation systems, and time-sensitive network applications. The switches shall provide precise timing synchronization, robust environmental tolerance, and comprehensive management features suitable for deployment in harsh industrial environments requiring reliable, deterministic network performance.

Ethernet Port The switch shall provide eight (8) 10/100/1000BASE-T Gigabit Ethernet ports compliant with IEEE 802.3/802.3u/802.3ab standards, supporting auto-negotiation and auto-MDI/MDIX functionality. All copper ports shall include surge protection rated at minimum 6KV for both differential and common mode protection, with isolation voltage exceeding 1500V RMS. Port configuration shall support individual speed and duplex mode configuration with link aggregation capability for bandwidth aggregation and redundancy.

Fiber Optic Connectivity The switch shall include two (2) 100/1000BASE-X SFP (Small Form-factor Pluggable) fiber optic ports supporting single-mode and multimode transceivers with transmission distances up to 80km for single-mode applications. SFP ports shall support hot-swap capability for maintenance without system disruption and automatic detection of installed transceiver type with corresponding speed configuration. Fiber optic interfaces shall include link fault indication and remote fault signaling capabilities. Console and Management Ports The switch shall provide one (1) RS-232 serial console port using RJ45 connector for out-of-band management, supporting standard serial communication parameters (9600-115200 baud, 8 data bits, 1 stop bit, no parity). Additionally, the switch shall include one (1) 10/100BASE-T Ethernet management port with dedicated IP addressing for separate management network access. All management interfaces shall support secure access protocols including SSH and HTTPS with encrypted communication.

GPS Receiver The switch shall incorporate an integrated GPS receiver module supporting multiple satellite constellations including GPS (USA), GLONASS (Russia), BeiDou (China), and Galileo (Europe) for improved accuracy and reliability. The receiver shall maintain minimum tracking capability of 20 satellites simultaneously with positioning accuracy better than 2.5 meters CEP (Circular Error Probable). Time to first fix (TTFF) shall be less than 45 seconds for cold start and less than 30 seconds for warm start under clear sky conditions. Timing Synchronization Protocols The switch shall support comprehensive timing synchronization protocols including IEEE 1588v2 (Precision Time Protocol) with hardware timestamping accuracy better than 50 nanoseconds. The system shall function as both boundary clock and transparent clock with support for multiple PTP profiles including Default, Power Utility, and Telecom profiles. Additionally, the switch shall support Network

Time Protocol (NTP) and Simple Network Time Protocol (SNTP) with stratum 1 capability when synchronized to GPS.

Timing Output and Distribution The switch shall provide configurable timing outputs including 1 Pulse Per Second (1PPS) with TTL/CMOS level outputs and time-of-day serial messages via RS-232/RS-422 interfaces. Timing accuracy shall be maintained with holdover capability of less than 1 microsecond per day when GPS signal is lost. The system shall include comprehensive monitoring of GPS signal quality, satellite status, and timing performance with configurable alarms for synchronization loss or degradation. Switching Architecture, the switch shall incorporate a non-blocking switching fabric with total throughput capacity of 20 Gbps and forwarding rate of 14.88 million packets per second. The switching architecture shall support store-and-forward switching with wire-speed performance on all ports simultaneously under full load conditions. Packet buffer memory shall be sufficient to handle traffic bursts exceeding 4MB with configurable buffer management policies.

MAC Address Capacity The switch shall support a minimum of 8K MAC address entries with automatic learning and aging functionality. MAC address table management shall include static MAC address configuration, MAC address filtering, and port security features limiting the number of MAC addresses per port. The switch shall implement MAC-based VLAN assignment and MAC notification traps for security monitoring. Operating Conditions The switch shall operate reliably across extended temperature ranges from -40°C to +75°C without performance degradation or required derating. The device shall maintain operation in relative humidity conditions from 5% to 95% non-condensing with protection against corrosive environments. The enclosure shall provide IP40 protection rating against solid foreign objects with appropriate ventilation for thermal management in enclosed installations.

Mechanical Construction The switch enclosure shall be constructed from heavy-duty industrial-grade metal with corrosion-resistant coating suitable for harsh environments. The device shall support DIN-rail mounting according to EN 60715 standard with additional wall-mounting capability using provided mounting brackets. Physical dimensions shall be optimized for industrial cabinet installations with consideration for cable management and service access. Vibration and Shock Resistance The switch shall withstand mechanical vibration up to 5Grms (5-500Hz) and operational shock up to 50G according to IEC 60068-2-27 standards. Transportation shock resistance shall exceed 100G to ensure survival during handling and shipping. All internal components shall be secured with appropriate fastening methods to prevent dislocation during vibration or shock events.

Power Input Options The switch shall support dual redundant power inputs accepting wide voltage ranges from 12VDC to 48VDC with polarity reversal protection and overload protection. The power supply shall include integrated surge protection meeting IEEE C62.41 standards with protection levels appropriate for industrial environments. Power consumption shall not exceed 15 watts under normal operating conditions with energy-efficient design for continuous operation. Power over Ethernet Capability The switch shall

support Power over Ethernet (PoE) functionality on designated ports compliant with IEEE 802.3at (PoE+) standard, providing up to 30 watts per port with total PoE budget configurable based on available power supply. PoE management shall include per-port power monitoring, priority-based power allocation, and automatic power reset for faulty devices. The system shall provide comprehensive PoE status monitoring and reporting through management interfaces.

Management Protocols The switch shall support comprehensive management protocols including SNMP (v1/v2c/v3), RMON (1,2,3,9), LLDP, and sFlow for network monitoring and management. Command Line Interface (CLI) access shall be available through console port, Telnet, and SSH with hierarchical command structure and context-sensitive help. Web-based management shall utilize HTTPS with modern browser compatibility and responsive design for mobile access. Configuration and Monitoring Features The switch shall provide comprehensive configuration capabilities including VLAN management (802.1Q with support for 4K VLANs), Quality of Service (802.1p with 8 priority queues), port mirroring (SPAN/RSPAN), and link aggregation (802.3ad with up to 8 groups). Real-time monitoring shall include port statistics, error counters, temperature monitoring, and power supply status with configurable thresholds and alarm notifications.

Network Security The switch shall implement comprehensive security features including port security with MAC address limiting, 802.1X port-based authentication with multiple supplicant support, and RADIUS/TACACS+ integration for centralized authentication. Access Control Lists (ACLs) shall support both MAC-based and IP-based filtering with configurable action rules. The system shall include protection against common network attacks including broadcast storm control, DHCP snooping, and IP Source Guard. Management Security Management access shall be secured through multiple authentication methods including local user database, RADIUS, and TACACS+ with role-based access control defining different privilege levels. All management communications shall support encryption using SSH (for CLI) and HTTPS/TLS (for web interface) with configurable cipher suites and certificate management. Audit logging shall capture all configuration changes and security events with remote syslog support.

Network Redundancy The switch shall support multiple network redundancy protocols including Rapid Spanning Tree Protocol (RSTP), Multiple Spanning Tree Protocol (MSTP), and proprietary ring protocols with recovery times less than 50 milliseconds. The device shall include dual image storage with independent configuration files for firmware upgrade reliability and rollback capability. Watchdog timer functionality shall ensure automatic recovery from software lockup conditions. Power and System Redundancy Dual power inputs shall support load sharing and automatic failover with monitoring of individual power supply status. The switch shall include internal temperature monitoring with automatic fan speed adjustment and over-temperature protection. System reliability shall be validated through extensive burn-in testing with documented Mean Time Between Failure (MTBF) exceeding 200,000 hours under normal operating conditions.

The switch shall carry comprehensive industry certifications including CE marking for European market, FCC Part 15 for United States, and RoHS compliance for environmental standards. Specific industrial certifications shall include UL/cUL Class 1 Division 2 for hazardous locations, IEC 61850-3 for electrical utility applications, and IEEE 1613 for electrical substation environments. The manufacturer shall provide complete certification documentation and test reports confirming compliance with specified standards.

IP65 OUTDOOR RACK

Installation and commissioning the supplier shall provide complete installation services including site survey, network design consultation, equipment installation, and system commissioning. Installation shall include proper grounding procedures, cable management, and environmental verification to ensure optimal performance. Commissioning shall include comprehensive testing of all switch functions, GPS synchronization verification, and performance validation under simulated load conditions. warranty and support the switch shall be covered by minimum Two-year manufacturer warranty including advance hardware replacement with expedited shipping options. Technical support shall include firmware updates, security patches, and compatibility updates for the supported product lifecycle. The manufacturer shall provide comprehensive documentation including installation guides, configuration manuals, and application notes specific to GPS-synchronized network deployments. Training services shall be available for network administrators covering advanced features and troubleshooting procedures.

The Outdoor Equipment Enclosure / Rack shall be constructed using folded galvanized steel (GI) sheet forming a rigid and structurally reinforced frame, fully welded to ensure mechanical integrity and long-term dimensional stability. The top and bottom covers shall be factory-welded GI panels integrated with the main frame to enhance structural strength and environmental sealing. The front door shall be provided either as a lockable plain GI door or lockable toughened glass GI door as required, with proper gasket sealing arrangement to maintain ingress protection. The enclosure shall support standard 19” equipment mounting architecture and shall conform to DIN 41494 or equivalent EIA / ISO / EN / CEA standards.

The rack shall be 9U configuration with approximate external dimensions of 600 mm (W) × 600 mm (D), and usable mounting depth of minimum 451 mm with adjustable mounting depth feature. Four (4) adjustable 19” vertical mounting rails shall be provided, punched with 10 mm square holes and universal 12.7 mm – 15.875 mm – 15.875 mm alternating hole pattern to maximize mounting flexibility and equipment compatibility. Equipment mounting shall support DIN standard 10 mm square slots. The enclosure shall be polyester powder coated with dual-coat outdoor-grade finish meeting ASTM standards, suitable for harsh outdoor conditions. Standard color should be Off-White or Black. OEM Authorization must be submitted along with technical bid with compliances

The enclosure shall provide protection class IP56 (with fan) and IP66 (without fan) as per IEC 60529 or equivalent standards. Static load capacity shall be minimum 50 kg uniformly distributed. Provision for grounding and bonding shall be incorporated through dedicated

earthing studs and bonding points to ensure safe dissipation of fault current and static charges, maintaining electrical continuity between door, panels, and frame.

HORN SPEAKER

GENERAL REQUIREMENTS The bidder shall supply and install IP-based horn speakers with integrated microphone capability designed for network audio applications in indoor and outdoor environments. The devices should provide high-quality audio reproduction, two-way communication, and network-based control suitable for public address, emergency notification, and intercom applications. All components must be designed for reliable operation in various environmental conditions with comprehensive network management capabilities. Speaker Output Characteristics The horn speaker shall deliver 15 watts RMS power output with peak power handling of 30 watts, featuring a nominal impedance of 8 ohms. Frequency response shall range from 250Hz to 15,000Hz (±3dB) with optimized response for voice intelligibility in the critical 500Hz to 4,000Hz range. Sound pressure level shall achieve minimum 110dB at 1 meter distance when driven at rated power, with dispersion pattern of 120° horizontal by 60° vertical for wide coverage area.

Microphone The integrated microphone shall feature omnidirectional pickup pattern with frequency response from 100Hz to 10,000Hz and sensitivity of -45dB ±3dB (0dB=1V/Pa at 1kHz). The microphone system should include automatic gain control with adjustable settings, noise cancellation technology, and echo suppression for clear two-way communication. Talk-back functionality shall support full-duplex operation with seamless transition between receive and transmit modes. Network Interface The device shall include one 10/100 Mbps Ethernet port with RJ45 connector supporting Power over Ethernet (PoE) compliant with IEEE 802.3af standard (Class 3). Network connectivity shall support both static IP addressing and DHCP with automatic fallback to APIPA (169.254.x.x) addressing if DHCP is unavailable. The device should maintain network connectivity through automatic reconnection mechanisms with configurable retry intervals.

Audio Streaming Protocols The speaker shall support multiple audio streaming protocols including RTP/RTCP for real-time audio transmission, RTSP for media control, and SIP for voice communication sessions. Codec support shall include G.711 (A-law/μ-law), G.722 (wideband), AAC-LC, and MP3 for music playback with automatic codec negotiation based on network conditions. Audio streaming shall support configurable bit rates from 8kbps to 320kbps with adaptive bit rate adjustment for varying network conditions. Enclosure and Materials The speaker enclosure shall be constructed from UV-resistant ABS plastic with IP66 protection rating, providing complete protection against dust ingress and powerful water jets from any direction. The housing shall include integrated mounting bracket with 360° rotation capability and tilt adjustment of ±30° for directional positioning. All external fasteners shall be stainless steel to prevent corrosion in outdoor environments.

Environmental Tolerance The device shall operate reliably across temperature ranges from -30°C to +60°C with humidity tolerance from 10% to 90% non-condensing. The speaker components shall be rated for continuous outdoor exposure with protection against UV

degradation, salt spray, and industrial pollutants. Internal components shall be protected against thermal stress with appropriate ventilation and thermal management design. Physical Dimensions and Weight The overall dimensions shall not exceed 250mm in height, 200mm in width, and 180mm in depth, with weight not exceeding 2.5kg including all mounting hardware. The horn design shall optimize acoustic projection while maintaining compact form factor suitable for various mounting locations including ceilings, walls, and poles.

Power over Ethernet Operation The device shall operate exclusively via Power over Ethernet, drawing maximum 15 watts under full audio output conditions with typical consumption of 8 watts during standby. PoE compatibility shall include detection and classification according to IEEE 802.3af standards with automatic power management to prevent overloading of PoE switches. The device shall include power conditioning and surge protection meeting IEEE C62.41 standards for electrical protection. Power Monitoring and Management Integrated power monitoring shall track consumption levels with reporting capability through management interfaces. The device shall implement power-saving features including automatic sleep mode during periods of inactivity with configurable wake-up triggers. Power status indicators shall provide visual indication of power receipt and operational status.

Configuration and Control The device shall provide web-based configuration interface accessible via standard web browsers with support for multiple user accounts and role-based access control. Configuration parameters shall include network settings, audio parameters, volume control, equalization settings, and operational schedules. Bulk configuration capabilities shall support simultaneous configuration of multiple devices through template-based deployment. Monitoring and Diagnostics Real-time monitoring shall include audio level meters, network statistics, device temperature, and power consumption data. Diagnostic capabilities shall include audio loopback testing, network connectivity testing, and microphone/speaker self-test functions. Event logging shall capture operational events, configuration changes, and system errors with remote syslog support for centralized log management.

Digital Signal Processing The device shall incorporate digital signal processor with configurable equalization presets including voice optimization, music enhancement, and custom user-defined profiles. Audio processing features shall include dynamic range compression, automatic volume levelling, and frequency-selective limiting to prevent distortion. Advanced algorithms shall provide acoustic feedback suppression and ambient noise adaptation for varying environmental conditions. Audio Source Management Multiple audio source support shall include network audio streams, local microphone input, and optional line-in connectivity through auxiliary ports. Audio mixing capabilities shall allow simultaneous playback of multiple sources with independent volume control and priority-based mixing. Source selection shall support manual control, scheduled switching, and event-triggered source changes.

Network Security The device shall support network security features including 802.1X authentication, MAC address filtering, and IP address whitelisting. Communication security shall include support for HTTPS for web management, TLS for encrypted audio streams, and SRTP for secure real-time audio transmission. Firmware validation shall include digital signature verification to prevent unauthorized firmware installation. Physical Security The enclosure shall include tamper-resistant design with security screw options and intrusion detection capability. Mounting hardware shall prevent unauthorized removal with optional security brackets and anti-theft fasteners. Physical security features shall be integrated with monitoring systems to trigger alerts upon tampering attempts.

Public Address System Integration The speaker shall integrate seamlessly with standard IP-based public address systems supporting common management platforms and control software. Compatibility shall include support for major public address protocols and management systems with documented integration procedures. The device shall support third-party control systems through open API interfaces with comprehensive documentation. Emergency Notification Integration with emergency notification systems shall include support for contact closure inputs for trigger activation, network-based alert protocols, and synchronization with visual warning devices. The device shall support priority override functionality for emergency announcements with configurable pre-alert tones and message repetition settings.

Mounting and Installation The device shall include comprehensive mounting hardware for various installation scenarios including wall mounting, pole mounting, and ceiling mounting with appropriate brackets and fasteners. Cable management shall include integrated cable channels and weatherproof cable glands for power and network connections. Installation documentation shall include acoustic positioning guidelines for optimal coverage and intelligibility. Commissioning and Testing Commissioning procedures shall include acoustic performance testing with sound level measurements, network connectivity verification, and functional testing of all features. Audio quality validation shall include intelligibility testing using standardized speech transmission index measurements. Network integration testing shall verify proper operation within the existing network infrastructure with appropriate quality of service configurations.

RACK SERVER

General requirements the bidder shall supply and install enterprise-grade 1U rack servers designed to meet specific requirements for medium-duty workloads while providing enterprise-class performance and capabilities. The servers shall be optimized for data centre deployment with comprehensive management features, robust security, and high reliability for continuous operation in mission-critical environments. Processor specifications the server shall support up to two third-generation Intel Xeon Scalable processors with up to 32 cores per processor. The processor architecture shall be designed for enterprise workloads with advanced performance, security, and reliability features. The system must support the full feature set of the processor family including all instruction set

extensions and hardware acceleration capabilities for virtualization, encryption, and data processing workloads.

Memory configuration the server shall provide 16 DDR4 DIMM slots supporting registered ECC DDR4 DIMMs exclusively. The maximum memory capacity shall be 1 terabyte with memory speeds up to 3200 MT/s. The memory architecture must support advanced error correction and memory mirroring capabilities for mission-critical applications. All memory modules shall be hot-pluggable with proper system support for online maintenance and expansion.Storage Controllers The server shall offer multiple storage controller options including internal RAID controllers supporting various configurations including basic RAID functionality and advanced hardware RAID with cache protection. External RAID expansion shall be supported through dedicated external storage controllers. Internal boot options shall include dual SD card modules or dedicated boot-optimized storage subsystems with hardware RAID support for multiple M.2 SSDs or USB boot devices for flexible deployment scenarios.

Drive Bay Configuration The server's front drive bay configuration shall support multiple flexible arrangements including capacity-optimized setups with large-form-factor drives for maximum storage density or performance-optimized configurations with numerous small-form-factor drives, including support for high-speed NVMe technology. The system shall additionally provide rear drive bays for dedicated boot drives, caching devices, or additional storage expansion, with all drive bays supporting hot-swap capability for maintenance without system downtime and accommodating both traditional hard disk drives and solid-state drives across various interface protocols.

Power Supply System The server shall offer multiple redundant hot-swappable power supply options with varying wattages to accommodate different system configurations and load requirements, featuring high-efficiency ratings including Platinum and Titanium certifications that support mixed-mode operation with both alternating current and direct current inputs, while dedicated DC models shall be available for telecommunications and specialized deployments requiring specific power input characteristics. Cooling and Thermal Management The server shall utilize an advanced air cooling methodology with multiple fan options ranging from standard to high-performance variants, supporting up to seven independently controlled fans with intelligent thermal management that dynamically adjusts cooling based on real-time system load, component temperatures, and environmental conditions, with all cooling components designed for hot-swappable maintenance without requiring system shutdown or operational interruption.

Embedded management system the server shall include comprehensive embedded management through a dedicated remote access controller with service module integration, direct management ports, and optional wireless management modules. The management system shall provide complete out-of-band management capabilities including remote console access, virtual media support, power control, and comprehensive system health monitoring with detailed logging and alerting mechanisms accessible through dedicated network interfaces and web-based management consoles. Network connectivity the server

shall include embedded network interfaces with dual 1 GbE LAN on Motherboard (LOM) ports providing baseline connectivity. Additional network expansion shall be supported through open compute project compatible slots for flexible network interface card deployment. The system does not support graphics processing unit installations. Front panel connectivity shall include dedicated management ports, USB connectivity for peripheral devices, and legacy video output, while rear panel connectivity shall encompass additional USB ports, optional serial connectivity, network interfaces, and video output, supplemented by internal connectivity options for embedded devices and peripherals.

Expansion capabilities the server shall support multiple PCIe Gen4 expansion slots for additional connectivity, acceleration cards, and specialized hardware adapters. All expansion slots shall support full bandwidth capabilities and hot-plug functionality where compatible with the operating system and specific adapter configurations, enabling flexible system customization for diverse workload requirements.Security features the server shall incorporate comprehensive hardware security features including cryptographically signed firmware validation, secure boot processes, secure data erasure capabilities, silicon-based root of trust implementations, and configurable system lockdown functionality requiring appropriate management license levels. Trusted Platform Module support shall encompass multiple international standards and certifications including Federal Information Processing Standards compliance, Common Criteria certification, and regional cryptographic standards for global deployment compatibility.

Operating Systems and Hypervisors The server shall support multiple enterprise operating systems and virtualization hypervisors including various Linux distributions with long-term support commitments, commercial hypervisor platforms, Microsoft Windows Server with native virtualization capabilities, and industry-standard enterprise Linux implementations, with all operating system installations supported through manufacturer-provided drivers, firmware updates, and management agent integrations.

Management Software The server shall be manageable through comprehensive management software suites including enterprise-grade management consoles with integrated power management, proactive support automation, and centralized update management capabilities. Mobile device management shall be supported through dedicated applications enabling remote monitoring and administration from handheld devices, while third-party integration shall encompass compatibility with major enterprise management platforms from leading technology providers including system centre solutions, virtualization management tools, network operations systems, and open-source monitoring frameworks through dedicated connection utilities and programmable interfaces. Reliability and serviceability All critical server components including power supply units, cooling system elements, and storage devices shall be designed for hot-swappable replacement to enable maintenance and upgrades without system downtime. The server architecture shall incorporate comprehensive diagnostic capabilities with detailed system logging, environmental monitoring, and predictive failure analysis through embedded management controllers, while supporting automated health monitoring and

proactive maintenance scheduling for optimal system availability and performance continuity.

Enterprise Workstation

Processor specifications the workstation shall be equipped with an 11th Generation Intel Core i7-11700 processor featuring 8 cores, 16 threads, and a base clock speed of 2.5 GHz with maximum turbo frequency up to 4.9 GHz. The processor shall include 16 MB smart cache and maintain a 65W thermal design power rating. The system shall be pre-installed with Windows 10 Professional 64-bit operating system with appropriate licensing and activation. Chipset and motherboard architecture the system motherboard shall utilize the Intel W580 chipset providing comprehensive platform features including enhanced connectivity, memory support, and peripheral interface capabilities. The chipset shall support all processor features and provide adequate bandwidth for connected device s and expansion components. Memory configuration The workstation shall feature four DIMM slots supporting dual-channel memory architecture with capacity for up to 128GB total system memory. Memory support shall encompass both non-ECC and ECC DDR4 modules with speeds up to 3200 MHz. All memory modules shall be easily accessible and replaceable through tool-less design where applicable.

Graphics and display capabilities the system shall include one PCI Express x16 Generation 4 expansion slot capable of supporting dedicated graphics cards with power requirements up to 350W. As a recommended configuration, the system may support NVIDIA P1000 professional graphics cards with 4GB GDDR5 memory. The system shall provide comprehensive display output options to support multiple monitor configurations. Storage subsystem the workstation shall support flexible storage configurations including capacity for up to three 3.5-inch SATA drives or four 2.5-inch SATA drives. Additionally, the system shall include M.2 2280 slot supporting NVMe Generation 4 solid state drives with capacities up to 512GB or higher. The integrated storage controller shall utilize Intel Rapid Storage Technology version 12.0 supporting SATA 6Gb/s interfaces and host-based RAID configurations including RAID 0, 1, 5, and 10 for data protection and performance optimization.

Audio system the audio subsystem shall include an integrated Realtek ALC3246 high-definition audio codec providing two-channel audio output. Audio output options shall include an optional internal speaker system, optional dedicated stereo speaker systems compatible with the workstation, optional sound bar solutions for select flat-panel displays, and optional professional stereo headset systems available in both wired and wireless configurations for communication and multimedia applications.

Network communications the +++workstation shall feature an integrated Intel Ethernet Connection I219-LM controller supporting 10/100/1000 Mbps network speeds. Optional network enhancements shall include a second Ethernet connection supporting speeds up to 2.5 Gbps, dedicated PCIe gigabit networking cards, or specialized network interface cards such as the Aquantia AQtion AQN-108 supporting 5/2.5 GbE connectivity. Wireless

capabilities may be added through optional PCIe add-in cards supporting Wi-Fi 6 (802.11ax) standards with Bluetooth 5.2 integration.

Input/output ports Front Panel Connectivity The chassis front panel shall offer two possible I/O configurations: Standard and Advanced. The Standard configuration shall include two USB 2.0 Type-A ports, one USB 3.2 Type-A Generation 1 port (5 Gbps) with Power Share functionality, one USB 3.2 Type-C Generation 2 port (10 Gbps) with Power Share, one 3.5mm headphone jack with microphone support, and shall exclude an SD card reader. The Advanced configuration shall include one USB 3.2 Type-A Generation 1 port (5 Gbps), one USB 3.2 Type-A Generation 2 port (10 Gbps), one USB 3.2 Type-A Generation 2 port (10 Gbps) with Power Share, one USB 3.2 Type-C Generation 2x2 port (20 Gbps) with Power Share, one 3.5mm headphone jack with microphone support, and shall include an integrated SD card reader.

Rear Panel Connectivity The rear panel connectivity shall include two DisplayPort 1.4 outputs, two legacy PS/2 ports for keyboard and mouse connectivity, two USB 2.0 Type-A ports with Smart Power technology, one RJ45 network connector, one USB 3.2 Type-A Generation 2 port (10 Gbps), two USB 3.2 Type-A Generation 1 ports (5 Gbps), one audio line-out port, one optional port configurable as VGA, HDMI 2.0, DisplayPort 1.4 with 5K display support, or Type-C with DisplayPort Alternate Mode functionality, and one optional second RJ45 network connector supporting 2.5 Gbps speeds. Power supply unit The workstation shall be equipped with a 460W power supply unit providing stable and efficient power delivery to all system components. The power supply shall incorporate appropriate power conditioning, surge protection, and efficiency ratings suitable for continuous professional workstation operation. Physical and environmental The workstation chassis shall be designed for professional office environments with adequate ventilation, tool-less access to major components where applicable, and appropriate acoustic management for quiet operation. The system shall comply with relevant safety and emissions standards for commercial deployment.

Three Phase 20 KVA Online UPS System

general requirements the bidder shall supply, install, and commission a complete three-phase uninterruptible power supply system designed to provide continuous, clean, and stable power to critical loads in enterprise environments. The system shall protect connected equipment from power disturbances including blackouts, brownouts, surges, spikes, and electrical noise while ensuring seamless power continuity during utility power failures. electrical performance specifications The UPS system shall provide output capacity of 20 KVA (18 KW) with three-phase power delivery at 400 volts nominal voltage. The output power factor shall be optimized for modern computing loads with high efficiency operation. The system shall maintain output voltage accuracy within specified tolerances under all load conditions from no-load to full load, with comprehensive protection against voltage variations and frequency deviations.

output characteristics The output voltage shall be precisely regulated at 400 volts three-phase with neutral and ground connections, maintaining voltage stability within ±1% of nominal voltage under all operating conditions. Output voltage distortion shall be limited to less than 3% for linear loads and less than 5% for non-linear loads, ensuring clean power delivery to sensitive electronic equipment. The output waveform shall be pure sine wave with harmonic distortion meeting international standards for computer-grade power. Output frequency shall synchronize to mains frequency within 50/60Hz ±3Hz range when operating in line-interactive mode or maintain ±0.1% frequency stability when operating in standalone mode.

input specifications The system shall accept three-phase input voltage of 400 volts nominal, with compatibility for 380 volt and 415-volt configurations as required by local electrical standards. The input voltage operating range shall span from 304 volts to 477 volts, providing wide input tolerance for unstable utility power conditions. Input power factor correction shall achieve minimum 0.99 power factor, reducing harmonic distortion and improving energy efficiency. Input connections shall utilize hard-wired five-wire configuration (three phases, neutral, and ground) with appropriate terminal blocks for secure electrical connections. efficiency and performance The UPS system shall demonstrate greater than 89% efficiency at full load conditions, with optimized efficiency curves maintaining high performance across the complete load range. The system shall support load crest factor of 3:1, accommodating modern switching power supplies and nonlinear loads typical in information technology environments. Transfer time between operating modes shall be less than 0 milliseconds, ensuring no interruption to connected equipment during power transitions. All performance parameters shall be maintained throughout the specified operating temperature and humidity ranges.

battery system specifications The UPS shall operate with a 240-volt DC battery bus compatible with sealed maintenance-free (SMF) battery technology. The system shall support external battery cabinets with battery capacity ranging from 26 to 100 ampere-hours per string, providing flexible runtime options based on application requirements. Battery circuit protection shall include optional circuit breakers for safety and maintenance purposes. The battery management system shall include temperature-compensated charging, automatic battery testing, and state-of-charge monitoring with predictive failure analysis. system configuration requirements the complete UPS installation shall include twenty sealed maintenance-free batteries rated at 12 volts, 26 ampere-hours each, configured to provide the required DC bus voltage and backup runtime. A dedicated battery rack shall be supplied to securely house all twenty batteries with proper ventilation, cable management, and safety clearances. All necessary interlink connectors, cables, and termination kits shall be included to establish the 240-volt DC connection between the UPS unit and battery bank. The battery system shall be designed for easy maintenance and replacement while ensuring electrical safety and reliability.

monitoring and management capabilities The UPS shall feature a multi-function LCD status and control console displaying real-time operational parameters including input/output voltage and frequency, load percentage, battery status, and system alarms. Optional SNMP

management capabilities shall be available for integration into network management systems, enabling remote monitoring, configuration, and alerting. Audible noise emissions shall not exceed 60 decibels measured at one meter from the unit surface, ensuring acceptable acoustic levels for equipment room environments. All monitoring and control interfaces shall be accessible locally and remotely with appropriate security controls. environmental operating conditions The system shall operate reliably within temperature ranges from 0°C to 40°C without derating of performance specifications. Operating relative humidity shall be supported from 0% to 95% non-condensing, accommodating various climatic conditions. The enclosure shall provide IP20 protection class, preventing finger contact with hazardous parts and offering basic protection against solid foreign objects. All components shall be rated for continuous 24/7 operation with adequate thermal management and ventilation requirements.

compliance and certification The complete UPS system shall carry Bureau of Indian Standards (BIS) certification, demonstrating compliance with Indian safety and performance standards. All electrical components and assemblies shall meet relevant international standards for uninterruptible power supply systems. The manufacturer shall provide documentation confirming compliance with electromagnetic compatibility, electrical safety, and environmental regulations applicable to the installation location. Installation shall be performed in accordance with national electrical codes and local regulations.

installation and commissioning the supplier shall provide complete installation services including site preparation, equipment placement, electrical connections, battery installation, and system commissioning. All necessary electrical components including cables, conduits, circuit protection devices, and connection hardware shall be included. Commissioning shall include comprehensive testing of all UPS functions, battery autonomy verification, load testing, and demonstration of all monitoring and management features. Complete documentation including as-built drawings, operation manuals, maintenance procedures, and compliance certificates shall be provided upon project completion. warranty and support The UPS system shall be covered by comprehensive warranty including all electronic components, batteries, and control systems. Battery warranty shall cover defects and premature failure with pro-rata replacement terms based on installation date and usage patterns. Technical support shall include remote monitoring capabilities, preventive maintenance services, and emergency response for critical failures. Training shall be provided for facility personnel covering normal operation, routine maintenance, and basic troubleshooting procedures.

Enterprise Managed Gigabit Ethernet Switch

General requirements the bidder shall supply and install enterprise-grade managed Ethernet switches designed for high-performance networking in data centre, enterprise backbone, and critical infrastructure environments. The switches shall provide comprehensive management capabilities, advanced security features, and high-availability architecture suitable for mission-critical network operations. Port configuration and

connectivity The switch shall provide twenty-four copper Ethernet ports supporting 10Mbps, 100Mbps, and 1Gbps speeds with auto-negotiation capability. Additionally, the switch shall include two copper ports supporting 100Mbps, 1Gbps, and 10Gbps speeds for high-bandwidth uplinks and server connections. Two Small Form-factor Pluggable Plus (SFP+) ports shall be included supporting 1Gbps and 10Gbps fibre optic connections for long-distance or high-speed backbone links. All ports shall support auto-MDI/MDIX functionality and comprehensive link aggregation capabilities.

Performance The switching fabric shall provide 128 Gbps non-blocking throughput capacity with a maximum forwarding rate of 714 million packets per second. Latency shall be less than 0.9 microseconds for 10G SFP+ ports and less than 1.25 microseconds for 10G RJ45 copper ports under full load conditions. The switching architecture shall support jumbo frames up to 9KB for efficient data transmission and reduced CPU overhead for connected devices. Switching capacity and tables The switch shall maintain a MAC address table capacity of 128,000 entries with support for 8,000 ARP/NDP entries simultaneously. IP routing tables shall support 64 IPv4 and 64 IPv6 static routes with dynamic routing protocol support for 512 RIP routes and 512 OSPF routes. IP multicast capabilities shall include support for 1,024 IPv4 multicast groups and 512 IPv6 multicast groups with IGMP membership tables supporting 2,000 entries for both IPv4 and IPv6 protocols.

Power supply and power management the switch shall include one modular power supply bay with a 150W modular power supply unit installed. The power supply shall support hot-swap replacement capability for maintenance without service interruption. Power over Ethernet capability shall provide up to 30 watts per port on designated PoE+ ports for powering connected devices including IP phones, wireless access points, and surveillance cameras. Power management features shall include per-port power budgeting, priority-based power allocation, and remote power cycling capabilities.

Management and administration The switch shall provide multiple management interfaces including one out-of-band 1Gbps Ethernet management port on the front panel, one RJ45 RS232 console port on the rear panel, one mini-USB console port on the front panel, and one USB storage port for configuration backup and firmware updates. Management shall be supported through a single-pane-of-glass network management system platform with mass configuration deployment capabilities. Dual firmware images and configuration files shall be maintained for zero-service-interruption updates and rollback protection. Layer 2 and layer 3 functionality The switch shall provide license-free Layer 2 switching and Layer 3 routing capabilities including Policy Based Routing, RIP, VRRP, OSPF, and Protocol Independent Multicast. VLAN support shall include 4,000 VLANs with 2,000 DHCP server leases supported through 256 IPv4 address pools and 16 IPv6 address pools. Spanning Tree protocols shall include Per VLAN Spanning Tree and Per VLAN Rapid Spanning Tree with interoperability for complex network topologies.

High availability and resiliency The switch architecture shall support non-stop forwarding with hitless failover across stacked configurations. Virtual chassis architectures shall provide stateful synchronization between stack members ensuring continuous operation

during member failures. Stacking capabilities shall allow mix-and-match configurations between different switch models using any 10G/40G port with any media type including RJ45, SFP+, and direct attach copper cables. Distributed link aggregation shall provide zero-downtime failover and load balancing across multiple physical links.

Security features Advanced security capabilities shall include malicious code detection, DHCP snooping, IP source guard protection, and denial-of-service attack mitigation. Access control features shall include port security, MAC address filtering, and 802.1X authentication with multiple supplicant support. Quality of Service implementation shall include Differ policies with eight hardware queues per port and traffic shaping capabilities. Private VLAN functionality shall provide additional security isolation for sensitive network segments. Av-over-ip and multicast capabilities The switch shall be pre-configured for Audio-Video over IP Layer 2 multicast with SDVoE readiness for professional audio-visual deployments. Enhanced IGMP implementation shall prevent network flooding through efficient multicast traffic management. The switch shall support transparent clock implementation for Precision Time Protocol version 2 with one-step clock synchronization for time-sensitive applications.

Physical and environmental The switch shall utilize a fixed fan cooling system with front-to-back airflow and acoustic emissions not exceeding 30.3 decibels at one meter distance. The enclosure shall support standard rack-mount installation with appropriate cable management features. Operating temperature range shall support commercial data centre environments with adequate thermal management for continuous operation. All interfaces and indicators shall be clearly labelled and accessible for installation and maintenance. Software and protocol support the switch shall support comprehensive networking protocols including SNMP, RMON, MIB, LLDP, AAA, sFlow, RSPAN, and PTPv2. Management options shall include command-line interface, web-based graphical user interface, and programmatic APIs for automation. The switch shall support link dependency features enabling or disabling ports based on the link state of different ports for enhanced network control and automation.

Warranty and support the switch shall be covered by a limited lifetime warranty covering hardware defects and premature failures. The manufacturer shall provide firmware updates, security patches, and technical support for the operational lifespan of the equipment. Documentation shall include installation guides, configuration manuals, API references, and troubleshooting guides. Training resources shall be available for network administrators covering configuration, optimization, and advanced feature utilization.

Command Center Video Interface

(Enterprise-Grade Continuous Operation Indoor Visual Platform)

The Contractor shall design, supply, install, integrate, test and commission a professional-grade large-format visual display system engineered for uninterrupted continuous duty cycle operation within an indoor controlled commercial environment. The offered system shall not be a consumer television derivative, residential panel variant, repurposed hospitality display, or semi-commercial monitor. The proposed display platform shall be a purpose-built commercial signage-class visual device rated for continuous twenty-four (24) hours, seven (7) day operational duty without performance degradation, brightness instability, premature backlight failure, image retention anomaly, thermal throttling, or color shift beyond manufacturer-declared tolerances.

The visible display diagonal shall not be less than approximately eight (8) feet, corresponding to a native active image matrix not less than approximately seven (7.0) feet in horizontal dimension and four (4.0) feet in vertical dimension in a fixed 16:9 aspect geometry. Any reduction in active display region, masked borders, pixel cropping, firmware-restricted scaling, or non-native rendering architecture shall be treated as technical non-compliance. The display surface shall employ In-Plane Switching (IPS) or equivalent wide-view commercial panel architecture with direct LED backlight topology engineered for luminance stability and thermal distribution uniformity.

The native pixel matrix shall operate at Ultra High-Definition resolution not less than 3840 × 2160 with a refresh rate not less than 60 Hz, rendered without artificial pixel interpolation to simulate higher resolution content. The brightness capability shall not be less than 500 candela per square meter under typical calibrated condition. The native static contrast ratio shall not be inferior to 1200:1, with dynamic contrast enhancement mechanism achieving not less than 50000:1 under manufacturer declared measurement methodology. Viewing angle performance shall not degrade below 178 degrees horizontal and 178 degrees vertical at a contrast threshold greater than 10:1. Color depth shall support not less than 1.07 billion color gradations utilizing true 8-bit plus Frame Rate Control implementation, and the color gamut shall not be inferior to approximately 72 percent NTSC coverage. Panel haze treatment shall approximate 25 percent anti-glare diffusion to balance reflection control and image clarity.

The display system shall be rated for a minimum operational backlight lifespan of fifty thousand (50,000) hours at rated luminance. Response time shall not exceed eight (8) milliseconds under typical operating condition. The unit shall support both landscape and portrait orientation with firmware-level image rotation without voiding manufacturer warranty. The embedded processing architecture shall be integral to the display and shall not require third-party add-on players for standard CMS execution. The internal computing module shall operate on a commercial Android Open-Source Platform derivative with secured firmware layer, incorporating not less than a quad-core ARM Cortex-A55 class processor or superior architecture, Mali-G31 MP2 class GPU or equivalent, minimum 2GB

DDR4 memory and not less than 16GB embedded eMMC storage. Expandable storage capability via micro-SD shall support capacities up to 1TB. The internal system shall support HTML5 rendering engine, Android-based CMS launcher environment, scheduled playback engine, USB autoplay functionality, automated content launch, HDMI-CEC, HDMI wake function, input failover auto-switching, pixel shift anti-burn-in logic, user interface rotation, video rotation, SNMP support, real-time clock, LAN remote management and multi-display videowall coordination support without mandatory external hardware controller for basic tiled operation.

Network capability shall include 10/100 Ethernet with IEEE 802.1X authentication compliance. Wireless capability shall support Wi-Fi 5 (802.11 a/b/g/n/ac) and Bluetooth 5.1 via OEM-supplied authenticated interface module. The device should support Miracast wireless display technology and incorporate an HTML5 browser engine equivalent to Vewd class rendering capability. Input-Output architecture shall include not less than four HDMI 2.0 ports, one HDMI 2.0 output port, multiple USB ports including at least one USB 3.0, optical digital audio output, headphone output, RS-232 control interface, RJ45 LAN interface, service interface and sensor interface. Omission of any interface category shall be deemed deviation. Integrated stereo audio output shall not be less than dual 12 Watt rated amplification.

Mechanical construction shall be industrial grade with VESA mounting configuration 800 mm × 400 mm (M8). The overall enclosure shall approximate a width of 7.27 feet, height of 4.24 feet and depth approximately 0.32 feet. The structural housing shall be rigid metal-reinforced chassis designed for fixed commercial installation. Bezel width shall be approximately 21 mm per edge. Total equipment mass shall approximate 100 kilograms or greater, reflecting structural commercial build integrity. Lightweight consumer-class substitutions shall not be accepted. Environmental tolerance shall permit operation within temperature band 0°C to 40°C and humidity 10% to 90% non-condensing. Power supply shall operate within 110–240 VAC at 50/60 Hz. Typical power drawing shall not exceed approximately 550 Watts and maximum power drawing shall not exceed approximately 600 Watts. Deep standby power consumption shall not exceed 0.5 Watts.

The OEM shall provide Safety, EMC and CE certification documentation valid at time of bid submission. Certificates shall be issued in the name of the OEM or its Indian subsidiary. Generic downloadable declarations without traceable serial verification shall not be accepted. All technical performance values quoted shall be substantiated by official OEM technical data sheet, and the bidder shall submit certified OEM product datasheet along with the technical proposal. Any discrepancy between declared values and official datasheet shall result in rejection without further clarification. The proposed display, embedded controller platform and CMS compatibility layer shall originate from the same OEM ecosystem to ensure firmware consistency, lifecycle compatibility and warranty alignment. The bidder shall confirm long-term firmware availability and spare support. Bidder shall submitted OEM Authorization and Technical compliance along with technical bid

The offered system shall be subject to dimensional verification, brightness verification using calibrated luminance meter, and functionality validation during pre-dispatch inspection if required by the Consultant. Failure to meet any declared parameter shall be treated as material non-compliance.

SIP SERVER

System overview and general requirements the bidder shall supply, install, configure, and commission enterprise-grade SIP communications servers designed as complete unified communications platforms integrating voice, video, messaging, and collaboration services. The system shall serve scalable deployments from small business to medium enterprise environments requiring robust performance, high availability, and comprehensive communication features for business-critical operations. All components must be designed for continuous 24/7 operation with failover capabilities and comprehensive security features compliant with industry standards.

Processing Platform and Computational Architecture The server shall be equipped with a multi-core ARM Cortex-A53 processor architecture operating at minimum 1.5GHz clock speed with integrated hardware acceleration for cryptographic operations and media processing. The system must include a minimum of 2GB DDR4 system memory with error-correction capabilities, expandable to support maximum user capacity. Storage shall be provided through eMMC flash memory with minimum 16GB capacity, supporting operating system, configuration data, and voice recording storage requirements, with additional microSD card slot supporting up to 256GB external storage for expanded recording capacity and system backups.

Physical Dimensions and Construction The server enclosure shall conform to standard 1U rack-mountable dimensions with height not exceeding 44mm, width of 482mm, and depth not exceeding 280mm. The chassis construction must utilize heavy-gauge steel with proper ventilation openings, fanless passive cooling design, and mounting provisions for standard 19-inch equipment racks. The total weight of the unit shall not exceed 4kg to facilitate installation and maintenance procedures. The physical design must include adequate ventilation and thermal management for continuous 24/7 operation within temperature ranges from 0°C to 40°C with relative humidity from 10% to 90% non-condensing.

Network Interface Configuration and Performance The system shall include six Gigabit Ethernet ports (10/100/1000 Mbps) with auto-negotiation and auto-MDI/MDIX capabilities, configured as: two WAN ports with failover and load balancing support, four LAN ports with VLAN tagging support, and dedicated management functionality. All network interfaces shall support jumbo frames up to 9KB and include hardware-based Quality of Service (QoS) prioritization with 8 priority queues per port utilizing strict priority and weighted round-robin scheduling algorithms. Packet processing latency shall not exceed 0.5 milliseconds for local traffic and 2 milliseconds for routed traffic under normal load conditions, with non-blocking throughput of 2Gbps and packet forwarding rate of 1.48 million packets per second.

Power Supply and Electrical Specifications The server shall operate on universal AC power input from 100V to 240V at 50/60Hz with automatic voltage detection and power factor correction of minimum 0.9. Power consumption shall not exceed 15 watts under normal operating conditions and 25 watts under maximum load. The system must include integrated power surge protection with 6KV line-to-line and 6KV line-to-ground protection levels, brownout protection for operation during voltage sags down to 85V, and power failure detection triggering automatic graceful shutdown when operating on backup power systems.

Audio and Telephony Interfaces The server shall provide two FXS ports for analog telephone connectivity with support for standard loop-start and ground-start signalling, and one FXO port for PSTN line integration with caller ID detection capabilities. All analog interfaces shall include built-in surge protection compliant with ITU-T K.20/K.21 standards for lightning and surge immunity. Internal storage shall support a minimum of 1,000 hours of compressed voice recordings at 8Kbps bitrate with simultaneous recording of multiple calls and configurable retention policies. User and Session Capacity The communications server shall support scalable user capacity configurations with maximum of 500 registered SIP endpoints and concurrent handling of 150 simultaneous voice calls. Video conferencing capacity must support up to 9 participants in a single conference room with 720p resolution. The system must maintain call setup times under 500 milliseconds for local calls and under 2 seconds for external calls under maximum capacity conditions. The architecture shall support linear expansion through additional licensing without requiring hardware modification, maintaining consistent performance and quality of service at maximum specified capacities.

Voice Processing and Codec Support The server shall incorporate dedicated digital signal processors or software-based voice processing engines for high-quality voice handling with advanced echo cancellation (minimum 60dB attenuation), noise reduction, and automatic gain control. Supported codecs must include comprehensive voice compression standards (G.711, G.722, G.729, Opus) with automatic transcoding between different codecs as required by endpoints and service providers. Voice quality enhancement features shall include dynamic jitter buffering, packet loss concealment, and adaptive voice activity detection for optimal performance under varying network conditions. Core Communication Features The system shall provide integrated instant messaging and presence management with real-time status updates across all connected devices. Video conferencing capabilities must support multi-party high-definition video sessions with screen sharing and collaboration tools. Mobile integration shall include native iOS and Android applications with feature parity to desktop clients, including call handling, presence management, simultaneous ringing, call transfer, and visual voicemail.

Contact Center and Advanced Features The system must include comprehensive contact centre features including automatic call distribution with skill-based routing, interactive voice response with multi-level menus, call queuing with position announcements, and real-time supervisor monitoring dashboards with wallboard display capabilities. Additional features shall include find-me/follow-me routing, call parking, call pickup groups, and

music-on-hold with multiple audio source support. Communication Security All communications shall be protected with industry-standard encryption for both signalling and media streams with support for TLS and SRTP protocols using AES-256 encryption standards. The system must include built-in firewall capabilities with stateful packet inspection, denial of service protection, and automatic intrusion detection with real-time alerting. Access control shall be enforced through role-based administration with comprehensive audit logging of all configuration changes, system access, and communication activities. Network Security Implementation The system shall implement comprehensive security measures including encrypted communications between all system components, secure authentication for administrative access using multi-factor authentication options, and protection against common network attacks including SIP flooding, registration attacks, and toll fraud attempts. Regular security updates must be provided by the manufacturer to address emerging vulnerabilities and maintain system integrity.

System Redundancy The server architecture shall support high-availability configurations with automatic failover mechanisms ensuring continuous service availability with sub-second failover times. The system must support redundant power configurations and optional geographic redundancy setups for disaster recovery scenarios with automatic synchronization between primary and backup systems. Storage system must support RAID configurations with automatic rebuild capabilities in case of drive failure. Hardware Reliability The server design shall include built-in hardware monitoring with temperature sensors generating automatic alerts when thresholds are exceeded. System health monitoring must track component status including storage wear level, memory error rates, and network interface error counts with predictive failure analysis. Mean time between failures (MTBF) shall exceed 50,000 hours under normal operating conditions with fanless passive cooling design ensuring maximum surface temperature not exceeding 50°C during continuous operation.

Administration Interfaces The system shall provide web-based administration interfaces with intuitive configuration tools for system setup, user management, and ongoing maintenance, accessible through standard web browsers with role-based access control for different administrative functions. Real-time monitoring dashboards must display system health, communication statistics, resource utilization, and performance metrics with customizable views and alert configurations. Provisioning and Configuration Bulk provisioning capabilities shall be available for mass deployment of endpoints and user configurations using template-based setups and automated discovery of supported endpoints. The system must support automatic provisioning through standard protocols including HTTP/HTTPS, TFTP, and TR-069 with centralized management of distributed deployments. Configuration management shall include version control, backup/restore functionality, and audit trail of all configuration changes.

Reporting and Analytics Comprehensive reporting tools must generate detailed call detail records with searchable archives, traffic analysis reports, system utilization statistics, and compliance documentation in multiple export formats (CSV, PDF, HTML). Real-time

reporting shall include active call monitoring, queue statistics, and agent performance metrics with historical trend analysis for capacity planning and performance optimization. Third-Party Integration The communications server shall provide native integration with popular customer relationship management systems including Salesforce, Microsoft Dynamics, and Zoho CRM with click-to-call and screen pop functionality. Integration with enterprise directory services including Microsoft Active Directory and LDAP shall support automated user provisioning, authentication, and synchronization of contact information. API and Development Interfaces RESTful APIs must be available for custom integration with business applications and workflow systems with comprehensive documentation including API references, code samples, and integration guides. The system shall support standard integration protocols including SIP, HTTP/HTTPS, XML, and JSON with webhook support for event-driven notifications and automated workflow triggers.

Interoperability and Standards Compliance The system shall maintain compatibility with industry-standard SIP endpoints from multiple manufacturers with certified interoperability for major brands. Compliance with relevant telecommunications regulations and data protection standards must be documented, including support for lawful interception where required by local regulations. All hardware components shall carry CE, FCC, RoHS, and UL/EN/IEC 60950-1 certifications with appropriate regulatory markings. Physical Installation The server shall support multiple mounting configurations including standard 19-inch rack mounting using included brackets, wall mounting using optional accessories, and desktop placement with anti-slip feet. All necessary mounting hardware including rack ears, screws, cable management accessories, and wall mounting templates shall be provided. Installation shall include proper grounding, power conditioning, and environmental considerations for reliable operation.

ENTERPRISE GRADE AUDIO ADVISORY INTERFACE

The bidder shall supply and implement enterprise-grade public address system management software designed for centralized control and management of distributed audio systems. The software shall utilize client-server architecture with multi-user access capabilities supporting simultaneous administration from multiple workstations. The platform must provide comprehensive audio management, zone control, scheduling automation, and emergency notification functionality through an intuitive graphical user interface accessible via standard web browsers and dedicated desktop applications. Device Management and Discovery The software shall support automatic discovery and registration of compatible audio endpoints and network audio devices across the local network with manual addition capability for devices on separate network segments. Device management must include bulk configuration capabilities, firmware update management, and centralized status monitoring with real-time health indicators for each connected device. The system shall maintain a comprehensive device inventory with detailed information including IP address, MAC address, firmware version, and operational status.

Zone Configuration and Management The software shall provide flexible zone management capabilities supporting hierarchical zone structures with parent-child relationships for

logical grouping of audio devices. Zone configuration must include individual volume control, equalization settings, and source assignment with inheritance options for child zones. The system shall support dynamic zone creation and modification without requiring physical reconfiguration of audio endpoints. Multiple Audio Source Support The system shall support concurrent management of multiple audio sources including local media files (MP3, WAV, AAC), internet radio streams, line-in inputs, text-to-speech synthesis, and live microphone inputs. Audio source management must include priority-based source selection with configurable override rules for emergency announcements and critical notifications. The software shall provide audio source scheduling with calendar-based programming and exception handling for holidays and special events.

Background Music Management The software shall include comprehensive background music management capabilities with playlist creation, shuffle/repeat modes, and volume normalization across different audio sources. Music scheduling must support time-based automation with fade-in/fade-out transitions and seamless switching between different audio sources. The system shall include audio library management with categorization, search functionality, and metadata support for organized content management. Live Announcement Capabilities The software shall provide immediate live announcement functionality with zone selection, microphone source selection, and monitoring capabilities. Live announcements must support priority levels with configurable pre-emptive behavior overriding lower-priority audio sources. The system shall include announcement recording capabilities with storage for later playback and scheduling.

Scheduled Announcements The software shall support creation and management of scheduled announcements with precise timing control, recurrence patterns, and conditional execution based on system events or external triggers. Announcement scheduling must include preview functionality, conflict detection, and automated execution with confirmation notifications. The system shall maintain announcement history with detailed logs including execution status and any errors encountered. Emergency Broadcast System The software shall include dedicated emergency notification functionality with pre-configured emergency messages, tone generation, and automated activation procedures. Emergency broadcasts must provide highest priority override capability with configurable pre-alert tones and post-message instructions. The system shall support emergency scenario management with different message sets for various emergency types (fire, security, weather, etc.).

Integration with External Systems The software shall provide integration capabilities with external emergency systems including fire alarm panels, security systems, and building management systems through digital inputs, network protocols, or API interfaces. Integration must support automatic activation of predefined emergency broadcasts based on external triggers with configurable delay and confirmation options. The system shall include test mode functionality for emergency procedures without activating actual broadcasts. Calendar-Based Scheduling The software shall provide comprehensive calendar-based scheduling with daily, weekly, monthly, and yearly schedule support. Scheduling must include exception handling for holidays, special events, and maintenance

periods with configurable override rules. The system shall support schedule import/export functionality for bulk schedule management and synchronization with external calendar systems.

Event-Based Automation The software shall support event-driven automation with conditional logic based on time, date, system events, or external triggers. Automation rules must include if-then-else logic with multiple conditions and actions supporting complex automation scenarios. The system shall include visual workflow designer for creating and managing automation rules without requiring programming expertise. Real-Time Monitoring The software shall provide real-time monitoring dashboard displaying system status, active broadcasts, device health, and current audio sources across all zones. Monitoring must include visual indicators for system status, audio levels, and error conditions with drill-down capability for detailed information. The system shall support remote monitoring from multiple locations with appropriate access controls.

Historical Reporting The software shall maintain comprehensive historical logs of all system activities including broadcasts, announcements, system events, and user actions. Reporting capabilities must include customizable report generation with filtering options, export to multiple formats (PDF, CSV, Excel), and scheduled report distribution. The system shall include analytics features for usage patterns, peak load analysis, and system performance trends. Multi-User Access Control The software shall support multi-user access with role-based permissions defining access levels for different system functions. User management must include individual user accounts with password policies, session management, and activity logging. The system shall support integration with external authentication systems including Active Directory, LDAP, and RADIUS for centralized user management.

Security Features The software shall implement comprehensive security measures including encrypted communications (HTTPS/TLS), secure authentication, and protection against common web application vulnerabilities. Access control must include granular permissions for different system functions with audit logging of all security-related events. The software shall receive regular security updates and patches from the manufacturer. Hardware Compatibility The software shall maintain compatibility with industry-standard network audio devices and protocols including SIP, RTSP, and proprietary protocols of major audio equipment manufacturers. Compatibility must be certified and documented with specific device models and firmware versions. The system shall support automatic driver updates and compatibility patches as new devices are added to the ecosystem.

API and Third-Party Integration The software shall provide comprehensive API interfaces (RESTful and/or SOAP) for integration with third-party systems including building management systems, digital signage, access control systems, and emergency notification platforms. API documentation must include code samples, integration guides, and testing tools. The system shall support webhook notifications for event-driven integration with external applications. Server Requirements The software shall support installation on standard Windows Server operating systems (Windows Server 2016 or later) with minimum

hardware requirements of 4-core processor, 8GB RAM, and 100GB available storage. The system must support virtualized deployment on VMware, Hyper-V, or equivalent virtualization platforms with appropriate performance considerations. Database requirements shall include support for Microsoft SQL Server or equivalent database systems.

Client Requirements The software shall provide web-based client access compatible with modern web browsers (Chrome, Firefox, Edge, Safari) without requiring browser plugins. Optional desktop applications shall be available for enhanced functionality with support for Windows 10/11 operating systems. Mobile access shall be provided through responsive web design or dedicated mobile applications for iOS and Android devices. Configuration Backup The software shall include automated configuration backup capabilities with scheduled backups to local or network storage locations. Backup management must include versioning, retention policies, and automated restoration procedures. The system shall support export/import functionality for configuration migration and disaster recovery scenarios.

High Availability Support The software architecture shall support high availability deployments with failover clustering, load balancing, and geographic redundancy options. The system must include database replication capabilities and synchronization mechanisms for distributed deployments. Disaster recovery procedures must be documented and tested as part of the implementation process. Software Maintenance The software shall be supplied with annual maintenance agreement including software updates, security patches, and compatibility updates. Maintenance must include access to new features and enhancements released during the maintenance period. The manufacturer shall provide a product roadmap and commitment to backward compatibility for major version upgrades. Technical Support The supplier shall provide technical support services including installation assistance, configuration guidance, troubleshooting, and performance optimization. Support channels must include email, telephone, and online ticketing system with defined response times based on issue severity. The manufacturer shall provide online knowledge base, user forums, and training resources for self-service support.

Training and Documentation Comprehensive documentation shall be provided including installation guides, administrator manuals, user guides, API documentation, and integration guides. Training services must be available for system administrators and end-users including onsite training, web-based training, and train-the-trainer programs. The supplier shall provide regular webinars and user group meetings for knowledge sharing and best practice dissemination.

CCC INFRA WORK

The Contractor shall provide complete Control Room infrastructure required to make the facility fully functional and operational at site. The scope shall include supply, installation and arrangement of necessary furniture such as operator workstations, control consoles,

operator tables, equipment tables, and seating suitable for continuous monitoring operations. Furniture layout shall be coordinated with approved room drawings and equipment placement to ensure ergonomic access and cable routing convenience. The Contractor shall execute all required passive networking works including installation of data cables, patch panels, I/O outlets, cable trays, conduits, patch cords, labeling and termination required for interconnection of control systems, display equipment, network switches and operator terminals. Suitable racks (floor standing or wall mounted as required) shall be provided for mounting of active and passive equipment along with proper cable management accessories. All necessary electrical work required for making the control room operational shall be included. This shall cover provision of power points, UPS power outlets, lighting points, earthing connections, distribution boards (if required), and concealed wiring through conduits or trays. All mounting hardware, brackets, supports and fixing accessories required for installation of equipment shall be included. The control room shall be handed over in ready-to-use functional condition.

CMS PLATFORM

The proposed digital signage solution is built on a robust cloud-based Software-as-a-Service (SaaS) architecture that enables centralized management of distributed display networks. The platform features a web-based content management system accessible through standard web browsers, complemented by a mobile application for on-the-go management. The system supports enterprise-scale deployments capable of managing hundreds of thousands of displays simultaneously across multiple locations. The architecture employs a multi-tenant design ensuring data isolation and security while maintaining high availability with 99.9% uptime commitment. The solution supports various display technologies including commercial-grade LCD/LED displays, video walls, and interactive kiosks, with compatibility for both dedicated media players and all-in-one smart displays.

The remote device management system will provide comprehensive capabilities for monitoring, controlling, and maintaining all Data Visualization Interfaces and associated hardware deployed across APMC locations. This subsystem will enable centralized administrators to perform real-time monitoring of device status, including connectivity, storage utilization, software versions, and hardware health parameters. Advanced device grouping capabilities will allow logical organization of displays by location, type, or functional requirements, enabling efficient bulk operations and targeted content distribution. The system will implement sophisticated synchronization mechanisms to ensure consistent content playback and timing across device groups, maintaining uniform information dissemination across multiple locations.

Proactive monitoring features will include automated health checks, performance benchmarking, and predictive maintenance alerts based on device behavior patterns. Remote troubleshooting capabilities will enable support staff to diagnose issues, perform configuration changes, and implement corrective actions without physical site visits. The system will maintain comprehensive device inventories with detailed specifications, warranty information, and service history to support maintenance planning and resource

allocation. Automated reporting functions will generate regular summaries of device status, utilization metrics, and maintenance requirements for management review and compliance reporting.

The content management subsystem will provide robust tools for creating, organizing, scheduling, and publishing diverse content types across the information broadcasting network. The system will support a comprehensive range of content formats including text, images, videos, audio files, PDF documents, live streaming feeds, and RSS data streams, ensuring flexibility in information presentation. An intuitive drag-and-drop content editor will enable users with varying technical skills to create engaging visual layouts without specialized design expertise. Advanced template libraries will provide pre-designed layouts tailored for agricultural information types, including market price displays, weather forecasts, government scheme announcements, and emergency alerts.

Content scheduling capabilities will support complex programming requirements with daily, weekly, and monthly scheduling patterns, special date handling for holidays and market days, and priority-based content override mechanisms. Version control systems will maintain complete histories of content changes, enabling rollback to previous versions and tracking of content lifecycle. Multi-language support will facilitate content creation in Hindi, English, and other Indian languages, with tools for managing translations and ensuring consistency across language versions. Content approval workflows will enforce organizational review processes, while digital rights management features will protect proprietary content and ensure compliance with usage terms.

The digital signage capabilities will encompass advanced features for dynamic content presentation, layout management, and interactive information display. The system will support sophisticated layout designs including single-screen full-screen content, split-screen configurations with multiple content zones, and independently controlled frames for simultaneous display of different information types. Scrolling ticker functionality will enable display of real-time updates, news feeds, and emergency alerts without disrupting main content presentation. The platform will include programmable content logic that ensures continuous operation even during network connectivity loss, with intelligent caching and fallback content mechanisms.

Live data integration capabilities will enable real-time display of market prices, weather information, and other dynamic data sources through widget-based components. Social media integration will support display of relevant feeds from authorized accounts, while emergency alert systems will provide immediate broadcast capabilities for critical information. The system will support multiple screen orientations and aspect ratios, automatically optimizing content layout for portrait or landscape displays. Advanced transition effects and animation capabilities will enhance visual appeal, while compliance with digital accessibility standards will ensure information accessibility for users with disabilities.

The API integration framework will establish secure, scalable, and standardized interfaces for connecting with external data sources and systems. RESTful API architecture will form the foundation for all integrations, providing predictable, resource-oriented endpoints with consistent response formats. The system will implement comprehensive API security measures including OAuth 2.0 authentication, API key management, rate limiting, and request signing to prevent unauthorized access and ensure data protection. Version-controlled API endpoints will maintain backward compatibility while enabling system evolution, with detailed documentation and testing tools provided for integration partners.

Primary integration points will include real-time connections to mandi price databases for current commodity pricing, government agriculture portals for scheme information and advisory content, weather information services for forecasts and alerts, and departmental analytics dashboards for performance reporting. The API framework will support both push and pull data exchange models, with webhook capabilities for real-time notifications and batch processing for large data volumes. Comprehensive logging and monitoring will track API usage, performance metrics, and error rates, while automated alerting will notify administrators of integration failures or performance degradation.

The security framework will implement comprehensive measures to protect system integrity, data confidentiality, and operational continuity across all components of the information broadcasting ecosystem. Multi-factor authentication (MFA) will be enforced for all administrative users, combining password authentication with secondary verification methods to prevent unauthorized access. Data encryption will employ TLS 1.3 or higher protocols for all data in transit, while AES-256 encryption will protect data at rest in both cloud storage and edge device caches. Role-based access control (RBAC) will implement granular permission sets tailored to different user roles, ensuring principle of least privilege access across all system functions.

The system will maintain comprehensive audit trails capturing all user activities, content changes, configuration modifications, and system events with tamper-evident logging. Compliance with Government of India IT Security Guidelines will be maintained through regular security assessments, vulnerability scanning, and adherence to established security frameworks. Automated security monitoring will detect and alert on suspicious activities, while incident response procedures will provide structured approaches to security event management. Regular security patching and updates will address emerging vulnerabilities, with change management processes ensuring stable operation throughout the system lifecycle.

VIDEO SWITCHER

5-Channel All-in-one Switcher must be a robust, multi-channel unit capable of acquiring, decoding, encoding, and managing audiovisual feeds from a variety of broadcast and IP-based input sources. It shall provide input compatibility with standard protocols, including but not limited to: Real-Time Streaming Protocol transmitted over both User Datagram Protocol (either direct or multicast), Transmission Control Protocol, and via Hypertext

Transfer Protocol. Additionally, it must be capable of operating as a Secure Reliable Transport caller. Support for Moving Picture Experts Group – Transport Stream via UDP is required, along with both push and pull mechanisms of Real-Time Messaging Protocol, as well as raw UDP streams (unicast and multicast), HTTP Live Streaming, and MPEG-TS over TCP Pull. The unit shall further provide compatibility with mainstream video content sharing platforms. On the audio interface side, it must have a dual analog output interface consisting of two RCA connectors (for left and right channels), in addition to support for embedded audio through the HDMI digital interface. The visual signal output must be provided through both digital and analog forms—specifically one HDMI output using version 2.0 and one composite output for analog video. For networking, the hardware must incorporate a standard RJ-45 female port compatible with both 10- and 100-megabit Ethernet connectivity. Configuration via Dynamic Host Configuration Protocol or static IP settings must be supported to allow for diverse networking topologies. The video format compatibility must be comprehensive. On the resolution front, the system is required to accept Full High-Definition progressive scan video at frame intervals including 60, 59.94, 30, 29.97, 25, and 24 frames per second. It must also accept interlaced video in FHD at 60, 59.94, and 50 frames, as well as HD at 720p60, 59.94, and 50. Legacy standards such as 576i (used in PAL systems) and 480i (used in NTSC systems) are also to be supported. For decoding, the device must manage resolutions of up to Full HD progressive at 60 or 50 frames per second. Control of the device shall be handled via a modern user interface accessible through standard web browsers.

Additionally, it must support command-line interaction over TCP/IP through socket commands. Configuration and real-time operation should be accessible over the network, with no requirement for additional proprietary software installations. Firmware updates must occur automatically through the device's native interface, allowing for maintenance with minimal user intervention. Power input must accept alternating current in the range of one hundred to two hundred and forty volts through a switching adaptor. Output from the adaptor must deliver a direct current supply rated at twelve volts with a maximum current draw of 0.5 amperes. The video standards handled by the system must include both high-definition and standard-definition modes. Accepted formats on the input side shall include: 1080 progressive scan at 60, 59.94, and 50; also at 30, 29.97, 25, 24, and 23.98; interlaced 1080 at 60, 59.94, and 50; 720 progressives at 60, 59.94, and 50; and interlaced SD at 480i59.94 and 576i50. Output signals must mirror or convert these inputs accordingly: 1080p inputs must output as 1080p at the same rates, while interlaced signals must be deinterlaced and delivered as 1080p30, 1080p29.97, or 1080p25. The system must downscale standard definition interlaced inputs to 480p at 29.97 or 576p at 25, without preserving interlacing. Video input types are to include one SDI-compatible BNC connector (supporting 3G/HD/SD), four HDMI 1.4 connectors with the first channel offering SDI/HDMI dual-mode, and a USB 3.0 port. Additionally, it must support at least three IP-based stream inputs using formats such as SRT, RTSP, or NDI|HX. Mixing between HD and SD sources must be seamless. Computer graphics should be supported through four HDMI interfaces. Output must consist of one SDI pass-through port, one HDMI for program output, and one HDMI for multi-view monitoring. Networking must be handled through two Ethernet ports:

one for local control (LAN) and another for WAN or streaming purposes. Audio input compatibility shall include XLR (balanced), RCA (unbalanced), embedded HDMI and SDI, as well as IP audio in either AAC-ADTS or PCM formats.

the system must allow for audio mixdown between external and embedded sources and must feature an onboard audio mixer. It shall also provide a headphone output through a 3.5 mm jack for monitoring and offer audio delay per channel adjustable up to 3000 milliseconds. Basic transition effects such as direct cuts, picture-in-picture overlays, and logo insertion must be available. A built-in title editor accessible from the web interface is required. Advanced keying (DSK/USK) or reference input/output is not necessary. Device control must include RS-232 over RJ-45 for integration with automation systems. Recording must be handled internally via a SATA interface, storing files in .MP4 format with FAT or exFAT support. The video compression standard must be H.264, with audio encoded in AAC-LC at 48 kHz and 16-bit resolution. Bitrate settings must allow for 128, 256, and 384 kbps options. For streaming, it must support various protocols including TS over UDP (unicast and multicast), RTSP via HTTP, TCP, or UDP, RTMP/RTMPS, HLS, and both calling and listening modes for SRT. WebRTC and NDI|HX functionality must be available for real-time and IP production workflows. Bidder Should submitted OEM Authorization along with Technical Bid

SURGE PROTECTION AND POWER CONDITIONING

Surge Protection and Power Conditioning Device shall have minimum capability to provide guaranteed surge suppression and mains power conditioning for audio, video and mission critical equipment at service panels, sub-panels and associated distribution points, and shall be installed at the designated electrical location strictly in coordination with the Electrical contractor, forming part of the overall branch circuit protection strategy. The unit shall be housed in a minimum professional-grade NEMA magnetic shielding steel enclosure or better, suitable for installation at service entrance locations, sub-panels and in-ceiling plenums, and shall comply with applicable electrical safety codes and installation practices.

The device shall be engineered with minimum Advanced Series Mode surge protection and mains power conditioning technology or better, and shall be superior to conventional MOV-based or MOV-hybrid circuitry, such that it shall eliminate surge energy up to a minimum of 6,000 volts or better, without producing harmful side effects including earth contamination or common-mode disturbances. The protection mechanism shall utilize minimum non-sacrificial components or better, ensuring long operational life without performance degradation after repeated surge events. The enclosure shall be minimum NEMA-rated magnetic shielding steel construction or better, and the device shall be minimum certified to IEC/EN 61643-1 or better.

The unit shall provide minimum terminal strip input and output connections or better and shall incorporate a minimum self-circuit with visual status indicator or better, enabling immediate verification of operational condition. The device shall only be connected to a

minimum 20 Amp, 240 Volt single-phase AC circuit or better, and shall not be connected to two-phase 208 Volt or split phase 240 Volt services (such as 115-0-115 service), and any deviation from this electrical configuration shall be treated as non-compliant with installation requirements.

The electrical characteristics shall include minimum nominal line-to-neutral voltage (U0) of 240 V or better, minimum maximum continuous operating voltage (Uc) of 260 VAC or better, minimum voltage protection level (Up) not exceeding 1 kV or better, minimum maximum short-circuit current (Isc) rating of 3 kA or better, and minimum open-circuit voltage (Uoc) rating of 6 kV or better. The temporary overvoltage (TOV) characteristics shall withstand minimum UT = 335 V for duration tT = 5 seconds or better. The device shall have minimum degree of protection IP20 or better and shall be suitable for minimum TN, TT and IT power supply systems or better, and shall be rated for minimum indoor installation or better.

The unit shall provide minimum two ports or better and shall maintain minimum voltage regulation within ≤ 1% or better under normal operating conditions. The environmental operating conditions shall include minimum temperature range of −40°C to +35°C or better, and minimum relative humidity range of 30% to 90% or better, suitable for controlled indoor electrical environments. Country of origin, importer details and model identification shall be declared as part of submission documentation, and all certifications, compliance statements and electrical ratings shall be supported by official manufacturer documentation.

Technical evaluation shall be based strictly on completeness and conformity of submitted technical datasheets and certifications, and acceptance shall be subject to simultaneous compliance of all stated electrical, environmental and protection parameters. Partial compliance, substitution of protection topology, or omission of certified ratings may render the offer technically non-responsive. Installation shall be coordinated with the Electrical agency, and the device shall not be energized until approved as part of the overall electrical safety and protection scheme.

Annexure D

PROJECT OBJECTIVE AND SCOPE OF WORK

MPSAMB, intends to engage an experienced EPC Contractor to design, supply, install, integrate, operate, and maintain a comprehensive Communication & Broadcasting System across selected Agricultural APMC. The system will enable real-time information dissemination, data visualization, and content broadcasting to stakeholders, including farmers, traders, and APMC officials.

2. Broad Scope of Work for the Contractor

The RFP is to engage a service provider who has the capability to design solution including the supply hardware/software, with install, testing, operate, and maintain the proposed Smart Information broadcasting setup in shortlisted locations mentioned in (Annexure - J) throughout the contract period. The selected EPC Contractor shall be responsible for delivering a turnkey solution covering the following:

A. System Design & Engineering

- Detailed requirement analysis and preparation of a System Design Document (SDD).
- Designing the end-to-end architecture for:
- Data collection & integration
- Content publishing & scheduling
- Real-time broadcasting
- Data visualization dashboards
- Identifying hardware, software, and network requirements for seamless operations.

B. Supply, Installation & Commissioning

- Procurement and supply of all required hardware, software, and licenses.
- Mentioned solution to be deployed outside the APMCs open to sky or Inside the APMCs under the roof.
- Installation, configuration, and commissioning of:

Data Visualization Interfaces Centralized dashboard for monitoring APMC-level performance and activities. Real-time integration with APMC databases, agriculture schemes, and market data.

Content Publishing & Broadcasting Software

To publish government notifications, market prices, scheme updates, and relevant content.

Integration with multiple content formats: text, images, videos, and live announcements.

Display & Communication Devices *(if required)* at identified APMC for broadcasting information to farmers and stakeholders.

Internet would be provided by the respective APMC

C. Manpower Deployment

- The EPC contractor shall deploy dedicated **qualified technical manpower** for the designated APMC and for the central control room.
- Responsibilities of deployed manpower:
    - Daily operation & monitoring of the system.
    - Content scheduling and publishing.
    - First-level technical support and troubleshooting.
    - Regular reporting to the Department.

D. Operations & Maintenance (O&M)

- Comprehensive O&M support for the **entire contract period**.
- Ensuring **96% uptime** for all systems and interfaces.
- Regular **data backup, security patching, and software updates**.
- Providing a dedicated **Helpdesk Support System** to resolve technical and operational issues.

E. Training & Handover

Conducting **training sessions** for department officials and APMC operators on system usage and content management. Submission of **complete documentation**, including:

- User manuals
- Technical specifications
- Maintenance procedures

Sr. No.	Deliverable	Description	Timeline
1	System Design Document (SDD)	Detailed design and implementation plan	T+15 days
2	Procurement & Supply	Delivery of hardware, software, and licenses	T+45 days
3	Installation & Commissioning	Deployment of interfaces, software & dashboards	T+90 days
4	Manpower Deployment	On-site operational & technical resources	T+90 days
5	Training & Documentation	Complete handover with manuals and SOPs	T+100 days
6	O&M Support	Ongoing for contract duration	Continuous

T= Date of issue of Workorder.

4.1 Setting up the Smart Information broadcasting setup: this should have following provision:

A) Managed remotely by advanced content management software.

B) The proposed Smart Information broadcasting setup should have the data visualization Interface enclosure with the capability of protective outer layer made of robust weatherproof material so that information broadcasting setup keep performing and survive even in adverse weather conditions. Embedded enclosure should be the part broadcasting devise; the proposed data visualization Interface should be deployed to enable maximum visibility including authority's logo / messages on a weatherproof sticker which should be pasted on each enclosure below Display screen as per Authority's directions.

C) This setup should have the capability of centralize information management with the broadcasting of high quality of display data and it should have enough provision for bandwidth to support all remote locations.

D) The setup should enhance the efficiency and competitiveness of the services provided by the administration and move towards the sustainability of cities by improving resource efficiency.

E) This department is looking for Smart Information broadcasting setup in APMCs spread across Madhya Pradesh for quick access of Govt. validated information for the farming community, faster connectivity while providing a very rich information experience. The setup should be comprehensive solution including all required hardware, software's skilled manpower and O&M with data visualization interface.

F) Under the Smart Information broadcasting setup entire solution should have the centrally controlled data Visualization Interface with aesthetic excellence and must be compatible with a wide variety of built contexts. Designs will be evaluated on the basis of functional efficiency, aesthetics, security, durability, adaptability for various built environments and accommodation of people with disabilities. All designs are subject to the approval of the Authority.

G) All components of the data Visualization Interface under Smart Information broadcasting setup must be fabricated of high quality, durable, maintainable and weatherproof materials. To the maximum extent feasible, all surfaces of the Data Visualization Interface that are accessible to the public must be graffiti resistant. Wherever required, footings shall be embedded so that there are no surface plates to create a trip hazard.

H) If any connectivity is lost, the display should have the minimum internal memory to display the last programmed content repeatedly till the connectivity gets restored.

I) Contractor has to provide all Audio, Video, Power cables and connectors switch sockets / Networking Items if required.

J) performance or supervision of on-site assembly and/or start-up of the supplied Goods and services

K) furnishing of tools required for assembly and/or maintenance of the supplied Goods;

L) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods.

M) performance or supervision or maintenance and/or repair of the supplied Goods, for a period of

4.2 Solution Design of Data Visualization Interface

The Data Visualization Interface Platform of Smart Information broadcasting setup should bring together displays, technologies, multimedia, and collaboration into an integrated solution. The solution should allow Authority to disseminate, advertise, and create awareness for public about various information/details.

The solution should consist of computing and collaboration devices, management platform, and a network infrastructure to deliver content through displays and through Data Visualization Interface to end users in locations as specified in below mentioned in Annexure J.

Proposed Architecture of the Data Visualization Interface with Experience and should be managed by the central Manager.

Central management console will be used to remotely configure, control, and monitor Data Visualization Interface. Central manager should provide user management as well as real-time monitoring, live viewing of remote screen content, notification of events, and session management.

Data Visualization Interface computing devices under the proposed Smart Information broadcasting setup should support registration in the central manager either individually or in batches. Central Manager should be accessible through a web portal with a menu-based program. Central Manager should support Accounts creation to segregate users, devices, and policies. Users should be assigned to a particular account; they can then configure and manage the devices associated with that account. Manager should monitor Data Visualization Interface devices at regular intervals. The status of the devices should be collected within a period set by the user. Users should be notified when the status of devices in their account changes. Central manager should be able to group multiple devices in the portal as per the requirement.

Device logs should be sorted and analyzed by clicking the Events tab of a device. Similarly, the device's performance should be monitored by viewing the Performance report of a device. The software should be capable to send logs to a third-party server.

A policy is a restrictive mechanism, providing the user with a tool to enforce certain behavior. Policies represent dynamic and transportable setup rules. Policies can be persistent (long-term) or transient (short-term) and can be scheduled per Data Visualization Interface based on time or events.

4.4 Min Asked capabilities of the offered Solution:

A comprehensive Digital solution should incorporate a range of capabilities to meet the diverse needs of advertisers, content creators, and the citizens.

Should support management of Data Visualization Interface from a common platform.

Should use a user-friendly interface for scheduling, managing, and updating content. Support for various media formats (images, videos, animations, newsreels, live news, scroll, tickers, social media API feeds & PIP). Allow real-time content updates and remote management capabilities.

Should possess remote control capabilities for adjusting display settings, troubleshooting, and monitoring of hardware status.

Educate the user/viewer with relevant information in real time

Increase visibility into products and services offered

Increase revenues by providing a venue for approved third-party advertising to enable APMC self-sustainable

- Reduce costs with increased operational efficiency in customer and business processes
- Increase operational consistency by enabling reuse of existing web content
- Reduce use of management resources with remote manageability
- Reduce deployment and management timelines using policies and groups

Improve management experience with integrated solution architecture

Proposed Solution should have intuitive editing capability to create the effective content by adding various firming related items to the canvas by using drag and drop facility

Solution should have the inbuilt various recourses like Gen AI, Element and Widgets or similar tools The proposed solution should have the capability to create the designer user

friendly temples for faster and easy creation of effective content to enable system to create content using various types of templates tailored to each space and add widgets such as date, time, weather, and more. More efficiently with the flexibility to create content with less efforts. Solution should have the capability to create the roles to automate the content deployment also give option to control the remote device by setting the trigger conditions.

Annexure E

Requirement of Operations, Management & Maintenance for the offered system in all APMC

A) Selected contractors need to provision Operation & Maintenance for 36 months of the proposed setup from the date of installation till the Guarantee period gets over for the supplied Equipment's.

B) Project Implementation Agency will have to provision the following personnel to develop and manage the project on a full-time basis under O&M Period. It is mandatory for Min two technical resources to be placed dedicatedly for continuous monitoring and smooth execution of established infrastructure for the digital content broadcasting all APMC on turnkey basis of this project. Following are the minimum resources to be placed for the project execution.

B1. Project Manager-1 Nos: O& M period

The bidder has to appoint one Project Manager for the state level Central command control and coordination with all APMC covered under this project contract right from the start date of the Implementation of the project till the warranty period during this period PM has to provide periodic feedback and reporting to the concern Project in-charge nominated by the departmental competent authority. PM will be the key person from bidder side who will act as bridge between service provider and Departmental project execution team for coordination and reporting. PM should be stationed at State level project office and would involve in day-to-day consultation with the Departmental project coordination team and ensure complete implementation as per the requirement.

Education qualifications of Project Manager

- Post-Graduate in Computer Science/ Computer Applications
- Minimum 10 Years' project management experience (5 years in handling implementation projects related to IT Infra Service Solutions)
- Experience in implementation of largescale IT Infra projects.

B2. Coordinator to manage all APMC requirements during O& M period of 12 Months and 36 months

Bidder has to appoint two Coordinators / IT Support Staff for the end to end coordination and extending technical support to each APMC during the project during execution for the Operation & Maintenance knowledge transfer for the 1st year and after project handover one coordinator should be continued to take care of project coordination till the warranty period of 3 years to make sure smooth implementation, operation and management the project.

Bidder is to make sure the appointed Coordinators / IT Support Staff will ensure the successful implementation, Operation and Maintenance of the project.

Education Qualification and Experience of proposed manpower

- Graduate in any Technical discipline and 1-year Diploma or equivalent in IT field from any recognized/reputed institution.
- Minimum 3 years' experience (hardware software update and upgrade experience will be preferred)
- Well versed in basic IT infra operations
- Should have good communication skills especially in Hindi to coordinate and provide capacity building/handholding support as and when required

C) Prime Roles & Responsibilities of the Contractor

The Contractor / System Integrator has to provide the required Manpower for running and maintaining the day-to-day activities in each of the Digital Studios. The bare minimum deployment against each of the Studios shall be one who should be technically and professionally sound and shall be a fulltime dedicated resource for the purpose during the entire tenure of the Project right from the commencement day of O&M. Below mentioned are the KRA of the resources but not limited to.

Organizing the day-to-day activities of these APMC.

Handling with regular induction programs to be conducted for the local APMC staff or to other departmental staff utilizing the services of provided infrastructure.

Trouble shooting in case of any problem arising while performing the day-to-day activities.

For the first 3 months' min 6 training sessions are to be conducted for the APMC technical staff. District wise training may also be conducted on the need basis for the newly appointed Govt. team members for this project.

Arranging additional technical support from the System Integrator/ OEM. Which may be online or offline if required.

Timely raising and eradication of the risks or any technical glitches.

Timely updating the support to the deployed Software or Hardware upgradation/ repair/replacement.

Installation and Configuration of the required Hardware, Software and supporting infrastructure and its OEM upgradations.

To make sure Complete relay broadcasts of the State level important events conducted for State/Central level initiatives for farmers.

Managing all services on deployed Centralized command and control till the project warranty period is completed

System Integrator shall ensure all support of Infrastructure, Software or Hardware or manpower requirement in-order for smooth and uninterrupted execution of the project.

Apart from the deployed dedicated manpower if required System Integrator will arrange additional resources in case of big events and its broadcasts. In addition, the above stated resources will be deployed as per the defined mechanism however resources and expertise required for implementation of the project shall be the responsibility of the successful bidder to ensure the turnkey implementation of the desired scope.

The ATS (Annual Technical Support) and AMC (Annual Maintenance) of the Hardware, Software and complete BOQ deployed along with timely upgradation, implemented and configuration shall be in Scope of the System Integrator during the entire tenure of the contract period.

The resource/s shall be liable to have week offs and holidays as per the State Govt. rules.

Redundant resources shall be full responsibility of the System Integrator in case of unavoidable leaves of the deployed resource/s.

Annexure F

TECHNICAL BID

(To be submitted online only)

S.No.	Particulars	Tenderers Response
1.	Name and Address of the Tenderer	
2.	Note: The proposed communication and broadcasting system should conform to given specifications.	

Annexure G

Compensation for Delay

In case the work is not completed within the stipulated period of completion, including any extensions granted to the contractor for reasons such as the Employer's default or Force Majeure, compensation will be levied on the contractor at a rate of 0.05% per day of delay, limited to a maximum of 10% of the contract price.

The decision of the MPSAMB shall be final and binding upon both parties.

Annexure H

ORGANIZATIONAL DETAILS

(To be Contained in Envelope - A)

S. No.	Particulars	Details
1	Registration number issued by Centralized Registration System of Govt. of M.P. or Proof of application for registration.	(If applicable, scanned copy of proof of application for registration to be uploaded)
2	Valid Registration of bidder in appropriate class through Centralized Registration of Govt. of MP or Government of India & other state Government	Registration No. _____ Date _____ (Scanned copy of Registration to be uploaded) Validity of Registration up to Bid Submission End Date
3	Name of Organization/ Individual/ Proprietary Firm/ Partnership Firm	
4	Entity of Organization Individual/ Proprietary Firm/ Partnership Firm (Registered under Partnership Act)/ Limited Company (Registered under the Companies Act—1956)/ Corporation	
4a	If Other than Individual	Registration No. _____ Date _____ (Scanned copy of Registration to be uploaded)
4b	PAN No.	No ..... (Scanned copy of PAN to be uploaded)
4c	GST Registration No.	No ..... Date _____ (Scanned copy of Registration Certificate to be uploaded)
4d	EPF Registration	No ..... Date _____ (Scanned copy of Registration Certificate to be uploaded)
	ESI Registration	No ..... Date _____ (Scanned copy of Registration Certificate to be uploaded)
5	Address of Communication	
6	Telephone Number with STD Code	
7	Fax Number with STD Code	
8	Mobile Number	
9	E-mail Address for all communications	

S. No.	Particulars	Details
10	Name	
11	Designation	
12	Postal Address	
13	Telephone Number with STD Code	
14	Fax Number with STD Code	
15	Mobile Number	
16	E-mail Address	

Note: In case of partnership firm and limited company certified copy of partnership deed/ Articles of Association.

Annexure I

GENERAL CONDITIONS OF CONTRACT

1. Person(s) whose tender may be accepted [here in after called the contractor(s)] shall within 10 (Ten) days of the receipt by him/them of the notification of the acceptance of his/their tender, deposit a sum equal to 5% of the amount of offer for work as 'Performance Security'. All damages to be borne, or other sums of money payable by the contractor(s) to the MPSAMB under the terms of this contract may be deducted from or paid by the sale of sufficient part of his/their security deposit or from the interest arising there from or from any sums which may be due or may become due to the contractor(s) by the MPSAMB on any account whatsoever. In the event of his/their security deposit being reduced by the reason of any deduction or sale as aforesaid or by reason forfeited, the contractor(s) shall within ten days thereafter make good in cash or TDR/FDR endorsed as aforesaid any sum or sums which may be necessary to make the amount of deposit equal to the original 'Performance Security'. The contractor(s) is/are to provide everything of every sort and kind (with the exception noted in the schedule attached) which may be necessary and requisite for the due and proper execution of the several works included in the contract according to the true intent and meaning of the drawings and specification taken together, which are to be signed by the MPSAMB and the contractor(s) whether the same may or may not be particularly in the specification or shown on the drawings; provided that the same are reasonably and obviously to be inferred there from and in case of any discrepancy between the drawing and the specification the MPSAMB is to decide which shall be followed.
2. The contractor(s) is/are to set out the whole of the works in conjunction with an officer to be deputed by the MPSAMB and during the progress of the works to amend on the requisition of the MPSAMB any errors which may arise therein and provide all the necessary labour, and materials for so doing. The contractor(s) is/are to provide all equipment, labour and materials which may be necessary and requisite for the works. All materials and workmanship are to be the best of their respective kinds. The contractors is/are to leave to works in all respects clean and perfect at the completion there of.
3. Complete copies of the drawings and specification signed by the MPSAMB are to be furnished by him to the contractor(s) for his/their own use, and the same or copies thereof are to be kept on buildings in charge of the contractor's (s') agent who is be constantly kept on the ground by the contractors (s) and to whom the instructions can be given by the MPSAMB. The contractor(s) is/are not to sublet the works or any part thereof without the consent in writing of the MPSAMB.
4. The S.E. (This word means Superintending Engineer includes a Subordinate Engineer authorized or designated by MPSAMB) is to have at all times access to the works which are to be entirely under his control. He may require the contractor(s) to dismiss any person in the contractor's (s') employ upon the works who may be incompetent

or misconduct himself and the contractor (s) is/are forthwith to comply with such requirements.

5. The contractor shall not vary or deviate from the approved drawings or specifications, nor execute any extra work, unless authorized in writing by the S.E. Such authority must be shown either by a written order, a signed plan/drawing, or subsequent written approval by the MPSAMB.
6. Any authority given by the MPSAMB for any alterations or additions in or to works is not to vitiate the contract but all additions, omissions or variations made in carrying out the works are to be measured and valued and certified by the MPSAMB and added to or deducted from the amount of the contract, as the case may be. In such cases in which rates do not exist, the MPSAMB will fix the rates (based on proper analysis) to be paid.
7. All work and materials brought and left upon the ground by the contractor(s) or his/their orders for the purpose of forming part of the work are to be considered to be the property of the MPSAMB and the same are not to be removed or taken away by the contractor(s) or any other person without the special license and consent in writing of the MPSAMB but the MPSAMB is not to be any way answerable for any loss or damage which may happen to or in respect of any such work or materials either by the same being lost or stolen or injured by weather or otherwise.
8. The MPSAMB has full power to require the removal from the premises of all materials which, in his opinion, are not in accordance with the specification and in case of default the S.E. is to be at liberty to employ other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The S.E. is also to have full power to require other proper materials to be substituted and in case of default the S.E. may cause the same to be supplied and all costs which may attend such removal and substitution are to be borne by the contractor(s).
9. If in the opinion of the S.E. any of the works, are executed with improper materials or defective workmanship, the contractor (s) is/are when required by the S.E. forthwith to re-execute the same and to substitute proper materials and workmanship and in case of default of the contractor(s) is so doing within a week the S.E. is to have full power to employ other persons to re-execute the work and the cost thereof shall be borne by the contractor(s).
10. Any defects or faults that may appear within two (2) years from the date of completion and commissioning of the communication and broadcasting system, arising from defective or improper materials, equipment, or workmanship, shall be rectified and made good by the contractor at their own cost, as directed by the MPSAMB. If the MPSAMB considers that the contractor should be compensated for such rectification, payment may be made accordingly. In case of default by the contractor, the MPSAMB/Government of Madhya Pradesh reserves the right to recover from the contractor the cost of making good such defects.

11. From the commencement of the work to the completion of the same, they are to be under the contractor's(s') charge. The contractor(s) is/are to be held responsible for and to make good all injuries, damages and repairs occasioned or rendered necessary to the same by fire or other causes and they are to hold the MPSAMB harmless from any claims for injuries to persons or for structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the contractor (s) or of any one in his /their employ during the execution of the works
12. The S.E. is to have full power to send workmen upon the premises to execute fitting and other works not included in the contract for whose operations the contractor (s) is/are to afford every reasonable facility during ordinary working hours, provided that such operation shall be carried on in such a manner as not to impede the progress of the work included in the contract but the contractor(s) is/are not to be responsible for any damage which may happen to or be occasioned by any such fittings or other works.
13. The contractor shall start the work immediately after receiving the written order of commencement from the MPSAMB and possession of the site. The entire work, including approved additions and variations (except those postponed by the MPSAMB), must be completed within given period from the date of the commencement order, including the rainy season. If the contractor fails to complete the work within this period, except for delays caused by the MPSAMB or reasons beyond the contractor's control, liquidated damages shall be payable to MPSAMB (as decided by MPSAMB) and deducted from the security deposit, subject to a maximum of 10% of the contract value. The contractor may request an extension of time in writing within three days of the event causing delay, stating the reasons, and the S.E. may grant such extension at his discretion. If the work is not completed even within the extended period, the same damage shall apply.
14. If the contractor becomes bankrupt, arranges with creditors, assigns benefits to creditors, or suspends/delays the performance of the contract (except for reasons stated in Clause 13 or for lack of proper instruction duly requested), the S.E. may issue a notice requiring the contractor to resume the work. If the contractor, or their assignee/trustee, fails to do so within seven days, the S.E. may take possession of the works and engage other people to complete them, using the contractor's equipment, materials, and property available at site. All costs incurred for carrying out and completing the works shall be recovered from the contractor, and the decision of MPSAMB regarding the amount spent and the value of the balance work shall be final and binding on the contractor.

15. **Payment Schedule (The contractor(s) shall be paid after work is executed at different stages as under)**

(A) Payment for Supplying and Installation of Required Communication and Broadcasting System:

Stage	Condition	Percentage of Total Contract Value
Stage 1: Supply of Material	On delivery of the complete communication and broadcasting system and technical verification	60%
Stage 2: Successful Testing and Commissioning	Payment after the installation of the supplied equipment and services has been completed and tested, commissioned, and meets the tender parameters specified in the contract.	30%
Stage 3: Completion of 1 month of Operation and Maintenance Period and submission of PG	Payment after the successful completion of 1 month of operation and maintenance period.	5%
Stage 3: Completion of 2 months of Operation and Maintenance Period and submission of PG	Payment after the successful completion of 2 months of operation and maintenance period.	5%

(B) Payment for Operation & Maintenance including Manpower: 100 % Monthly Payment to would be made for the operation & maintenance including manpower.

Note:

1. **Approval of Payments:** All payments will be made only after approval of the third-party inspection agency appointed by MPSAMB.
2. **Pro-rata Payments Within Stages:** Payments may be released to the bidder on a pro-rata basis within all stages of work, as determined by the designated engineer-in-charge and subject to approval of the competent authority of MPSAMB.
3. **Taxes and Duties – Inclusive Pricing:** The lump sum offer quoted by the bidder must be inclusive of all applicable taxes and duties, including GST, custom duties, local taxes, and any other statutory levies. No additional payment toward such liabilities shall be entertained by the client. The bidder shall ensure full compliance and account for these obligations while quoting.
4. **Statutory Changes in Taxation:** Any future changes in tax rates or new statutory obligations imposed during the contract period shall be borne by the bidder without additional financial liability on the client.

5. **Tax Invoicing and Deductions:** The consultant shall issue the Tax Invoice showing the amount of CGST, SGST, IGST, as the case may be, separately. The TDS under GST, when applicable, shall be deducted 2% (1% CGST & 1% SGST) on the taxable value by MPSAMB. Other deductions like TDS under Income Tax, Labour Welfare Cess, etc., shall be deducted separately.

6. **Project Discontinuation – Payment and Deductions:** If the project is discontinued or aborted at any stage, the selected bidder shall be paid proportionately for the work completed up to that stage. Incentives and penalties, if applicable, shall also be calculated on a pro-rata basis for the complete months only.
7. **Quarterly Performance-Based Payments:** Quarterly payments shall be based on the monthly average performance over the quarter. In case the bidder fails to submit valid operational and processed quantity records for any month, the corresponding incentive/penalty for that month shall not be considered until verification by the concerned Mandi Samiti authorities or an authorized official.
8. **The payment shall be made if work is found as per normal.** All statutory deductions and recoveries like Income Tax, Labour Welfare Tax and GST etc. as applicable shall be made from the payments. Security Deposit shall be recovered 3% from all the payments. Payments either running or final made to the contractor does not relieve the contractor(s) from his/her liability under the provision of clause 10 whether the same be notified by the S.E./MPSAMB at the time of or subsequent to the payment.

16. A certificate of the S.E. or an award of the referee hereinafter referred to, as the case may be showing the final balance due or payable to the contractor(s) is to be conclusive evidence of the works having been duly completed and that the contractor(s) is/are entitled to receive payment of the final balance, but without prejudice to the liability of the contractor(s) under provision of clause 10.

17. Provided always that in case any question dispute or difference shall arise between the MPSAMB and the contractor(s) as to what additions, if any, ought in fairness to be made to the amount of the contract by reason of the works being delayed through no fault of the contractor(s) or by reason or on account of any directions or requisitions of the S.E. involving increased cost to the contractor(s) beyond the cost properly attending the carrying out of the contract according to the true intent and meaning of the signed drawings and specification, or as to the works having been duly completed or as to the construction of these presents or as to any other matter or thing arising under or out of this contract, except as to matters left during the progress of the works to the sole decision or requisition of the MPSAMB under clauses Nos. 1, 4, 8 and 9, or in case the contractor(s) shall be dissatisfied with any certificate of the S.E. under clause 6 or under the provision in clause 13 or in case he shall withhold or not give any certificate to which he/they may be entitled, or as to the right of the contractor(s) to receive any compensation or as to the amount of such compensation payable to him/them under clause 18, then such question, dispute or

difference or such certificate or the value or matter which should be certified, as the case may be, is to be from time to time submitted to the arbitration of a tribunal composed of one arbitrator nominated by the contractor(s) and one arbitrator nominated by the MPSAMB. In the event of a disagreement between the arbitrators on any matter or matters, such matter or matters shall be referred to an umpire to be nominated by MPSAMB/M.P. Govt, and the award of such arbitrators (umpire) is to be final and where necessary to be equivalent to a certificate of the C.E. and the contractor (s) is / are to be paid accordingly.

18. If at any time before or after the commencement of the work, MPSAMB, for any reason whatsoever, -

    (i) cause alterations, omissions or variation in the drawings and specifications involving any curtailment of the works as originally contemplated; or

    (ii) not required the whole of work as specification in the tender to be carried out, the contractor(s) shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he/they might have derived from the execution of the work in full as specified in the tender but which he/they did not derive in consequence of the curtailment of the works by reason of alterations, omissions or variations or in consequence of the full amount of the work not having been carried out.

19. The Contractor shall Operate and Maintain the Services for a period of 2 (Two) years after completion of the Work, Installation and Testing from the date the whole communication and broadcasting system is handed over to him for operation. During the period of operation and maintenance terms and conditions of 'Annexure: E' shall also be applicable.

Annexure J

Name of the APMCs:

क्रमांक	जिले का नाम	मण्डी समिति का नाम	मण्डी की श्रेणी
1	रायसेन	बरेली	A
2	भोपाल	भोपाल	A
3	छिन्दवाडा	छिंदवाड़ा	A
4	ग्वालियर	डबरा	A
5	गुना	गुना	A
6	होशंगाबाद	इटारसी	A
7	जबलपुर	जबलपुर	A
8	कटनी	कटनी	A
9	देवास	खातेगांव	A
10	होशंगाबाद	पिपरिया	A
11	सतना	सतना	A
12	बडवानी	सेंधवा	A
13	शाजापुर	शुजालपुर	A
14	जबलपुर	सिहोरा	A
15	टीकमगढ़	टीकमगढ़	A
16	हरदा	टिमरनी	A
17	विदिशा	विदिशा	A
18	खरगोन	भीकनगांव	B
19	राजगढ़	ब्यावरा	B
20	सागर	बीना	B
21	बुरहानपुर	बुरहानपुर	B
22	दतिया	दतिया	B
23	नरसिहंपुर	गाडरवारा	B
24	नरसिहंपुर	गोटेगांव	B
25	छतरपुर	हरपालपुर	B
26	नर्मदापुरम	नर्मदापुरम	B
27	नरसिहंपुर	करेली	B
28	हरदा	खिरकिया	B
29	सागर	खुरई	B
30	शिवपुरी	कोलारस	B
31	धार	कुक्षी	B
32	गुना	कुंभराज	B
33	राजगढ़	कुरावर	B
34	ग्वालियर	लश्कर	B
35	उज्जैन	महिदपुर	B

क्रमांक	जिले का नाम	मण्डी समिति का नाम	मण्डी की श्रेणी
36	धार	मनावर	B
37	इन्दौर	महू (अंबेडकरनगर)	B
38	अशोक नगर	मुंगावली	B
39	राजगढ़	नरसिंहगढ़	B
40	नरसिहंपुर	नरसिहंपुर	B
41	टीकमगढ़	निवाड़ी	B
42	सतना	नागौद	B
43	राजगढ़	पचौर	B
44	मंदसौर	पिपलिया	B
45	रायसेन	रायसेन	B
46	रतलाम	सैलाना	B
47	खरगोन	सनावद	B
48	इन्दौर	सांवेर	B
49	सिवनी	सिवनी	B
50	जबलपुर	शाहपुरा (भिटोनी)	B
51	श्योपुर	श्योपुरकलां	B
52	विदिशा	सिरोंज	B
53	छिन्दवाडा	सुसनेर	B

Signature Not Verified
Digitally signed by AJAY SINGH KUSHWAH
Date: 2026.03.28 17:21:22 IST
Location: Madhya Pradesh-MP