

**REQUEST FOR EXPRESSIONS OF INTEREST  
[CONSULTING SERVICES– FIRMS SELECTION]**

**INDIA – Uttarakhand Health Systems Development Project**

Loan No./Credit No./Grant No.: 5948-IN

**Assignment Title:** Development, Deployment, Hosting and Maintenance of Information Technology based e-Hospital Software Solution under the Uttarakhand Health System Development Project<sup>1</sup>

**Procurement Plan Reference Number: IN-UKHFWS-207620-CS-QCBS**

The Government of Uttarakhand has received financing from the World Bank toward the cost of the Uttarakhand Health Systems Development Project [UKHSDP]. The Uttarakhand Health and Family Welfare Society [UKHFWS] which is the implementing agency for the UKHSDP intends to apply part of the proceeds for consulting services.

The Consulting Services [“the Services”] include Development, Deployment, Hosting and Maintenance of Information Technology based e-Hospital Software Solution under the Uttarakhand Health System Development Project

The UKHFWS for the UKHSDP now invites eligible consulting firms [“Consultants”] to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services.

Request for Proposal [RFP] documents will be issued to shortlisted consultants.

**Shortlisting Criteria:**

For Shortlisting, the consultant should meet all the criteria (no. 1 to 8) as outlined below:

1. The Consultant/Joint Venture Members (in case of Joint Venture) should be an entity registered in India under the Company Act, 1956 (or) a firm registered under the Limited Liability Partnership Act, 2008 (or) a firm registered under the Partnership Act, 1932 for last 5 years as on 31st March, 2020, and must have a office in Uttarakhand, (preferably in Dehradun) which should be in operation before award of work. In case of a Joint Venture, the Lead Member would need to submit an agreement with the other members of Joint Venture for the contract clearly indicating the division of work and their relationship.

***Document/s:***

*Certificates of Incorporation / Joint Venture Agreement*

<sup>1</sup> <http://www.ukhsdp.org/assets/pdf/project-appraisal-document.pdf>

2. The Consultant/Joint Venture must have a proven capability in design, development, hosting, integration, implementation, operations and maintenance of “Live” Health Information Systems / e-Hospital Software systems and Healthcare Solutions (i.e. HIS, EMR, EHR) across large hospitals / healthcare facilities or networks of hospitals / healthcare facilities and should be handling / managing database of at least 1,00,000 unique patient records (in format as per the EHR Standards and being compatible for aggregation, semantic interoperability etc.) as on date of submission of EOI. The HIE / HIS System should be for exchange between two or more disparate databases (HIS) of hospitals / networks of hospitals and should be capable of high-volume exchange of data, meta data, scanned documents image etc.

***Document/s:***

Satisfactory Completion of Works Certificates from the client(s) confirming the year of work, scope of work and work order details;

**OR**

Work Order + Phase Completion Certificate from the client(s) for the ongoing “Live” projects with their scope of work

3. The Consultant/Lead Member (in case of Joint Venture) must have executed a single project of total value at least Rs 2.50 Crore (INR Two Crore fifty lacs) (excluding hardware) in design, development, hosting, integration, implementation, operations and maintenance of HIE or Healthcare Solutions (i.e. HIS, EMR, EHR) in last five years.

***Document/s:***

Work Order + Completion Certificate from the client(s) for completed project with their scope of work

4. The Consultant/ Lead Member of Joint Venture should have Positive Net Worth as on 31<sup>st</sup> March 2020

***Document/s:***

Audited and Certified Balance Sheet of last 3 Financial Years (2017-18, 2018-19, 2019-20)

**AND**

Certificate from Chartered Accountant and Authorized Signatory

5. Average annual turnover of the Consultant/ Joint Venture during the last three financial years 2017-18, 2018-19, 2019-20 from below mentioned Health-IT business streams (excluding turnover from hardware) should be at least Rs. 10 Crore (INR Ten crore) (as per the published Income Statement): Healthcare Information System enabled systems covering data integration, data warehousing and data management. In case of Joint Venture, average annual turnover of each of the members during the last three financial years 2017-18, 2018-19, 2019-20 from the above-mentioned Health-IT business streams (excluding turnover from hardware) should be at least Rs 2.5 Crore (INR Two Crore Fifty Lac) (as per the published Income Statement). In case of calendar year, 3 years up to March 2020 would be taken in to account.

***Document/s:***

Certificate from statutory auditor appointed by the company (of last 3 Financial Years (2017-18, 2018-19, 2019-20))

6. The Consultant/Joint Venture Members should have a valid GST Registration and Income Tax returns and PAN card.

***Document/s:***

Copy of GST Registration &

Income Tax return last 3 financial years (till 2019-20)

Audit Report from CA for last 3 financial years (till 2019-20)

Copy of PAN Card

7. The Consultant/Joint Venture Members should not be under a declaration of ineligibility for corrupt and fraudulent practices issued by any of the Central or State Government Ministries / Departments, and should not have violated / infringed upon any Indian or foreign trademark, patent, registered design or other intellectual property rights.

***Document/s:***

Undertaking (Self Certification) on company letter head certified by authorized signatory.

8. The Consultant/Lead Member (in case of joint venture) should be CMMI Level 5 certified.

***Document/s:***

Copy of the certificate from authorized certifying agency. The certificate should be valid as on 31<sup>st</sup> March 2020.

The attention of interested Consultants is drawn to paragraph 1.9 of the World Bank's Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers, January 2011 and revised July 2014 ["Consultant Guidelines"], setting forth the World Bank's policy on conflict of interest.

A consultant will be selected in accordance with the Quality and Cost Based Selection [QCBS] method set out in the Consultant Guidelines.

Consultants may associate with other firms in the form of a joint venture or a sub-consultancy to enhance their qualifications but should indicate clearly whether the association is in the form of

a joint venture (with a maximum of three members) and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.

To participate in the e-tendering process, a firm is required to enroll on the e-Procurement module of the Uttarakhand e-tender Portal [URL: <http://uktenders.gov.in>] free of charge.

The REOI is available online at Uttarakhand e-tender portal <http://www.uktenders.gov.in> from December 14, 2020 to January 11, 2021 [up to 15.00 hours IST] for viewing/downloading free of cost.

Expression of Interest [EOI] must be submitted online only at <http://uktenders.gov.in> by or before January 11, 2021 [up to 15.00 hours IST]. EOI submitted through any other mode shall not be entertained.

Further information can be obtained at the address below during office hours [*i.e., 1000 to 1700 hours*].

Project Director  
Uttarakhand Health Systems Development Project  
2<sup>nd</sup> Floor, Red Cross Building,  
Village: Danda Lakhaund, P.O.: Gujrada,  
Sahastradhara Road,  
Dehradun  
Uttarakhand PIN- 248001  
INDIA  
Phone : 91 11 1352607610  
E Mail – [apd.ukhsdp@gmail.com](mailto:apd.ukhsdp@gmail.com)

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## **Response Formats**

### **FORM I: COVERING LETTER**

[On Company Letterhead]

[Location, Date]

To:

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*Subject: Expression of Interest for the Development, Deployment and Maintenance of Information Technology based e-Hospital Software Solution under the Uttarakhand Health System Development Project*

Dear Sir,

We, the undersigned, offer to for “Development, Deployment and Maintenance of Information Technology based e-Hospital Software Solution under the Uttarakhand Health System Development Project” with your Request for Expression of Interest dated [\_\_/\_\_/2020] and our response.

2. Primary and Secondary contacts for our company are:

	<b>Primary Contact</b>	<b>Secondary Contact</b>
<b>Name</b>		
<b>Title</b>		
<b>Company Name</b>		
<b>Address</b>		
<b>Phone</b>		
<b>Mobile</b>		
<b>Fax</b>		
<b>e-Mail</b>		

3. We are hereby submitting our Expression of Interest (EOI) on Uttarakhand e-tender Portal [URL: <http://uktenders.gov.in>]. We understand you are not bound to accept any EOI you receive.
4. We confirm that the information contained in this response or any part thereof, including its exhibits, and other documents and instruments delivered or to be delivered to UKHFWS/UKHSDP is true, accurate, verifiable and complete. This response includes all information necessary to ensure that the statements therein do not in whole or in part mislead the department in its short-listing process.
5. We fully understand and agree to comply that on verification, if any of the information provided here is found to be misleading the short-listing process or unduly favour our company in the short-listing process, we are liable to be dismissed from the selection process or termination of the contract during the project, if selected to do so, for undertaking the work to Development, Deployment and Maintenance of Information Technology based e-Hospital Software Solution under the Uttarakhand Health System Development Project

6. We agree to abide by the conditions set forth in this EOI.

7. It is hereby confirmed that

*I / We are entitled to act on behalf of our corporation /company / firm / organization and empowered to sign this document as well as such other documents, which may be required in this connection.*

Dated this,                      Day of, 2020

(Signature) (In the capacity of)

Duly authorized to sign the EOI Response for and on behalf of: Sincerely,

[Name]

[Title Signature Date]

(Name and Address of Company) Seal/Stamp of the Company(s) / Lead Consultant

**CERTIFICATE AS TO AUTHORISED SIGNATORIES**

I, ....., certify that I am .....  
of....., and that ..... who  
has signed the above response is authorized to bind the Company/Firm by  
authority of its governing body.

[Date]

(Name and Address of Company) Seal/Stamp of the Company(s) / Lead Consultant

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## **FORM II: GENERAL DETAILS OF THE ORGANISATION**

### **Details of the Organization**

Name of organization

Nature of the legal status in India

Legal status reference details

Nature of business in India

Date of Incorporation

Date of Commencement of Business

Address of the Headquarters

Address of the Registered Office in India

Other Relevant Information

### **Mandatory Supporting Documents:**

- a) Power of attorney for authorised signatory
- b) Certificate of Incorporation from Registrar of Companies (ROC)
- c) A certificate from the Chartered Account must be attached as a proof of annual turnover of the Company / Joint Venture Members for last 3 financial years (till FY2019-20).
- d) A certificate from the Chartered Account must be attached as a proof of positive Net Worth as on 31<sup>st</sup> March 2020
- e) Undertaking (Self Certification) that the Company(s) / Members of Joint Venture has never been engaged themselves in any corrupt and fraudulent practices and has never been blacklisted by any Central /State Government Departments.
- f) Company(s) / Members of Joint Venture should not have violated / infringed upon any Indian or foreign trademark, patent, registered design or other intellectual property rights. A self-certificate should be provided by the consultant.



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## FORM III: FINANCIAL DETAILS OF THE ORGANIZATION

### Financial Information

	2017-18	2018-19	2019-20
Revenue (in INR crores)			

from Health-IT businesses (excluding turnover

from hardware) from the following three

business streams:

Healthcare Management Information System enabled systems covering data integration, data warehousing and data management.

Profit Before Interest, Tax, Depreciation &

Amortization (in INR crores)

Any Other Relevant Information

Mandatory Supporting Documents:

Audited and Certified Balance Sheet of last 3 Financial Years (2017-18, 2018-19, 2019-20) must be attached. The Net worth of the company should be positive as on 31/03/2020.

## **FORM IV: SIMILAR PROJECT EXPERIENCE**

### **Project Experience**

General Information

Name of the project

Client for which the project was executed

Name and contact details of the client

Current Status

### **Project Details**

Description of the project

Geographical Scope

Outcomes of the Project

Applications

Technologies Used

Infrastructure

Operations and Services

Number of Locations / Sites

### **Other Details**

Duration of Implementation (post selection)

Total Duration of the project (no. of months, start date, completion date)

Total cost of the project

Total cost of the services provided by the Consultant

Other Relevant Information

### **Mandatory Supporting Documents:**

- a. Work Orders / Client Certificate (including the cost details of the project excluding hardware components) confirming year and domain of activity should be attached. Supporting documents for cost of project undertaken to be provided. In case of foreign currency projects, the project value should be shown in INR as per the conversion rate prevailing at the time of award of the work order.
- b. The Consultant(s) / Joint Venture should produce the “satisfactory completion of works certificate” from the clients in reference to the works they have cited.
- c. Complete details of the scope of the project should be provided to indicate the relevance to the prequalification criterion (which is part of minimum qualification criteria).

## **Terms of Reference (ToRs) – Consultant Firm**

**Assignment Title:** Development, Deployment, hosting and Maintenance of Information Technology based e-Hospital Software Solution under the Uttarakhand Health System Development Project<sup>2</sup>

### **1. Introduction to the Project**

Uttarakhand Health Systems Strengthening Project [UKHSDP] is conceived as a strategic initiative to enhance people's access to quality health care services in the state of Uttarakhand. The Project is financed by the World Bank and implemented by Uttarakhand Health and Family Welfare Society [UKHFWS]. The project seeks to support Uttarakhand in improving access to quality health services and in providing health financial risk protection. Specifically, the project would focus on improving access to health services for the predominantly remote population of the state, through strengthening public and private health-delivery systems; promoting greater stewardship and managerial capacity in the health directorate; improving information systems; augmenting monitoring and research; and extending coverage of state health insurance scheme beyond hospitalization to include primary healthcare services.

The project has two components: a) Innovations in engaging the private sector [for integrated service delivery and for health financing], and b) Stewardship and health systems improvement. A description of the activities under the two project components is provided below.

Project Development Objective (PDO) is to improve accesses to quality health services, particularly in the hilly districts of the state and to expand health financial risk protection for the residents of Uttarakhand

#### **Project Components**

**I. Component 1. Innovations in engaging the private sector:** Innovations in engaging the private sector would finance engagement with the private sector in the delivery of healthcare services as well as in healthcare financing. This component expand access to services by creating integrated, technology-enabled health system architecture with enhanced focus and availability of primary care, emergency care and necessary referral services. It also expand financial protection by defining a benefit package of primary care services for child and adolescent health care and for the management of non-communicable diseases.

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<sup>2</sup> <http://www.ukhsdp.org/assets/pdf/project-appraisal-document.pdf>

**II. Component 2. Stewardship and system improvement:** This component strengthens the government's capacity to engage effectively with the private sector, and therefore, to enable the government to provide effective stewardship to improve the quality of services in the entire health system and particularly in its capacity to effectively pursue the innovations being planned under this project. The component focus on strengthening the institutional structures for stewardship and service delivery and augmenting the state's human resource capacity, so that the necessary skill sets required for effective implementation of the project and the state's health programs are available. The strengthened capacity serve beyond the activities of this project, as it contribute to the government's stewardship role for the health system. It support research and evidence generation, use of evidence for strategic planning, and improved information systems for data generation and management, including timely feedback to providers. It also support Facilities Assessment as well as contracting of agencies on a turnkey basis to support the attainment of NABH quality standards in identified public health facilities in the state. Finally, the component promote a multidisciplinary approach that strengthens the ability of the health system to respond to seasonal and context-specific needs. Project management costs also be financed from this component.

## **2. Background**

2.1 Creation of EHRs of citizens and establishment of supporting infrastructure / mechanism for exchange of health records emerges as one of the key focus areas under the plan for comprehensive use of ICT in healthcare. Accordingly, in the meeting of e-Health Task Force on 22nd Oct 2020, it was deliberated and decided to "Design & Develop e-Health Framework and to provide e-Hospital Software Solution" primarily focusing on interoperable EHRs and subsequently to encompass other key components of e-Health, as feasible.

2.2 It has been observed those healthcare organizations are mostly operating in data-rich but information-poor environment. Patient health data is being gathered / stored - distributed over a number of locations and via a number of IT solutions - which is generally inaccessible, improperly formatted / not standardized and hence not interoperable. System interoperability along with supportive IT frameworks and optimal information exchange to support better healthcare services and thus outcomes is the key requirement in the prevailing scenario. Also need is there for transforming data into information and evidence, which could help in decision support systems (DSSs).

2.3 Multiple data sources need to be integrated in meaningful ways to improve services in relation to access, quality, user satisfaction and efficiency. With information sharing, volumes of independent sets of data across multiple systems can be brought together in integrated, relevant and useful summary views. Integrated data can be de-identified and aggregated in such a way to enable policy-making decisions at public health level. The current focus is more on “pushing” vs “pulling” data, which often leads to ineffective data sharing and impedes care quality and efficiency impacting outcomes. Common fallacies observed in data management currently are:

- Fragmented information streams / systems
- Quality of data
- Large volume of data collected
- Duplication of data collection – Data Redundancy
- Sub-optimal resource utilisation due to duplicate information systems
- Lack of interoperability and accessibility of information
- Lack of unique identifiers for patients, providers and health facilities
- “Push” vs. “Pull” model of data sharing
- No common EHR system

2.4 It is essential that information can be accessed from anywhere in the health system to facilitate seamless communication in between different stakeholders like patient-to-provider, provider-to-provider, provider-to-health managers / government agencies, government / provider-to-academia etc. Data should only be recorded once, at its source (single instance capture), the systems need to be sustainable, data must be standardized and understandable and the system needs to be available locally.

2.5 For effective adoption of information and communication technologies (ICT) in Uttarakhand healthcare system- aligned with health sector goals under Digital India Programme - need for integration of and interoperability amongst various Health IT systems and creation of electronic health records (EHRs) of citizens along with pan-India exchange has emerged critical. Most of the patient records have a decentralized storage and gets trapped in multiple silos such as primary care, specialist, hospitals, pharmacy, home health care etc. Keeping these issues in view, DoMH&FW, Government of Uttarakhand has decided to have an e-hospital solution.

e-Hospital Software Solution is envisaged to work in the direction of enabling creation of the electronic health records (EHRs) of citizens and making EHRs available nationwide (through exchange mechanism) with the help of a centralized accessible platform. This would facilitate continuity of care, confidential and secure health data / records management, better affordability, optimal information exchange to support better health outcome, better decision support system, fewer redundancies and medical errors, low data redundancy, big data analytics etc. A framework and mechanism for unique identification for patients, healthcare providers / organisations and medical procedures would be incorporated so as interoperability (and thence longitudinal aggregation of electronic medical records) is attained amongst different Health IT Systems.

2.6 e-Hospital Software Solution is proposed to encompass various components. Business model for e-Hospital Software Solution has been envisaged on the basis of a set of guiding principles.

2.7 For e-Health applications - Healthcare Management, Electronic Medical Records (EMR), Electronic Health Records (EHR)- on e-Hospital, tried and tested solutions offered by third parties (both public and private IT vendors) and complying with EHR Standards (notified by MoHFW) and other e-Governance Standards (notified by Department of Electronics & Information Technology-DeitY).

2.8 The various regulatory aspects like privacy, security, access, disclosure, exchange etc. would be taken care of by DoMH&FW, Government of Uttarakhand. DoMEFW would also regulate other specifics like what information to be shared, within what timeline the information should be shared etc.

### **3. Objectives e-Hospital and Outcome envisaged**

The overall and ultimate purpose of design and development of e-Hospital is to facilitate better health services to citizens, improve efficiency for healthcare services and health programmes by optimum utilization of resources, availability of information / data – in secure manner and on real time

The specific objectives envisaged to be achieved through e-Hospital include:

- To leverage information and communication technologies (ICTs), aligned with health care goals under National digital Health Mission (NDHM) and National digital Health Blueprint (NDHB).

- To set-up a e-Hospital Software Solution on Cloud which has integrated and interoperable standards compliant and healthcare management applications along with infrastructure / services for health information highway
- To enable real time collection and aggregation of data in an efficient and effective manner and to facilitate exchange of data across systems and stake-holders by establishing a framework for unique identification for patients, providers/health facilities and medical procedures.
- To facilitate improvement in quality / continuity and affordability of care through interoperable EHRs and better utilization of resources
- To enable effective and efficient management of population health through real time aggregated data

The key outcomes / benefits envisaged from e-Hospital for different stake-holder groups include:

<b>Stake Holder Group</b>	<b>Outcomes / Benefits</b>
Citizen / Patient	<ul style="list-style-type: none"> <li>• Continuity of care</li> <li>• Confidential and secure health data / records management</li> <li>• Better affordability-by avoiding redundant examination / tests / procedures</li> </ul>
Healthcare Providers	<ul style="list-style-type: none"> <li>• Availability of real time and standardised data / information</li> <li>• Optimal information exchange to support better health outcome</li> <li>• Better decision support system</li> <li>• Fewer redundancies and medical errors</li> </ul>
Government/ Health Managers	<ul style="list-style-type: none"> <li>• Better and smoother management of billing and claims processes</li> <li>• Enhanced precision and speed of coverage payments to healthcare service</li> <li>• Better analysis of cost-effectiveness of coverage policies</li> <li>• Business intelligence and more sophisticated data analysis towards better coverage policies planning etc.Reduced duplication of data (single instance capture) - low data redundancy</li> <li>• Less fragmentation and more standardisation health information systems</li> <li>• Strengthening of evidence base for effective policies</li> <li>• Big data analytics – Dashboards for Monitoring and Evaluations facilitating effective decision making</li> </ul>

### 3. Components and Architecture of e-hospital

The various design aspects – in line with the prevailing challenges - considered while conceptualizing e-Hospital include the following:

- Integration of multiple systems – primarily patient centric- working in silos
- Data capturing at source in digital format
- Sharing and aggregation of quality data with minimum latency across applications and stake-holders
- Availability of uniquely identifiable, easily traceable and verifiable data / records in the system
- Access to quality data to health managers, policy makers etc. capturing various parameters linked with determinants of health for effective and efficient healthcare delivery

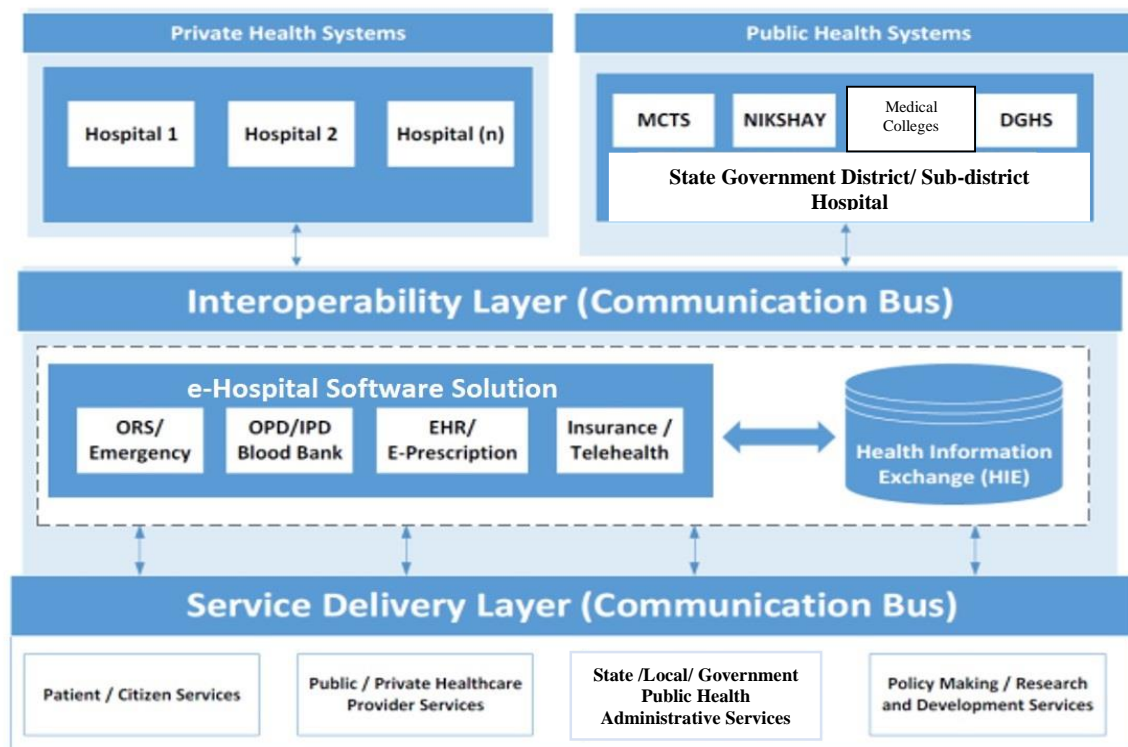
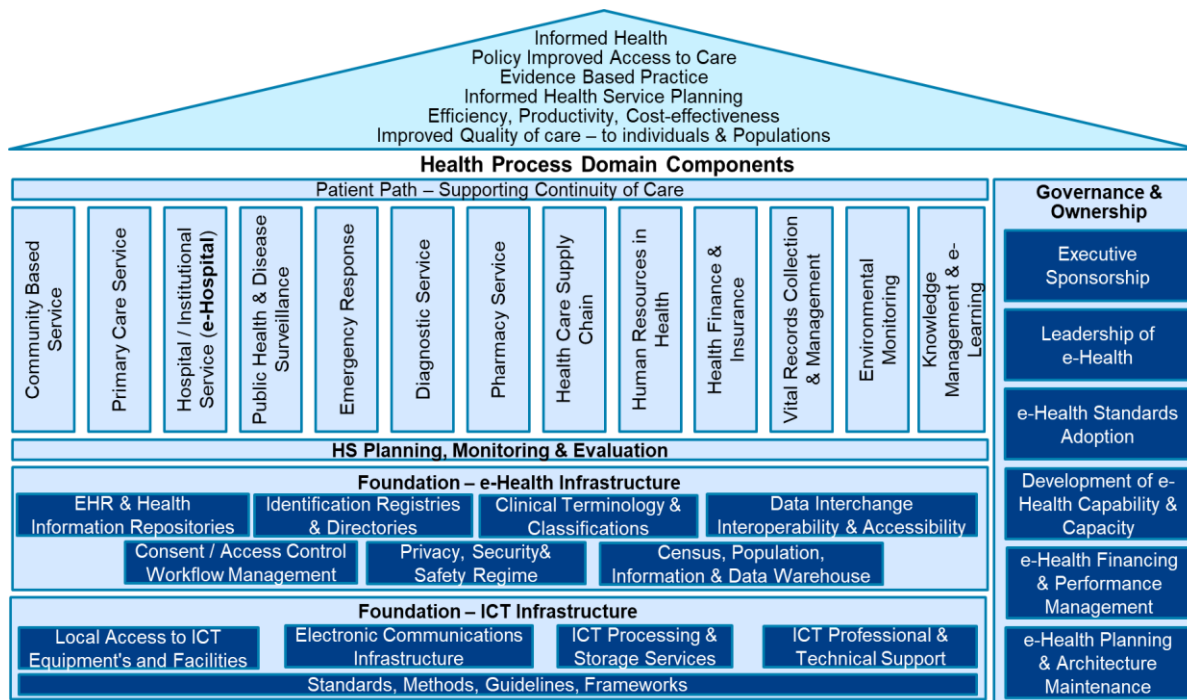
In line with the envisaged objectives, e-Hospital is proposed to encompass various components grouped as e Health applications - describing tools and systems that will be used by users to interact with the system or for data processing; e Health data - describing major data items and data that will be shared between components; and e Health infrastructure: describing computing infrastructure required to support e Health solutions.

Category	Brief
e-Health Applications	
Application / Solution	<ul style="list-style-type: none"> <li>• To meet various requirements related to creation of EHR through ‘suite for digital health records creation and management’ consisting of:               <ul style="list-style-type: none"> <li>○ Hospital information management / Clinical administration / Electronic medical records</li> <li>○ Remote patient monitoring – through internet-of-things; wearable devices, M2M technologies etc.</li> <li>○ Telehealth through wider e-health framework</li> <li>○ Hospital billing/ payment, insurance claims etc.</li> <li>○ Patient communications – SMS, emails, voice</li> <li>○ Business intelligence and Analytics etc.</li> </ul> </li> </ul> <p>For eHealth applications on e-Hospital, tried and tested solutions offered by third parties (both public and private IT vendors) and complying with EHR Standards (notified by MoHFW) and other e-Governance Standards (notified by Department of Electronics &amp;</p>



	<p>Information Technology-DeitY) would be hosted on e-Health Framework &amp; e-Hospital Various developers including innovative start-ups can host their standards compliant applications / solution-suites on e-Health Framework &amp; e-Hospital after due process of evaluation by the DoMH&amp;FW.</p> <ul style="list-style-type: none"> <li>• Also, to include Public Health Applications / Systems having interface with patient / citizen health records –those related to disease control / immunisation like Mother and Child Tracking System, TB Control Pogramme etc.</li> </ul>
Information Exchange	<ul style="list-style-type: none"> <li>• To facilitate exchange of information between different EMR systems</li> <li>• To connect to a database in which the medical records of the patients are collected from multiple providers and consolidated together</li> <li>• Exchange between patients, healthcare providers, payers, medical data providers</li> </ul>
<b>eHealth infrastructure</b>	
Hosting environment and Database management	<ul style="list-style-type: none"> <li>• Hosting of servers, application, database- on “Cloud” for online and at local level for offline work hybrid mode</li> <li>• User of e-Health Framework &amp; e-Hospital doesn’t need to own servers / storage / database for online use</li> </ul>
Standards	<ul style="list-style-type: none"> <li>• Compliance of applications to EHR Standards, Open Source Software Policy, Open API Policy, other relevant e-Governance Standards</li> </ul>
Privacy and Security	<ul style="list-style-type: none"> <li>• Patient consent / permissions</li> <li>• Disclosure management</li> </ul>
eHealth data	
Registry / Identifiers	<ul style="list-style-type: none"> <li>• Unique identifiers for patients, providers, health facilities</li> </ul>
Repositories	<ul style="list-style-type: none"> <li>• Health records</li> </ul>

A conceptual diagram representing the fundamental organization of e-Health Framework & e-Hospital’s components, their logical relation to each other / other systems and their inter-dependencies has been outlined and presented as below. These components need to interact amongst themselves according to a certain plan or design.



**Conceptual Diagram's of e-Health Framework**

#### **4. Scope of Work:**

4.1 The scope of work encompasses:

- Design and Development of e-Hospital Software Solution as per NDHM & NDHB guidelines and must comply EHR, EMR, PHR and other standards of e-Health.

This frame work must include the following:

- E-Hospital Module
- Administrator Module
- Federated registries
- EHR/EMR/PHR and Health Information Repositories
- Identification Registries & Directories
- Clinical Terminology & Classifications
- Data Interchange Interoperability & Accessibility
- Consent / Access Control Workflow Management
- Privacy, Security& Safety Regime
- Census, Population, Information & Data Warehouse
- Primary Care Service
- Public Health & Disease Surveillance
- Emergency Response
- Diagnostic (Laboratory and Radiology) Services
- Pharmacy Service
- Health Care Supply Chain
- Human Resources in Health
- Health Finance & Insurance
- Vital Records Collection & Management
- Environmental Monitoring
- Knowledge Management & e-Learning

- Integration of existing e-Health initiative of Government of India & Government of Uttarakhand
  - Must be compatible with this National Identification Number
  - Analytical Module
  - Framework must be complying modular approach, in which another module will fit in as and when they will develop and ready.
  - Provide Maintenance, support and upgrades for 5 years
- b) Implementation pilot it for atleast one category of health care facility in a district i.e. Medical Colleges, District Hospitals, SDH, CHC, PHC and sub center level, thereafter rolling out in other districts.
- c) It is must be run in hybrid mode (offline & online) depends on situation.

4.2 The agency/firm should provide and maintain the solution in agreement with the following features:

#### **4.2.1 Accessibility**

- a) A hybrid (online & offline) approach distributed and centralized web-based cloud compliant application with a simple and user-friendly graphical user interface (GUI) for easy and fast mode of operation and usability. The application should be accessible by any Healthcare Service Provider organizations (both public and private), healthcare professionals, government and citizens via laptop, desktop, mobile applications on wired or wireless connectivity.

***Note:** A comprehensive solution document consisting of the technical architecture solution for handling connectivity scenario, data handling capabilities / data sizing should be corresponded. Offline mode of operation needs to be proposed by the selected consultant.*

- b) The e-Hospital Software Solution will offer interface with various functional modules across different standards compliant. The various modules of e-Hospital as offered by third parties would include EHR related modules. An indicative list of such modules is given as below (the list is non-exhaustive):

1. Front Desk Management
2. IPD Management
3. OPD Management
4. CSSD - Central Sterile Supply Department
5. Radiology
6. Laboratory
7. Blood Bank
8. Medical Record Room
9. Kitchen & Dietary Management
10. Laundry
11. House Keeping
12. Purchase Management
13. Inventory Management
14. HR Module
15. Equipment Maintenance & Fixed Asset Management
16. Finance and Accounts
17. Business Intelligence & MIS
18. System Security, Admin & MIS
19. Any other module identified at later stages.

**Note:** *The above is non-exhaustive.*

e-Hospital would also require to ensure interface / data exchange (through middleware as needed) with other e-Health applications of e-Health framework, which are not EHR Standards compliant, in order to ensure continuity of health records.

- c) Our vision is to assign Unique Health Identifier (UHID) to individuals-proposed to be linked with the ADHAAR number and personal mobile number and unique identifier for Healthcare Providers / Professionals.
- d) Online account access via citizen portal hosted on e-Hospital as part of e-Health Framework and e-Hospital application, for every citizen through which the past medical history / health record could be viewed, edited

(except deletion) and uploaded by the citizens themselves in EHRs. Additionally, the portal should be capable of capturing patient / citizen's health data from various wearable devices and mobile application(s).

**Note:** *Users would not be allowed to perform Delete operations across the e-Hospital application. However, archival of the data would be permissible.*

- e) Generation of analytics dashboards and reports via analytics tools for different types of analytics using anonymized health data in order to facilitate effective policy-making decisions for public health at department & state level etc.

#### **4.2.2 Interoperability**

- a) Platform architecture should be open, flexible and dynamic in nature with easy application programming interface (API) communication with other health information sources including of various hospitals, laboratories, physician clinics, Emergency Ambulance services, AYUSH, MCTS, NIKSHAY-TB, IDSP, CGHS, and other third party EHR application(s) permitted only after due process of evaluation and approval of DoMH&FW.

**Note:** *The selected firm/agency would be expected to understand and identify the interface requirements including an API toolkit for integration between the existing as well as proposed solution.*

- b) Generation of standards compliant Electronic Health Record (EHR) for every citizen. The application should perform real-time collection and aggregation of patient specific clinical data trapped in multiple silos from various sources including EMR modules of other health systems at hospitals, individual physicians and other health professionals in order to improve quality of care by reducing duplication and manual transmission of data across different stakeholders/providers/hospitals.
- c) A centralized storage layer, as required, of Health Information Exchange (HIE) for storing the heavy image data records (like X rays, CT scan, MRI, ECG, and Angioplasty) and consequently generating a link / metadata of the image data records for the health institutions in order to access these records. The health institutions may have local storage of such data for a given period of time in addition to the centralized storage of the heavy

image data records. In cases of patients getting referred to another hospital, the data captured from the hospital referred would be available in storage layer.

- d) Generation of timely alerts and notifications via Emails, Voice and SMS to all stakeholders. SMS Gateway should support both “Push and Pull” services.
- e) Enterprise class master data management software, which will help to create a unique/ true copy of data removing all de-duplication of patient specific clinical / non-clinical health data from the database in order to enable ease of data warehousing and data management.

#### **4.2.3 Scalability**

e-Hospital Software Solution with concurrent adoption in pilot locations is envisaged over timeframe

***Note:** The application should allow easy addition of new functionality or features with minimal changes to the existing application.*

#### **4.2.4 Security**

The e-Health Framework & e-Hospital Software Solution should have adequate level of data privacy, cloud portability, and secure interoperability of data, when stored or retrieved or transmitted across the Health IT systems.

#### **4.2.5 Audit Log**

Maintenance of audit trail which would be a detailed record showing all the user-defined events of the application and the transactions / operations performed by the concerned user during a given period of time. Audit log must display the following details, but not limited to, with filter / sorting criteria options: (the list is non-exhaustive)

- Patient ID and User Name
- Module
  - Sub Module
  - Screen
  - Section
  - Field

- Name Date and Timestamp
- Updated Value
- Activity Performed

**Note:** *The audit log should be updated as per the mandated rule / law by GoI and GoUK at any time.*

## **5. Task to be completed**

The tasks to be undertaken by the Consultant to fulfil the objectives, in consultation with the Project Implementation Team [PIT] of the UKHFWS include but are not limited to the following phases

### **Task I: Development phase**

- i. Support the GoUK in identifying the requirements and priorities for e health deployments to support Medical Colleges, District Hospitals, SDH, CHC, PHC and Sub-centre.
- ii. Ensuring that standards are developed and adopted according to GoI guidelines and to suggest cost effective service implementation.
- iii. Developing the network adapting learning from existing models.
- iv. Develop following as described in 4.1 and 4.2.b).

### **Task II. Deployment phase**

In continuation with the development phase, this phase will include availability of requisite number of technical human resource for specified time period (as per table 2) based on strategy, framework and policy as per GOI policy document and Framework for the Implementation of a e health strategy across the state.

### **Task III Training and Management Phase**

#### **III a. Training**

The Consultant Firm shall provide professional and structured training to the employees to be posted in health institutesf earmarked for e-hospital module in line with the following:

- Training for operationalization of e hospital including Computer skills, Soft skills, database management and data protection
- Ensuring the staffs are adequately deployed and trained in relation to the safe handling of e health Equipment

#### **IIIb Management**



The Consultant Firm shall support the management of e health services in line with the following:

- There shall be a minimum uptime guarantee of 95% of the network.
- Access to Dashboards / Reports to be provided to UKHSDP to monitor daily, weekly, monthly and annual progress on real time basis
- To ensure consent of the patient is taken at every step of procedure
- To ensure the retention of Medical Records of patients which cannot be accessed by anyone else except the authorized personnel.
- Ensuring safe, smooth and uninterrupted operation of e health Equipment.
- Providing round-the-clock response to emergencies/issues arising with respect to the performance of the e health equipment, as per the Specification and Standards and Key Performance Indicators of this Agreement during normal operating conditions.
- Carrying out periodic preventive/ routine maintenance and ensuring that the E-health Equipment remains in good working condition. The selected agency shall ensure regular visits of bio-medical engineers (preventive maintenance).
- Procuring and maintaining adequate inventory of all spares. The selected agency shall procure only the best quality spares, which would be subjected to periodic inspection by the representatives of the UKHSDP at its discretion.
- Carrying out any up-gradation of e health Equipment and replacement of defect in any E-health Equipment, if required, during the agreement period.
- Generation of Electronic Medical Record (EMR) online with video consultation file: The EMR is to be stored till the completion of the project and all the records should be handed over to UKHSDP after the completion of the project. EHR is to be recorded as per the EHR Standard 2016<sup>3</sup> notified by the MoH&FW
- The software developed/customized for the system shall be audited by the agency from a security & controls perspective in consultation with UKHSDP. Such audit shall also include the IT infrastructure and network deployed for system

## **6. Duration of the Assignment**

The expected duration of the assignment is 24 months from date of contract signature. The performance of the consultant will be formally evaluated after 6 months to assess if the Consultant's contract period should be extended or not.

## **7. Deliverables and Timelines**

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<sup>3</sup> [https://www.nrce.in/download/files/pdf/nrce\\_ehr\\_stand\\_india.pdf](https://www.nrce.in/download/files/pdf/nrce_ehr_stand_india.pdf)

The selected consultant will work under overall direction and guidance of UKHSDP office with direct reporting to the Additional Project Director, UKHSDP. For day to day technical and managerial coordination, the selected firm will directly communicate with Joint Director, Health System Strengthening [HSS], UKHFWS, and work closely with his team.

<b>SN</b>	<b>Deliverables</b>	<b>Number and Format of Reports/Deliverables</b>	<b>Broad Contents</b>	<b>Timeline (number of days after previous stage)</b>	<b>Linked to Payment [Yes/No]</b>	<b>% Payment</b>
1	Technical assessment report	1	Technical assessment report with recommendations and action plan for the state so as to meet the requirement including description of general requirements of hardware and software at identified hospitals.	14 days after signing of contract	Yes	5% of the contract value
2	Documentation	1 each	Preparation of documents including Requirement Specification, Detailed Design, Manuals, Modules, Maintenance Manuals, and training strategy for the platform as per acceptable standards.	One month after signing of contract	Yes	5% of the contract value
3	Development of Model	1	<ul style="list-style-type: none"> <li>• Conceptual model developed for on-line/off line e health interactions describing gaps analysis on infrastructure, equipments and other necessary desirable for the hospital intervention.</li> <li>• Presentation of layout and design of system including modules in text format as well as presentation.</li> </ul>	Within 3 month of completion of S.No (2)	Yes	10% of contract Value

			<ul style="list-style-type: none"> <li>Developing e health modules for the state along with UKHSDP inputs.</li> </ul>			
4	Establishment of infrastructure one (pilot) e hospital intervention.	1	<ul style="list-style-type: none"> <li>Preparation and Testing of e hospital module roll out –in atleast one type of each health care facility i.e one Medical college, one DH, one SDH, One CHC, One PHC and one sub-centre (including pilot testing, manpower training etc.)</li> <li>Submit a pilot report for review and suggestion from PIT (UKHSDP)</li> <li>Commencement of e health matrix and e hospital module.</li> <li>Submit a detailed status report regarding completion of establishment of infrastructure including feedback received from PIT.</li> </ul>	6 months of contract signing and acceptance of report	Yes	10% of Contract Value
5	Establishment of infrastructure at other identified hospitals all over the state.	Work Completion report (n=1)	Setting up and establishment of infrastructure to rollout e hospital in all other HCFs all over state identified for e-hospital intervention, based on pilot.	1 year of contract signing	Yes	20% of the contract value
6	Training	As per deliverable 2	Total 80 persons at Medical College Level(n=4) and total 2000 HealthCare worker in 400 secondary care level facilities at training session on management of systems and backstopping plans developed.	Within 3 Month of completion of S.No (4) and (5)	Yes	30% of the contract value

7	Maintenance	continuous	<p>Maintenance of the e-hospital platform and database including but not limited to</p> <ul style="list-style-type: none"> <li>• Video, audio and textual support</li> <li>• Verification of forms (consent forms)</li> <li>• Maintenance of database and periodical changes as required</li> <li>• Clinical and Quality Audits</li> </ul>	For the period till the completion of UKHSD P project	Yes	10% of the contract value
8	Hand Over		<p>Handover of all platforms and database including but not limited to</p> <ul style="list-style-type: none"> <li>• Video, audio and textual support</li> <li>• All filled forms (consent forms)</li> <li>• Database and Audit report to Authorised cell in Director General Health Services Uttarakhand or to any transition committee formed at end of Project or to Uttarakhand Health &amp; Family Welfare Society as instructed by UKHFWS</li> </ul>	At the period till the completion of UKHSD P project	Yes	10% of the contract value

**8. Team Composition and Qualification Requirements for the key Experts (and any other requirement which will be used for evaluating the key experts :**

UKHFWS will assess the demonstrated experience and capacity of interested consulting firms applying for this assignment. The assignment requires a firm with relevant experience in securing E-health for healthcare facilities with experience of doing such assignments for facilities in the public sector.

S. No .	Key Experts and Primary Responsibility	Number	Detailed responsibility	Qualification and Indicative Professional Experience	Indicative estimated person month requirement
<b>K 1</b>	<b>Team Leader/coordinator</b>	1	Single point of contact between UKHFWS and selected firm for successful implementation of this assignment. Represent the Firm in meetings at State Level, and plan, supervise and manage the coordination of entire assignment	Education Level: Master's degree or higher degree in health/IT/Developmental field  Professional Experience: 10 Years  Specific experience: Minimum 5 years experience in e-health  Desired Experience: Minimum 5 years experience in e-health	18 Man months
<b>K 2</b>	<b>Clinic site Experts</b>	4	He/she would define the process and will be involved in technological evaluation and end-point selection from a clinical-usability perspective. The clinical experts will provide instructions/promote implementation of e-health programme among the team	Education Level: Master's degree in modern medicine system.  Professional Experience: 10 Years  Specific experience: Minimum 5 years experience in e-health  Desired Experience: Minimum 5 years experience in e-health	36 man months
<b>K 3</b>	<b>Senior Programmer</b>	1	He/she will provide IT solutions and back end systems support.	Education Level: BE/ B.Tech (computer science)/MCA.  Professional Experience: 10 Years  Specific experience: Minimum 5 year experience in e-health solutions.	24 Man Months

				Desired Experience: Minimum 5 year experience in e-health solutions.	
<b>K 4</b>	<b>Data Base &amp; EHR Expert</b>	1	He/she will manage secure data base and EHR in e-health intervention.	Education Level: BE/ B.Tech (computer science)/MCA.  Professional Experience: 10 Years  Specific experience: Minimum 5 year experience in data secure data base management.  Desired Experience: Minimum 5 year experience in data secure data base management.	24 Man Months
<b>K 5</b>	<b>IT technical coordinator</b>	4	He/she will act as IT solutions provider as well as technical interface at 4 hubs in 4 Government Medical Colleges	Education Level: BCA/MCA.  Professional Experience: 10 Years  Specific experience: Minimum 5 years' experience in IT based Knowledge Process Outsource (KPO). Desired Experience: Minimum 5 years' experience IT based Knowledge Process Outsource (KPO).	36 Man Months
<b>K 6</b>	<b>Technical Support</b>	13	She / He will Process technical investigation (install, maintenance and testing) and support for the e- health program and its related activities.	Education Level: BCA/MCA.  Professional Experience: 3 Years  Specific experience: Minimum 1 years' experience in IT based Knowledge	312 Man Months

				<p>Process Outsource (KPO).</p> <p>Desired Experience: Minimum 5 years' experience IT based Knowledge Process Outsource (KPO).</p>	
<b>K 7</b>	<b>Accounts /Finance Manager</b>	1	She / He will perform all fiduciary and book keeping function related to e-health intervention.	<p>Education Level: CA/MBA Finance.</p> <p>Professional Experience: 5Years</p> <p>Specific experience: Minimum 1 years experience in IT based Knowledge Process Outsource (KPO).</p> <p>Desired Experience: Minimum 3 years experience IT based Knowledge Process Outsource (KPO).</p>	24 Man Months
<b>K 8</b>	<b>Legal &amp; Ethical Expert</b>	1	She /He will provide legal and ethical inputs for safeguards and any legal/ethical issue.	<p>Education Level: LLB/LLM.</p> <p>Professional Experience: 5 Years</p> <p>Specific experience: Minimum 2 years' experience in legal aspects in IT sector.</p> <p>Desired Experience: Minimum 3 years experience in IT sector.</p>	24 Man Months

#### **8.Client's Input and facilities to be made available to the consultant by the client**

The GoUK will provide the detail of facilities and functions to facilitate background knowledge helpful in formulation of documentary material.

#### **9. Composition of review committee to monitor consultant's work**

The Project Implementation Team [PIT] of the UKHFWS has appointed Joint Director, Health System Strengthening [HSS], UKHFWS to monitor and coordinate the activities of the selected firm/consultant. The JD, HSS, UKHFWS shall closely follow up with the selected firm and provide necessary guidance, documents, information, contact details and coordinates, provide support to facilitate meetings, etc., on a timely basis, during the assignment. The JD, HSS, UKHFWS shall also coordinate with relevant stake holders to ensure access to relevant stakeholders and information.

A monthly review of the assignment shall be done under the chairmanship of Project Director/Additional Project Director at Project Office at Dehradun upon submission of monthly progress report which shall have the following members:

- Project Director /Additional Project Director; UKHSDP
- Joint Director; Health System Strengthening UKHSDP
- Assistant Director Procurement; UKHSDP
- Designated IT expert
- Any other official designated by the Project Director

## **10. Copyright**

All materials and documentation during the assignment will be the sole property of UKHFWS.