

## **Terms of Reference**

### **EVALUATION STUDY on USAGE OF THE E- HOSPITAL SOFTWARE DEVELOPED BY NIC, KARNATAKA**

#### **1. Title:**

Evaluation study on Usage of the e-hospital software developed by NIC, Karnataka

#### **2. Department implementing the scheme:**

The scheme is being implemented by the National Health Mission, as a part of e-hospital programme

#### **3. Background and Context:**

The advent of NHM in the state led to adequate strengthening of the public health care system and various system process streamlining has been in progress. Still essential service package, accountability, & transparency in health care to the public are not present. The diseases needs to be classified based on ICD 10 updated version to have uniformity in diagnosis across the globe to meet the global health awareness. This is a key step towards achieving of Universal health Coverage (UHC). At present Community is dependent more on the unorganized, and at times, unqualified private providers leading to heavy out of pocket expenses.

Realising this significant gap during economic survey, state has decided to improve access for public health care; the Government of Karnataka has launched the e-hospital programme to provide accountable & transparent health services to the community. The Hon'ble Chief Minister of Karnataka has announced in his budget speech to implement the project across the state. Even though state government has implemented the project in KC General Hospital, Jayanagar General Hospital and Sanjay Gandhi Institute of Trauma & Orthopaedic Centre as pilot project under NIC guidance through department of DeitY still the complete version is not yet implemented. The software has been provided by NIC, Tripura with storage of data in local servers. Realizing the challenges and constraints over benefit to the community, in financial year 2015-16, with directives of Hon'ble Health Minister, state government is scaling –up the project to other district hospitals & selected General hospital which are under health department with guidance of NIC, Bengaluru under secured connectivity from Karnataka State Wide Area Network (KSWAN) of e-governance department.

Information systems, such as electronic health records (EHRs) and mobile phones and hand held computers (m-health), are now part of urban health movement, they are providing support to health worker to perform clinician duties & keep track of patients. In Karnataka, SMS services



for Maternal Child health related events, tracking to improve accountability at grass root level workers like ASHA & ANM level is being used.

In the proposed e-hospital programme, ICT software allows health care providers to collect, store, retrieve, and transfer information electronically (computerized provider order entry (CPOE), which can minimize handwriting or other communication errors by having physicians or other providers enter orders into a computer system. The following technologies will be practiced in the e-hospital programme in state for strengthening efficient health care in state.

It is visioned that *"A well-functioning health information system is one that ensures the production, analysis, dissemination and use of reliable and timely information on health determinants, health systems performance and health status"*.

**The benefits that are expected out of the project are:**

- Improve patient care by streamlining clinical processes and creating a seamless flow of information.
- Computer-based patient records, portable computers, and expert information systems, to provide clinicians with real-time access to patient information at the point of care.
- Scaled up Telemedicine services to reduce traditional costs and increase the productivity of medical professionals.
- Tele radiology expatriation as a basis for branded healthcare chain, linking rural Hospitals with super speciality hospitals

**Additional benefits that are envisioned are:**

- Exclusive online registration can be implemented along with assured referral services (MCH care) in all the hospitals along with regular registration, billing, discharge summary writing and assistance services including management of beneficiary schemes.
- At state level an consolidated single data generation for monitoring along with incorporation of other existing monitoring tools like HMIS, MCTS, RBSK, Nikshay, IDSP, NCD, e-Aushadhi (DVDMS) and Civil registration system can be initiated

Moreover, a scale up of the services can be done to private medical establishments for referrals services of government schemes like Vajpayee Arogya Scheme, Yeshaswini, PMSSY etc with monitoring of the notifiable diseases through private hospitals

With the incorporation of the above specified salient features, it is expected that the execution of the e-hospital programme be smooth with little or no burden to the technical staffs at hospital level and better implementation, monitoring and management at district & state level

The main objectives of implementing the e-hospital scheme in the hospitals are focussed on:



- To improve the patient centric health services & quality of care in Government health system.
- Improve the efficiency of Health care professionals along with decrease in burden of work load using user friendly software
- To have accurate & valid facility based reports from the hospitals
- To develop appropriate referral services for the needy community

#### 4. Evaluation Scope, Purpose and Objective

An evaluation of the implementation of the scheme needs to be carried out. The e-hospital software got implemented in Medical College Hospitals since the year 2014. It is imperative at this juncture to understand how the software is being implemented and study the various aspects of its utility, success stories, challenges and hence the need undergo the evaluation.

As the e-hospital software got deployed in three hospitals in the year 2014 and now after its 3 years of implementation is all set to roll out the first phase among the 47 district hospitals.

The objectives of the evaluation study are to:

1. Understand the status of adoptability of the e-hospital software developed by NIC
2. Study the implementation experience by the users
3. Assess the impact leading to system process streamlining and improving the efficiency of the hospital as purposed
4. Study the extent of data flow, consolidation and incorporation
5. Bring out the problem and issues involved in implementation of the scheme

#### Scope of work:

The evaluation study would intend to evaluate different the aspects of the scheme in line with the technical, managerial and usage of the scheme. The audit would comprise of functional assessment, utilization of the scheme and managerial audit.

While undergoing the evaluation, following need to be captured:

- a. The agency should bring up and highlight the major issues and concerns pertaining to:
  - Computers and other Hardware
    - Computers, printers
    - Server machine
    - Network
    - Maintenance
    - Back up and inventory
  - Software issues
    - Software package evaluation
    - Software module usage
    - Maintenance and warranty (what is the SLA)
    - Backup support
  - Installation
    - Software installation
    - Hardware installation

- Network verification
- Human resource management
  - Implementation by the existing manpower
  - Appointment of additional manpower
  - Training and Capacity building
  - Adaptability and change management
- Operational aspects
  - Operational efficiency
  - Module adoptability and acceptability (departmental level, service points)
  - CPOE support for users
- User perspective
  - Implementation experience (doctors/ nurses/ other admin staffs)
  - Management of beneficiary schemes (Insurance, TPAs, Government schemes etc)
- Beneficiary perspective
  - Beneficiary experience while availing the service

- b. A detailed analysis of the issues to be undertaken so as to understand the underlying causes for implementation challenges in order to come up with appropriate recommendation to improve the systems.

Tools like Root cause analysis/systems analysis can be adopted.

- c. The agency might undertake a sample on the spot time motion assessment based on the defined specifications and propose a work plan for the same.

(Refer Annexure -I for the expected delivery time of services/facilities at various service points post adoption of the software)

## 5. Evaluation Questions:

While designing the study, the evaluation should address, but not limited to the following areas of enquiry:

1. To what extent the patient centric health services and quality of care was met and what remained unmet?
2. Did the user benefit out of the e-hospital implementation? (A before and after usage comparison of the e-hospital software is to be done. Efficacy and effectiveness is to be analysed)
3. Ease of generating the hospital reports and complying with accurate and valid data?
4. The overall implementation helping to develop and maintain continuity of care; streamlining of referral services? (Case based study could be undertaken and documented.
5. Did the e-hospital software bring about any change in the usage of tele radiology and telemedicine functioning?



6. Is there any change in the turnaround time at various service points after implementing the e-hospital scheme?
7. To what extent the data generated got consolidated with other existing monitoring tools like HMIS, RBSK, Nikshay, IDSP, NCD, e-Ausadhi and Civil registration system and how far it could be aggregated with State level data?
8. The objectives conceptualized pertaining to adopting e-hospital scheme addressing the need holistically?
9. How far the scheme has helped to improve the delivery of the scheme?
10. Lessons from the usage of the e-hospital software from neighbouring states (eg. Tamil Nadu)
11. To what extent the expected outcomes are sustainable?
12. Scalability and further scope of improvement?

## 6. Sampling and Evaluation methodology

A purposive sampling is to be adopted for this study.

The prospective bidder shall propose a detailed work plan and methodology for the evaluation plan.

It would entail understanding of the TOR and determining of SMART indicators and their measurement methodology, identifying data sources, prescribing data collection and analysis methods, fixing sample size for respective components of study, sampling design, survey instruments, fixing threshold values for drawing inferences, putting in place procedures for verifying the findings etc.

A mixed method of qualitative and quantitative approaches is to be adopted while designing the methodology appropriate to bring out the nuances of study areas.

The evaluation would entail hospital evaluation, beneficiary interview and users' interview. Sample size determination is given below as Table 1.

Table1: Sample size determination for the evaluation:

| Particulars           | Sampling Determination  |
|-----------------------|---|
| Hospital evaluation   | The three hospitals where it got piloted namely, KC General Hospital, Jayanagar General Hospital and Sanjay Gandhi Institute of Trauma & Orthopaedic Centre   |
| Beneficiary Interview | 5% of average monthly patient flow (OPD and IPD respectively)<br><br>An exit interview to be conducted. The response should be able to bringout the experience undergone during the various service points while availing the service (eg. appointment scheduling, turnaround time, report despatch etc.) |

|                   |  |
|-------------------|--|
| Users' experience | <p>For users' experience, details to be collected from each of the module implementers. Atleast 25% of the staffs from every department (end users) to be interviewed for the evaluation.</p> <p>Respondents both from clinical and non clinical department should be chosen. Doctors using CPOE to be included in the sampling frame</p> <p><u>Departments to be covered:</u></p> <ol style="list-style-type: none"> <li>1. OPD Patient Registration personnel</li> <li>2. Emergency Registration personnel</li> <li>3. Admission and Discharge</li> <li>4. Billing and Accounts personnel</li> <li>5. Laboratory technician</li> <li>6. Radiology technician</li> <li>7. OT nurse</li> <li>8. OT technician</li> <li>9. Pharmacy personnel</li> <li>10. Blood bank personnel</li> <li>11. Medical Records personnel</li> <li>12. Stores and Inventory personnel</li> <li>13. Laundry personnel</li> <li>14. Dietary personnel</li> <li>15. Telemedicine technician</li> <li>16. Ward nurse</li> <li>17. Doctors using CPOE (suggested a mix of OPD and IPD as applicable)</li> </ol> |
|-------------------|--|

This section would be considered as one of the prime component for crediting for short listing.

## 7. Deliverables and time schedules

The evaluation study should be completed within 5 months. However the proposal would be subject to competitive bidding with the mixed criteria of work plan, judicious time utilization and optimum costing.

The task and deliverables should comply with the proposed work plan and respective micro activities and indicate the major milestones/phases.

Prospective bidders should submit their deliverables as below indicated:

**Deliverable 1: Inception report/evaluation workplan**

**Deliverable 2: An initial draft evaluation report for review**

**Deliverable 3: A final evaluation report**

**Time schedule should be from the date of signing of the work order/MOU**

The evaluation work plan should be prepared by the prospective bidder before going into the full fledged data collection exercise, presented to a joint team of Officers of the sponsoring department



and the KEA Technical Committee and get approved within four weeks from the date of release of first instalment of money. This ensures that the sponsors and the external evaluator stay on same page and ensures compliance with minimal standards. The evaluator would then proceed to collect the data.

The consultant should submit the draft evaluation report within four weeks of completing the field work. It would again be reviewed by the joint team of officers of the sponsoring department and KEA Technical Committee. Within two weeks of receiving comments on draft report, the consultant should submit a final evaluation report incorporating the suggestions on the draft.

The consultant shall submit both soft copy and hard copy of the deliverables. 4 soft copies in CDs and 4 set of hard copies should be submitted for each of the deliverables.

In addition to the deliverable submission, the sponsoring agency may seek translated version of the final report (2 soft copies and 2 hard copies), policy briefs, write up for bulletins/newsletters, power point presentation and other knowledge products for dissemination.

For developing the report, following font details can be used:

Font style : Calibri body; Font size: 11; Line spacing: Multiple at 1.15; Spacing before- 0 point Spacing after -10 point

## **8. Qualities Expected from the Report**

The following are the points, only inclusive and not exhaustive, which need to be mandatorily followed in the preparation of evaluation report:

By the very look of the evaluation report it should be evident that the study is that of Department of Social Welfare of the Government of Karnataka, and Karnataka Evaluation Authority (KEA) which has been done by the Consultant. It should not intend to convey that the study was the initiative and work of the Consultant, merely financed by the Karnataka Evaluation Authority (KEA).

Evaluation is a serious professional task and its presentation should exhibit it accordingly. Please refrain from using glossy, super smooth paper for the entire volume overloaded with photographs, graphics and data in multi-color fancy fonts and styles.

The Terms of Reference (ToR) of the study should form the first Appendix of the report.

The results should correspond to the ToR. In the results chapter, each question of the ToR should be answered. It is only after all questions framed in the ToR that is answered, that results over and above these be detailed.

With regard to recommendations, the number of recommendations is no measure of the quality of evaluation. Evaluation has to be done with a purpose to be practicable to implement the recommendations. The practicable recommendations should not be lost in the population maze of general recommendations.

The report should be complete and logically organized in a clear but simple language. Evaluation report should conform to standard report writing style and structure.

## Ensuring quality

The evaluation report and its findings must demonstrate highest professional standard on par with National and International studies.

## Providing Oversight

Karnataka evaluation authority will provide the funding; all technical aspects of the study will be monitored by **E-hospital - Health and Family Welfare department**

## 9. Administrative arrangements for the study

Conducting the survey would be solely undertaken by the consultant/organization awarded the assignment. However few of the arrangements like the permission/approval letter in the hospitals would be issues by KEA. Also a prior intimation would be given to the respective hospitals and departments to extend timely cooperation to the consultants.

However, the bidder should also specify in the proposal the further support(s) required from the administration and/or the study stakeholders. Necessary arrangements would be made by the sponsoring agency. Ethical clearance/consent should be followed as applicable

The prospective bidder should detail the team structure and team movement plan that would be involved for the study with appropriate justification for contribution in the assignment.

While building the team, the bidder should refer the details as mentioned for the Principal Investigator, and two core team members who would take up the study:

Table 2:

| Sl. No | Subject Experts Requirements | Educational Qualification  | Experience in the relevant field  |
|--------|------------------------------|--|---|
| 1.     | Principal Investigator       | MBBS/BDS/AYUSH with healthcare IT (HIT) background (Preferable)  | At least 5 years of experience in HIT implementation                                      |
| 2.     | Member 1                     | MHA/MBA in hospital BE - IT/ Electronics/ B.Tech - IT/ BE - IT/ Electronics/ B.Tech - IT (with knowledge of system process managing and strengthening (preferable) | At least 3 years of work experience in hospital system process managing and strengthening |
| 3.     | Member 2                     | MCA /M.Sc Statistics   | 3 years in data management  |

## 10. Cost and Schedule of Budget release:

Output based budget release will be as follows-

1. The **first instalment** of Consultation fee amounting to 30% of the total fee shall be payable as advance to the Consultant after the approval of the inception report,



but only on execution of a bank guarantee of a scheduled nationalized bank, valid for a period of at least 12 months from the date of issuance of advance.

2. The **second instalment** of Consultation fee amounting to 50% of the total fee shall be payable to the Consultant after the approval of the Draft report.
3. The **third and final instalment** of Consultation fee amounting to 20% of the total fee shall be payable to the Consultant after the receipt of the hard and soft copies of the final report in such format and number as prescribed in the agreement, along with all original documents containing primary and secondary data, processed data outputs, study report and soft copies of all literature used in the final report.

Taxes will be deducted from each payment, as per rates in force. In addition, the evaluating agency/consultant is expected to pay service tax at their end.

#### **11. Selection of Consultant Agency for Evaluation:**

The selection of evaluation agency should be finalized as per provisions of KTPP Act and rules without compromising on the quality.

#### **12. Contact person to get further details about the study**

At Health department approach to Mission Director National Health Mission Karnataka and subsequently after Office Order the evaluation team should coordinate with Deputy Director, e-hospital programme (mail Id: eh.karhfw@gmail.com) Government of Karnataka; phone: 9449843439.





# ANNEXURE - I

The desired delivery time duration at various service points, post adoption of the e-hospital scheme:

| Sl. No | Services/Facilities                                      | Using e-hospital @NIC  |
|--------|--|--|
| 1.     | Patient Registration                                     | 35 seconds per New patient   |
| 2.     | Follow-Up Re-Registration with UHID)                     | 15 seconds per patient   |
| 3.     | Billing & Cash Collection                                | 30 seconds   |
| 4.     | Laboratory Investigation report for OPD patient          | Same day in most cases   |
| 5.     | Radiology Investigation Report for OPD Patient           | Same day in most cases   |
| 6.     | Emergency Services such as Ambulance, Blood Bank, OT etc | Managed and available at all care points   |
| 7.     | Dietary Service  | Managed diet distribution among patient as per diet scale & linked with inventory system of raw materials  |
| 8.     | Inventory Service  | Reduced waste - no stockpiling or expired products   |
| 9.     | Blood Bank   | Increase in blood utilization, specially on the high cost products - wastage avoided<br>*Donor's information shared and disseminated helping Donor deferral process and avoiding repeat of expensive tests.<br>*Centralize Blood inventory information -saves time, cost and makes blood banking productive. |
| 10.    | Care Planning by Physicians                              | EMR of a patient helps physician in better care planning and monitoring  |

*[Signature]*  
11/10/17  
Chief Evaluation Officer  
Karnataka Evaluation Authority

*[Signature]*  
C. Chaya Degamkar  
(Con. (EVI))

