SECTION I: INSTRUCTIONS TO BIDDERS

1. Project Title

Integrated National Health Information System (HIS) for the Ministry of Health (MOH) of the Seychelles Government

2. Background

At present the Seychelles health care system relies primarily on manual paper-based administrative methods for record-keeping, clinical management and for supporting decision making in health care delivery.

Currently the main hospital (Seychelles Hospital), is equipped with a state of the Art Diagnostic centre which comprises of all Siemens equipment and associated software information system packages. The vast majority of medical equipment related solutions in the hospital are of the Siemens make, including the Siemens Radiology information system and the Siemens PACS.

In addition to the Siemens PACS system and Siemens Radiology Information system, there is also an LIMS (Laboratory Information Management System) which no longer has support available for it from its original solutions provider.

The country does have a National Population Database (NPD) system, which provides each citizen with a National ID card and a unique identifier; the National Identification Number (NIN).

By establishing an integrated HIS (Health Information System), the Ministry of Health (MOH) is making the necessary commitment that is expected to lead to improvements in health care quality, efficiency of delivery and access, while also moving the health care system closer to harmonization with relevant international standards.

The HIS will be utilized throughout the whole Government healthcare service. This consists of the 16 health Centres spread over 3 islands and 1 main hospital (300 beds) with 6 annexes. The annexes are geographically separate from the main body of the hospital and are specialist centres. It is to be noted that the population of the Seychelles is within 100,000 people. The following are some statistical information relating to the healthcare system:

Statistical Information	**Number**
Average number of Out-Patients registered per year	500,000
Average number of In-Patients registered per year	14,000
Average number of patients attending Casualty per year	30,000
Existing Bed Complements	352
Average number of operations done per year	4366
Average number investigations undertaken per year	660,000
Number of Personnel	1648
Number of Doctors (inclusive of specialists)	185
Number of Nurses	434

Section V of the document provides more details of the services offered by the health system in Seychelles.

3. Objectives

The primary objective is to improve the efficiency and quality of health care delivery in the Republic of Seychelles by better management of clinical and other related healthcare information by leveraging the potential of ICT in this area. This is primarily through the implementation of a standardized and sustainable Health Information System (HIS) that will cover services at primary/secondary/tertiary level of the health care system. Central to this is the implementation of an integrated EMR (Electronic Medical Record) solution that will cover 100% of the citizen population of Seychelles.

The secondary purpose of the project is to link the Health Information System to the various national E-Government systems (e.g. birth and death registry) to improve health related regulatory enforcement and overall Government strategic decision-making nationally for planning purposes.

4. Scope of Work

The project consists of the following:

(1) Supply of the Health Information System (HIS) software product / license;
(2) Provide the server hardware (& related hardware) requirements (server sizing) for running the HIS solution in a fully protected manner (i.e. if hardware of application level failure at one site, service is maintained by the other);
(3) Onsite customization, installation and implementation of the software that will constitute the integrated Health Information System (HIS);
(4) Onsite training of MOH staff in the use the HIS aligned to the operational business processes of the different user groups;
(5) Interfacing of specific modules of the HIS to existing information systems or equipment;
(6) Training of in-house onsite IT personnel to provide 1st and 2nd level support for the HIS;
(7) Provision of a 1 year Enterprise Level Support contract for HIS solution AFTER commissioning of the system.

The Health Information System should allow for connecting, interacting and engaging with patients anywhere and anytime while empowering a care team of clinicians, nurses and managers to make better decisions about patient care, operations and patient management

The integrated Health Information System (HIS) is expected to comprise of the set of modules indicated in the Technical Specifications (Section IV of the document) or deliver functionalities described by these modules. Section IV also indicates the modules that need to be interfaced with the existing systems.

The HIS system also needs to be able to support digital signatures. There are medical forms / documents in the exiting manual system that may require a signature by law. As such, the HIS needs to support the digital signing for possible equivalents.

The HIS solution and its modules have to be compliant with the following standards:
a. ICD9/10 (International Code of Diseases, Clinical Modification).
b. CPT4 (Current Procedure Terminology).
c. HCPCS (HealthCare Procedures Code Set).
d. DICOM 3.0 (Digital Imaging and Communication in Medicine) protocol for direct interfacing with medical imaging modalities.
e. HL7 (Health Level 7) protocol for the exchange of medical information among different medical systems.

f. HIPAA Compliant (EDI, Code Sets, Privacy).
g. LOINC (Logical Observation Identifiers Names and Codes).
h. SNOMED CT (Systematized Nomenclature of Medicine -- Clinical Terms)

The HIS solution is to be centrally based and served from the main hospital server room and from the main Government Datacenter at a different geographical location. All the institutions under the MOH are networked together which will allow access to the HIS application. In addition to access via fixed terminals (i.e. laptops / desktops) connected to LANs by cable, it is also expected that specialized medical tablet devices utilizing WLAN will also be utilized for accessing the HIS. HIS should be accessible by clinicians by the bedsides of their patients on mobile devices. The HIS should be able to be accessed by mobile devices running a range of mobile operating systems. The HIS supplier is required to provide the recommended bandwidth for accessing HIS is an optimal manner for WAN connectivity (i.e. locations that are outside the LAN on which the HIS server/s are located on).

Given the Government of Seychelles has standardized on Microsoft technologies for its E-Government platform and solutions; it is required that the HIS solution runs on Microsoft Server Operating systems and utilizes MS SQL server for its database infrastructure. Government of Seychelles also has a full Enterprise Agreement with Microsoft for the licenses of its products. As such, costs related to Microsoft related licenses are NOT to be included in the HIS bid proposal. Only the list and quantities of Microsoft product licenses are required to be specified. Government of Seychelles will provide these.

5. Prequalification Criteria Information Document

A document is to be prepared by the bidder which is to comprise of all the information requested in Section II of this document.

6. HIS Technical Proposal Document

The bidder is to prepare its proposal for the HIS as a document. The HIS Technical proposal document should address the Technical Specifications & Requirements outlined in Section IV of this document. It is also to take into account any other instructions or relevant information in Section I (Scope of Work).

As part of the HIS Proposal Document, the vendor / solutions provider is required to specify the following in detail:

-Implementation Methodology to be followed
-Quality Assurance Plan
-Project Team Structure
-Review and reporting mechanism
-Representative profiles of Key personnel
-Project Implementation Timelines
-Key Deliverables and Milestones

7. Financial / Commercial Proposal

The bidder is to use the format given below to provide details of its Commercial Bid.

Item Description	**Year 0**	**Year 1**
System Software-License Fees		

(Non-Microsoft products)		
Proposed HIS Software-License Fees		
Customisation & Interfacing with existing systems		
Implementation Costs		
Training Costs		
Cost of Annual Maintenance Contract (AMC)		
Duties & Taxes		
Any Other Costs		
Grand Total		

Year 0 is the year of the implementation and Year 1 will be is the first year of operation after commissioning of the HIS. The total cost of the proposal will be taken as (Year0 Grand Total) + (Year1 Grand Total).

8. Tender Evaluation & Selection

Tender evaluation will be conducted by a committee of four persons.

The evaluation of the Bid will be based on a the satisfaction of the Prequalification Criteria (Stage 1), Technical Evaluation (Stage 2), Bidder Presentations & Client References (Stage 3) and Financial (Commercial) / Price Evaluation (Stage 4). In relation to Stage 3 a fully guided site visit may be requested at a location where the HIS has been implemented. The Prequalification Criteria are described in Section II of the document.

a) Once the bidder qualifies on the basis of prequalification questionnaire (Stage 1), the Technical Evaluation Score (Stage 2) shall be computed on the following grounds:

Vendor	**Strength**	**Max. Score**
	Part A - For HIS software	
1.	Quality Certification/s of System	5
2.	Product Architecture and Technical • Performance (3 sec) for single transaction except for PACS. • Scalable. • Reliable. • Available. • Secure.	10

3.	Implemented customer sites of the Proposed HIS	*5*
4.	HIS Functionality Requirements	*55*
	Total	**75**
Part B - For Bidder		
5.	Past Experience	*5*
6.	Manpower Strength of the Vendor (including Project Management certified Project Manager)	15
7.	Quality Certification/s of Vendor	*5*
	Total	**25**

b) The qualifying criteria for Stage 2 shall be:

i. Part A Score must be >= 52.5
ii. Part B Score must be >= 17.5
iii. Total Score (Part A + Part B) must be >= 70

c) Stage-3 evaluation would be limited to an exercise of verification of information provided the Bidder by means of presentation, use of demonstration / lab version of system & client references, which may include site visits. However, Stage 3 evaluation may lead to rejection including forfeiture of any bid found to be inconsistent with claims made by the Bidder in Stage 1 & Stage 2 evaluation.

d) After completion of Stage 3 evaluation, the Commercial / Price Bids of those Bidders who meet the criteria mentioned in (b) & (c) above shall be opened. The Price Evaluation Score (Stage 4) of these Bids shall be computed on the following grounds:

If commercial bids for Bidder 1, 2, 3, 4……..are taken as L1, L2, L3, L4……..wherein L1 is the lowest bid;

The weightage given to commercial bids would be L1/L1, L1/L2, L1/L3, L1/L4……for Bidder 1, 2, 3, 4……..respectively.

Similarly weightage will be calculated for technical evaluation:

If scores of technical evaluation for Bidder 1, 2, 3, 4……..are taken as T1, T2, T3, T4……wherein T4 is the highest score;

The weightage given to technical evaluation would be T1/T4, T2/T4, T3/T4, T4/T4……. For Bidder 1, 2, 3, 4……..respectively.

Each proposal would be evaluated against the 70-30 criteria. This means 70% weightage will be given to Technical proposal and 30% to financial proposal.

As a last step, the technical and financial scores obtained by all the organizations screened at Stage 4 would be summed and the organization that scores the highest would be AWARDED THE BID.

The final scores for the bidder 1, 2, 3, 4……. Would be a follows:

(Technical Weightage)*0.7 + (Commercial Weightage)*0.3

Bidder 1:
(T1/T4)*0.7 + (L1/L1)*0.3

Bidder 2:
(T2/T4)*0.7 + (L1/L2)*0.3

Bidder 3:
(T3/T4)*0.7 + (L1/L3)*0.3

Bidder 4:
(T4/T4)*0.7 + (L1/L4)*0.3

9. Implementation Supervisory Committee

A supervisory committee shall be constituted which will review the progress and provide necessary advice for mid-course corrections to the successful vendor. The committee will comprise of representatives of the Ministry of Health (MOH), Department of ICT (DICT) and the vendor.

10. Project Execution Approach & Methodology

The successful vendor / solutions provider should propose a comprehensive strategy for project execution, which should clearly bring out the integration of HIS elements like PACS and RIS. The vendor / solutions provider should take up the following sequence of activities during the course of project execution:

10.1 Product Customization:

- System Study and Gap Analysis

Study the workflow and functional requirements at MOH. Estimate the exact customization effort & costs depending upon the requirements. Present the Gap Analysis report and detailed findings as part of Gap Analysis Document (GAD). Obtain sign off for GAD and agreement on the customization effort.
Prepare a detailed project plan for executing the project
Finalize the project reporting and project monitoring procedures
Finalize the training schedule and training participants along with the MOH/DICT team.

Customization

1. Prepare the Design Document (in case of enhancements)
2. Customization of HIS modules
3. Prepare Unit Test plans (UTPs) and System Test Plans (STPs)

- System Testing

1. Execute System Tests
2. Review of System Tests results
3. Prepare User Manual

- Acceptance Testing

1. Install the application software in the User Acceptance Test (UAT) environment
2. Execute acceptance tests using the Acceptance Test data provided by the MOH/DICT
3. Document discrepancies and defects encountered in the course of acceptance testing
4. Jointly review with authorized DICT/MOH personnel the discrepancies and defects with a view to diagnosing the nature of the problems

5. Attend to and fix the deficiencies/defects arising from the software not performing in accordance with the GAD.
6. Once the discrepancies are resolved, repeat the necessary Acceptance Tests
7. Formal acceptance of the system by MOH/DICT

- Implementation

1. Deployment of the HIS in the Production environment
2. Resolution of problems/bugs reported during support period

10.2 Documentation

It is the responsibility of vendor / solutions provider to provide at least the following documents to MOH/DICT:

- Gap Analysis Document (GAD) or System Requirement Specification (SRS)
- Software Design Documentation (SDD)
- User Manuals
- Training Manuals
- Implementation Manuals

11. Source of Funding

Government of Seychelles / Government of India EXIM bank loan

12. Eligibility

The bidder should be an entity registered in India.

13. Documents to be submitted

The bidder must submit:

- The completed Form of Bid
- Prequalification Criteria Information Documents (as specified in Section II)
- Financial / Commercial Proposal
- HIS Technical Proposal Document

Failure of submission of any of the above stated documents will lead to the bid being declared not valid.

6. Cost of Bidding

The bidder shall bear all costs associated with the preparation and submission of its bid, Government of Seychelles, the Ministry of Health (MOH) or the Department of ICT (DICT) shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

7. Language of Bid

The bid, as well as all correspondence and documents relating to the bid, exchanged by the bidder and the Government of Seychelles, shall be written in the English language.

8. Clarification of Biding Documents

Pre Tender Clarification in respect of the contents of the Bid Documents or closely connected and relevant information therein shall be sought in writing from the client and or his representatives Principal Secretary, attention Procurement Manager, DICT, Caravelle House, Victoria, Mahe, Seychelles, Tel +248 4286642 or +248 4286609, email: tender@ict.gov.sc.

A prospective Bidder may request DICT in writing for clarifications of the bidding documents. DICT shall respond to the queries 5 days prior to the deadline for submission of bids. DICT shall also send copies of his response to all the bidders who have obtained the bidding documents, without identifying the originator of the request. Similarly, prior to the deadline for submission of bids DICT may modify the bidding documents by issuing addenda.

The Tenderer must satisfy himself as to the general accuracy of the quantities given in the Schedule of Works and must provide accordingly in the tendered rates

9. Currency of Bids

The currency to be used is the United State Dollar (USD).

10. Period of Validity

Bids shall remain valid for the period of 90 days after the bid submission deadline subscribe by DICT.

In exceptional circumstances, prior to expiry of the bid validity period, the Procuring Entity may request Bidders to extend the period of validity of their bids. The request and the responses shall be made in writing.

In the case of fixed price contracts, if the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial bid validity, the Contract price shall be adjusted by a factor specified in the request for extension. Bid evaluation shall be based on the Bid Price without taking into consideration the above correction.

11. Submission of Documents

Bidders must place the documents to be submitted in a sealed envelope with

"INTEGRATED NATIONAL HEALTH INFORMATION SYSTEM PROJECT"

clearly typed on it. The envelope should contain the following:
(a) The fully completed 'Form of Bid';
(b) A covering letter along with all related documents as per Section II;
(c) A sealed envelope labelled "Technical Proposal" which contain all related documentation;
(d) A sealed envelope labelled "Financial Proposal" which contains all related documentation..

In addition to the hard copies of documents, their electronic versions will be required to be placed on an external media (e.g. pen-drive or CD/DVD) and placed in the envelope.

Tenders should be sent by registered post or delivered by hand to the National Tender board before **14.00 hrs** on **Thursday 10th August 2017**

Late Bids: "Any bid received by DICT after the deadline for submission of bids shall be declared late, rejected and returned unopened to the Bidder.

12. Bid Opening

Tenders opening will be conducted at National Tender Board on **Thursday 10th August 2017** at **14:00 hrs**. The bidders' names and the content of the completed 'Form of Bid' will be announced at the bid opening. The weightings of the technical and financial evaluations will also be stated (Financial Proposal – 30% & Technical Proposal – 70%).

Bids or modifications that are not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances. In particular, any discount offered by a Bidder which is not read out at bid opening shall not be considered further.

13. Confidentiality

Information relating to the examination, evaluation, comparison and post qualification of bids and recommendation of contract award shall not be disclosed to bidders or any other persons not officially concerned with such process until information on contract award is communicated to all bidders.

Any effort by a bidder to influence the DICT or MOH in the examination, evaluation, comparison and post qualification of the bids or Contract award decisions may result in the rejection of its bid.

14. Comparisons of Bids

DICT and MOH shall compare all substantially responsive bids to determine which provide the best value for money proposal.

The Comparisons shall be based upon an examination of the documentary evidence submitted by the bidder.

The comparisons shall also be based on a documented technical report of the technical aspects of bids submitted performed by technical personnel of DICT to confirm the completeness as per requirements provided.

15. Correction of Errors

Bids determined to be substantially responsive will be checked by DICT and MOH for any arithmetic errors. Errors will be corrected by the DICT and MOH as follows:

(a) Where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and

(b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.

16. Examination of Bids and Determination of Responsiveness

Prior to the detailed evaluation of bids, the DICT will determine whether each Bid is substantially responsive to the requirement of the bidding documents. A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one:

(a) which affects in any substantial way the scope, quality, or performance of the works;

(b) which limits in any substantial way, inconsistent with the bidding documents, the DICT rights or the Bidder's obligations under the Contract;
(c) whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

If a Bid is not substantially responsive, it will be rejected by the DICT, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

An affirmative determination shall be pre-requisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid, in which event DICT shall proceed to the next lowest evaluated bid to make a similar determination of that Bidder's qualifications to perform satisfactorily.

17. Proposals

The bidder/vendor must cater for all the specified requirements related to clauses 4, 5, 6 and 7 of the bidders instruction document.

Literature regarding the technical details of solutions to be supplied for the provision of the solution should be sent in sealed envelopes, indicating clearly the contents of each envelope. The financial / commercial proposal is to be separate to the technical proposal.

The purchaser reserves the right to amend the solution requirement parameters quoted by a reasonable extent and amending the total contract sum accordingly by applying the unit rates quoted before awarding the contract.

18. Terms of Payments

The following payment terms is proposed:

30% on signature of contract
35% on completion of the installation and customisation of the software
35% on Completion certificate and Final acceptance of the work

19. Delivery Period

The HIS solution is to be put into service and tested within a maximum period of 12 months.

20. Warranty

Not Applicable.

21. Ambiguities and Uncertainties

Any ambiguities and uncertainties from the tender document should be queried to the **Principal Secretary, Department of Information Communication Technology, 3rd Floor, Caravelle House, and P.O Box 737, Victoria. Tel: + (248) 4286609/+ (248) 4722413 Fax: + (248) 4324643 Email: psoffice@ict.gov.sc.** The replies to such queries and additional clarifying information shall be communicated to all participants of the tender.

22. Procuring Entity's Right to accept any bid and to reject any or all bids

DICT and MOH reserves the right not to accept or reject any bid and to annul the bidding process and reject all bids any time prior to contract award without thereby incurring any liability to bidders.

23. Award of Contract

MOH shall award the Contract to the Bidders whose offer has been determine to be the best value for money evaluated bid and is substantially responsive to the bidding Documents, provided further that the bidder is determined to provide the service satisfactorily.

MOH shall notify the successful bidder, in writing that its bid has been accepted. At the same time the MOH shall also notify all other bidders of the results of the bidding.

24. Corrupt or Fraudulent Practices

DICT and MOH requires that Bidders/Suppliers/Contractors observed the highest standards of ethics during the procurement and execution of such contracts. In pursuance of this policy, the following terms are defined as follows:

(i) "corrupt practice" means the offering, giving, receiving ore soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and

(ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Employer, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprived the Employer of the benefits of free and open competition;

SECTION II: SCHEDULE OF REQUIREMENTS – PREQUALIFICATION CRITERIA

The bidder must provide the following as part of the Prequalification Criteria of their proposals:

1.1. The bidder should be an entity registered in India.

1.2. The bidder should have implemented a Hospital Management Information System including PACS at a hospital that has 300 or more beds and it should be running satisfactorily for more than 3 years as on date of the submission of bid. A letter of satisfactory performance from the Chief Executive Officer or Administrative Director of the hospital in which it is running should be enclosed along with the bid.

1.3. The software should be ICD – 10, HL – 7, DICOM, ASTM, CPT compliant and the bidder should be able to demonstrate the compliance as described in 5.1.1, at a location upon request.

1.4. The bidder should be able to demonstrate the application software for the Hospital Management System at a location where they have implemented these systems covering most of the functionalities upon request.

1.5. The software offered should be able to work on a Microsoft server platform. It should be interoperable, modular in design, thin client compatible and be able to integrate seamlessly with Laboratory Information System, Radiology Information System including PACS and Telemedicine.

1.6. The software should feature integrated data analysis capabilities that can be used for Decision Support System.

1.7. The bidder should specify the qualifications and experience of the domain specialists and experts in the implementation team, the software design and R & D team at the software development center.

1.8. The bidder should be in a position to station adequate manpower to complete the entire implementation in a time period of less than 12 months from the placement of the order.

1.9. Implementing a HIS is more of a Change Management challenge than installing and implementing a technology based product. Hence the project manager who will be working on the project should be Project Management certified. Please enclose CV's of proposed Project Manager/s along with bid. The bidder should also give details of the application software and change management specialists for the respective areas of installation and implementation of the system.

1.10 The bidder should have implemented a HIS server farm with redundant and failover servers in 300 or more bedded hospital described above and it should be running satisfactorily for more than 3 years as on date of the submission of bid.

SECTION III: FORM OF BID
For

PROVISION OF INTEGRATED HEALTH INFORMATION SYSTEM FOR THE SEYCHELLES MOH

Department of Information Communication Technology
3rd Floor, Caravelle House
P.O Box 737
Victoria
Seychelles

I / We undersigned having examined the instructions, specifications, conditions of contract and other bidding documents for the 'INTEGRATED HEALTH INFORMATION SYSTEM PROJECT' offer to contract for the said contract in conformity with the aforesaid documents for the sum of:

UNITED STATES DOLLARS (USD):

.....

TOTAL IN WORDS:
.....

.....

Or such sum as may be ascertained in accordance with the said conditions.

I/ We undertake the complete all obligations under the contract within twelve (12) months from the date of award of the contract.

I/We agree that my/ our Tender shall remain open for acceptance for a period of three (3) months from the date of submission of tenders.

I/ We understand that you are not bound to accept the lowest or any Tender and should I/we fail to comply with the instructions to Tenders my/ our tender may not be considered.

This tender has been prepared entirely at my/ our own expenses.

Yours faithfully

NAME OF SERVICE PROVIDER: .....

SERVICE PROVIDER'S SIGNATURE: .....

ADDRESS:

.....

.....

This tender must be delivered, in strict accordance with the 'Instruction to Bidders' to the NATIONAL TENDER BOARD not later than 10th August 2017 at 14:00 hrs.

SECTION IV: TECHNICAL & FUNCTIONAL SPECIFICATIONS

1/ Introduction

The proposed HIS system should be a comprehensive system that integrates all the departments in an international level hospital, automates most of its major functions and also extends these throughout the whole healthcare system of the country. The system is to be me made available at the main hospital in the Seychelles Hospital, its geographically distributed Annexes, health centers and clinics located on 3 islands. The following key benefits are targeted from the proposed HIS:

- Online availability of information
- Improved administration & control
- Automated information flow across departments avoiding duplication
- Simplified billing & discharge process
- Optimized resource allocation

In order to have the targeted benefits, the HIS is to have the following features:

- Multiple level Security
- Graphical User Interface
- Online Help & User Manual
- Web enabled
- ICD 10 / CPT codes incorporation
- HL7 compliance
- Mobile Device Interface (SMS/WAP/Smartphone)
- Smart Card Interface
- Barcode Compatibility
- Drug Database integration

The Health Information System (HIS) will be situated on a 1Gbps LAN and it is projected that there will be 300 nodes connected to it. There will also be WLANs throughout the main hospital. The main LAN will be connected via a WAN (principally dedicated lease circuits; lease lines) to its annexes and health centers / clinics. The main server room in Seychelles Hospital will also be linked by an optic fiber link to the main Government Datacenter location. The HIS server setup at the datacenter location will be a replica of the one at the Seychelles Hospital.

The integrated HIS will be used throughout the whole of the healthcare system (primary / secondary / tertiary levels) and physical locations (main hospitals, annexes & health centers / clinics). As such, it is important to note that the proposed HIS must have the facility for differentiating the different locations and adding new departments / locations as more departments may be added to those already existing over time.

2/ Functionality Requirements:

All the features and functions desired for the optimal operation of a care multi-specialty hospital is to be provided in an integrated platform, which includes but not limited to, Laboratory and Radiology Management System, PACS and Telemedicine.

A detail study of existing systems and required functionalities for the HIS system is to be conducted to be able to understand the customizations that will possibly be required. Results of these are to be documented by the vendor.

The vendor should submit information in response to desired features listed below:

2.1 Patient Management System (PMS)

The Patient Management System shall broadly cover

2.1.1 Out-patient Registrations, including:

- Capturing basic patient demographic information;
- Generation of out-patient ID (NIN from the NPD system is to be used as primary identifier);
- Consulting details;
- Clinical follow up;
- Lab test reports;
- Diagnosis;
- Insurance details;
- Patient bill status;
- Referral data; etc.
- Sick leave Issuance (absence from work)

* Specialty & Subspecialty template development may be required

2.1.2 In-patient Admission-Transfer-Discharge (ATD) Process, including:

- Capturing basic patient demographic information;
- Basic health record;
- Past medical history;
- Current medication;
- Details of ailment including allergy, disability, chronic diseases, addiction, etc.;
- In-patient ID (NIN from the NPD system is to be used as primary identifier);
- Insurance details;
- Referral data;
- Patient admission from various sources (OPD, accidents & emergency units, referrals, transfers from other hospitals / clinics, etc.);
- Reservation of beds;
- In-patient care;
- Generation of Transfer Requests (if required);
- Operation details (if any);
- Medical images (if any);
- Lab test reports;
- Patient bill status;

- Discharge details;
- Printing of Admission & Discharge slips / cards; etc.

2.1.3 Consulting Appointment Management, including:

- Set-up of Hospital Calendar capturing non-working days, day-care timings, etc;
- Scheduling multiple services
- Availability & Time-slot of Consulting Doctors as per day & time combinations;
- Search for Consulting Doctors as per service;
- Appointment Booking of Consulting Doctors on internet, smart phones, IVR, walk-in, etc.
- Booking of multiple slots for patients;
- Booking of multiple appointments per slot;
- Appointment cancellation / re-scheduling;
- Reminders via e-mail & SMS.

2.1.4 Casualty & Emergency Registrations & Management, including:

- Capturing of whatever basic patient demographic information available at the time of registration of the casualty & updating of the same when fully available;
- Temporary ATD;
- Consulting details;
- Clinical follow up;
- Lab test reports;
- Diagnosis;
- Services bookings;
- Pharmacy / Surgical details;
- Statutory forms & reports; etc.

2.1.5 Clinical Care System (CCS):

The Clinical Care System shall broadly cover:

2.1.5.1 Clinical follow up, including:

- Recording patient visit details like patient complaints, physician findings;
- Medical prescriptions, diagnostic tests, follow-up information, etc.;
- Easy access to patient basic health records;
- Viewing of patient medication history & laboratory test results;
- Appointment for tests;
- Recording sample collection details;
- Authorization of laboratory test results (if applicable);
- Interface to medical equipment, billing & inventory; etc.

2.1.5.2 Service Order Processing, including:

- Generation of Service Orders by Service Points like Clinics, Wards, OT, etc.;
- Electronic processing;
- Service Order Tracking, including Service Point account for material consumption against Service Order, detection of material wastage, detection of loss of revenue at service point, etc.;
- Billing patients as per the services rendered, etc.

2.1.5.3 Operation Theatres Management, including:

- Maintenance of OT & staff calendar;
- OT Scheduling including scheduling of providers & resources;
- Material requisition;
- Recording operation details like list of staff present, date of operation, start & end time of operation, details of procedure notes & nurse instructions, pre & post operation care procedures, etc.
- Interface to inventory & billing;

2.1.5.4 Nursing & Ward Management:

- Ability to access Patient Administration system for user defined data items.
- Ability to link in with the order communications.
- Ability to include notification of patient's pending arrival including any admission tests to be performed, the treatment proposed and the condition of the patient, including the initial diagnosis. For surgery, the theatre schedule must be notified, together with any preparation required.
- Ability to record admissions, discharge and transfers at the wards to update the bed census, confirm location of the patient and to notify ancillary departments such as dietary.

2.1.3.5 Quality Improvement (Nursing Services):

- Statistic of total hours that the nurse has spent with the patient, with procedures been made containing the nursing and medical diagnosis of the patient.
- Provide diagnostic control on reducing operational errors and minimize incident (needle stick injury, drug error etc.)
- Infection Control (Nursing Services)
- Ability to record extra clinical details against a patient record for infection control purpose like (HEP: A, B, C, HIV and other infectious diseases.
- Ability to access user defined patient data from Patient Administration data items.
- Ability to receive automatic notification of certain specific hospital defined organisms growing from culture.
- Facilities to access patient clinical data (CBC, CRP etc) date of operation, TPN curve. etc.
- Ability to access date of admission and discharge of selective Patients.
- Ability to gather statistics according to international standards for infection control.

2.1.3.6 Bed Management (Nursing Services):

- Ability to provide on line access to Accommodation usage by room
- Ability to print bed utilization per ward, consultant and specialty
    - Daily
    - Monthly
- Ability to report bed days by
    - Ward
    - Consultant
    - Specialty
    - Diagnosis/classification
- Ability to analyze ward or room occupants by sex, service, age etc.

2.1.3.7 Blood Bank, including:

- Blood collection, storage & supply from voluntary donors;
- Maintenance of Blood Stock Register;
- Maintenance of Donor Database;
- Confirm availability for anticipated use (for operation, accident patients, etc.);
- Capturing detailed information about blood samples;
- Replacement of blood against borrowings;
- Processing of service requests;
- Maintenance of inventory / interface to existing inventory system, billing, etc.
- Condemnation of blood, etc.

2.1.3.8 Electronic Medical Records (EMR), including:

- Collated & formatted information on patients, as required;
- Search on patient records by patient name, patient ID, etc;
- Complete clinical data repository, capturing basic patient demographic details, medical history, consultations, diagnosis, laboratory reports, medical images, medical treatment records, etc.
- Logistical data related to the patient interacting with the health service (e.g. Sick leave issued, referals etc.)
- Built-in reports and user-oriented report-writing capabilities, etc.

2.1.3.8 CSSD, including:

- OT Equipment Set Register;
- Sterilization Acceptance;
- Generation of Equipment list as per OT Schedule;
- Lead time adjustment for the Equipment;

2.1.3.9 Telemedicine:

- Ability to provide unique Patient number (NIN)
- Ability to make appointments over telemedicine network from clients (remote patient location)
- Ability to have voice and video connectivity
- Ability to attach the medical data transmitted to be part of the patient EMR
- Ability for the remote doctor (client) to access patients EMR
- Ability to transfer the EMR data of the patient upon the request from the telemedicine client

3/ Standards:

The proposed HIS is to be compliant with, but shall not be limited to, the following international healthcare standards:

a) American Society for Testing & Materials (ASTM)
- For interfaces to laboratory equipment complying with ASTM

b) Digital Imaging & Communication in Medicine (DICOM 3.0)
- For images

c) Health Level 7 (HL7)
- For messaging & communicating with HL7 compliant systems

d) International Statistical Classification of Diseases & Related Health Problems, 10th Revision (ICD9/10)
- Controls for ICD coding of discharge diagnosis details

e) Current Procedural Terminology (CPT4)
- Support for coding of services

f) Clinical Physician Order Entry (CPOE)
-Support for ease in data entry for physician, which helps in user adoption as well as ergonomics of the solution.

g) HCPCS (HealthCare Procedures Code Set

h) HIPAA Compliant (EDI, Code Sets, Privacy).

i) LOINC (Logical Observation Identifiers Names and Codes).

j) SNOMED CT (Systematized Nomenclature of Medicine -- Clinical Terms)
.
NOTE: The proposed HIS solution must confirm to the above-mentioned standards currently, and the vendor is expected to demonstrate these standards in existing reference customer.

4/ Application Architecture:

The implementation of the HIS is aimed at bringing benefits for the patient, Clinicians and for administrators/managers. The targeted benefits:

4.1.1 Patient

- Computerized medical record
- Preventive healthcare
- Appointment booking on web, phone and mobile

4.1.2 Clinicians

- Online access to patient health records
- Computerized prescription
- Online referrals
- Paperless virtual office

4.1.3 Administrator

- Optimum resource utilization
- Computerized scheduling of staff and services
- Online reports

4.2 The application architecture should be such that it has capability of delivering the following:

4.2.1 Scalability

- New servers can be added dynamically to increase capacity

- Load balancing can be used to ensure that the servers are proportionately utilized

4.2.2 Performance

- Application framework designed to ensure good performance
- Use of caching techniques

4.2.3 Security

- SSL (Secure Socket Layer)
- Data encryption
- Firewall and DMZ provides security from external attacks
- Application level security in terms of user roles & responsibilities

4.2.3.1 Security architecture recommendations related to the following:

- Log in security
- Network security
- Operating System security
- Application related security
- Antivirus measures
- Intrusion Detection measures
- Intrusion prevention measures

4.2.4 Availability

- 24 x 7 availability

4.3 The proposed HIS should be based on fully redundant N-tier architecture which allows for scalability, central management of business rules, reduced maintenance and single point of deployment. The HIS should be able to work on a Microsoft based Server Operating System platform and have web-based clients.

4.3.1 Presentation Layer

- Web based/HTML or equivalents: platform independent
- Browser based client: thin client model
- Compatibility with multiple browsers
- No client installation for application is desirable

4.3.2 Web Tier

- IIS
- Microsoft compatible Application Development

4.3.3 Application Layer

- Reusability i.e. component based
- Standards driven
- High availability
- Ease of upgrade (i.e. server level upgrade only)
- The application should be compatible with Microsoft Server Operating System at the server side, but should allow any operating system on the client side to connect to the application over an intranet or the internet. It should also allow for Data mining and warehousing support,

provides multi-dimensional view of data, MIS and DSS reports are also desirable from the application.

4.3.4 Database Layer

- The database infrastructure to be used by the HIS is MS SQL Server

4.4 Interfaces with existing systems

The HIS is required to interface with the following systems that are in operation with the Government of Seychelles and the Seychelles Hospital:

4.4.1 National Population Database (NPD) System

The NPD system provides a unique identifier, the NIN (National Identification Number), to every citizen in Seychelles from birth till death and provides the information that is used to produce the National ID card for every citizen. The NIN is the main identifier used to identify individuals in the country and is also to be used in the HIS for patient identification. As such, the HIS is required to interface with the NPD system for accessing the NIN of patients in real-time.

4.4.2 Siemens RIS & PACS

The Seychelles hospital already have a state of the art Siemens Radiology Information System and PACS as part of its state of the art Diagnostics Center (Radiology & Medical Imaging). The vast majority of diagnostic equipment are of the Siemens make. As such, the requirement is for the HIS to be interfaced with and integrate the existing Siemens RIS and PACS software systems. His is do that medical images can be linked to the EMR of patients.

4.4.3 Treasury Information System (TIS) & accounting

All financial transactions undertaken by Government of Seychelles, which includes all the organizations under the Ministry of Health (MOH) are recorded in TIS. This is both for revenue and spending. TIS also incorporates budgets allocated by Government to the MOH and their breakdowns/allocations. As such, any billing or accounting modules that for part of HIS also needs to be interfaced with the TIS.

4.4.4 Government Human Resource Information System

All Government employees / public servants are recorded in the Government Human Resource Information System (HRIS). As such, any HR module which is part of HIS which is to be used for managing Healthcare personnel will need to be interfaced with the Government HRIS system.

4.4.5 Laboratory Equipment

The use of the existing LIS (Laboratory Information System) will be discontinued and will be replaced by the appropriate module of the HIS. This implies that all the current existing set of laboratory analysis equipment will need to be interfaced with the HIS. There is a possibility that existing data from the existing system may need to be migrated to the HIS.

The associated HIS module must also be able to easily incorporate new equipment that will be added to the laboratory over time.

4.4.6 Central Medical Stores Inventory System

The existing system inventory system in use in the Central Medical stores will be retired upon the introduction of the HIS and will be replaced by the use of the appropriate module in HIS. There is also a procurement management facility with this current system. As such, existing data from the existing system will need to be transferred to the relevant modules in HIS.

4.4.7 ASYCUDAWorld System

The Seychelles Customs utilizes the ASYCUDAWorld (AW) system as its main line of business system. This is a fully electronic transactional system and provides e-services to its clients for processing the clearing of goods by Customs. Since the HIS is anticipated to also provide a Procurement Module which will handle the clearing of supplied for the MOH; that module will also have to interface with the AW system. AW makes provision for the interfacing of date in the form of XML files in a specific format and structure. It is expected that HIS will need to provide such files through the Procurement Management Module.

4.5 Digital Signature

The HIS will need to support Digital Signing which makes us of a Public Key Infrastructure (PKI). The Digital Certificate which will be used generated digital signature will come on a smart card (contact chip) or a USB cryptographic token.

Digital signing facility is required since there may be legal requirements for certain physical forms to be signed and in the virtual environment, the implementation of this equivalent is digital signing (as prescribed in the Electronic Transaction Act).

5/ Mobility

In addition to access via fixed terminals (i.e. laptops / desktops) connected to LANs by cable, it is also expected that the HIS will be accessible over WLAN at by portable devices (e.g. specialized medical tablet devices). The HIS should be accessible by clinicians by the bedsides of their patients on mobile devices. The HIS should be able to be accessed by mobile devices running a range of mobile operating systems. The HIS supplier is also required to provide the recommended bandwidth for accessing HIS is an optimal manner for WAN connectivity (i.e. locations that are outside the LAN on which the HIS server/s are located on).

6/ Modules

The company will be expected to deliver an integrated HIS which comprises of several modules addressing a set of functionalities related to health service operations. It is required that every module represents a logical group of connected information and the provision of services related to the same and with the different modules interacting amongst themselves.

The different healthcare facilities should be able to choose from among the universal set of modules the ones that are applicable to them. The following are the targeted set of modules:

- Registration
- In-patient management
- Appointment Scheduling
- Drug Database
- Pharmacy Management
- Laboratory
- Operation Theatre
- Blood Bank
- CSSD (Central Sterile Supplies Department)
- Electronic Medical Records
- Radiology / Medical Imaging
- Environmental Health Monitoring
- Immunisation & Vaccination
- Mortuary Management
- Billing
- Human Resource Management
- Inventory Management
- Fix Asset Management
- Physical Facilities Management
- Security & Administration
- Management Reporting & Business Intelligence Analytics
- Procurement Management

The vendor should submit information about the modules that their proposed HIS have and indicate which of these modules corresponds to the functionalities of the modules provided in section 6.2.

6.2 Module Functionalities

The following describes the expected functionalities of the different modules:

6.2.1 Patient Registration

The Registration desk is the first point of contact when a patient visits a hospital. This module should assign every patient a unique Medical Registration (MR) number, which should be valid during the lifetime of a patient. In addition to the MR, the National Identification Number (NIN) is to be incorporated and used as the main identifier for patients. Once registered, patients need not mention their details during subsequent visits. There should be a search facility in the Registration module, which should enable the registration desk staff to retrieve details of a patient based on various parameters, such as the name, age, date of birth, and city, even if the patient does not remember the medical registration number. This module should also serve as a help desk at the hospitals front office.

Patient Registration will need to be interfaced with the National Population Database (NPD) system in Seychelles which is the registry of all valid NINs issued

IN relation to Accident & Emergency Services (Casualty Department), the module needs to provide for assignment of a unique patient number (temporary number) using a separate patient number series for non-communicative patients. Limited demographic information is captured. If the patient can be identified with the regular patient number, the case can be registered with the regular patient number, if required. In this situation, patient details are automatically displayed. Subsequently, for a non-communicative patient who was registered with a temporary number and holds a regular patient number, the records can be merged with the main medical records.

6.2.2 In-patient management

The In Patient Management module should automate the routine tasks of Wards and thus ensure better patient care. Tasks, such as transferring a patient from one ward to another, requesting laboratory tests, and requesting drugs prescribed by a doctor should be done in wards. Additional functions should include diet requests to the kitchen. A discharge request should be raised for a patient, once the doctor decides to discharge that patient. The Billing department should generate a bill for all the services rendered till that date. The patient should be given a discharge summary report and discharged immediately. This will ensure that there is no waiting time involved in preparing the bill or the discharge summary report. To handle corporate patients, the details of patients should be captured at the time of admission and their billing should be done accordingly.

This module needs to cater for electronic prescribing of pharmaceuticals from the wards or doctor's consulting rooms, and enable identification of drugs which are out of stock and those which are allowed to be prescribed.

The system is also to provide a platform for collaboration, communication and planning care by the whole care team, from diagnosis to therapy.

6.2.3 Appointment Scheduling

The Appointment Scheduling module should help in maintaining the schedule of various resources in a hospital, such as doctors, and laboratories. Pre-registration booking for appointments, fixing appointments at flexible time intervals, variable start time and end time should be available for these resources using the scheduler. This module should be used to book the next available slot on the approximate date. Public holidays should be considered automatically while scheduling appointments and a facility for viewing the schedule of multiple resources should also be available.

6.2.4. Drug Database

This would have details of all drugs and their brand names. It would also hold details of the drug like Indications of use, mode of action, side effects, contraindications of use etc. This should facilitate the doctor as a ready reckoner for the drug. There should also be facility for adding/deleting brand names by end users. Each end-user may have own favorite lists of the most frequently used brands.

6.2.6. Laboratory

The Laboratory module should enable users to maintain information about the status of a patient, and text/numeric results of various services such as clinical pathology, X-ray, and ultra sound, based on the investigation requests made for patients. Authorized clinicians should be able to make a request for laboratory tests for a patient from various locations in a hospital including wards, billing, sample collection point, or at the laboratory. This module should also take care of test request reversals, that is, requested tests should be cancelled if it is found that the test requested need not be performed. The Laboratory module should be integrated with the IP/OP Registration, Wards and Billing modules. For In

Patients, lab test charges should be automatically posted to Billing. Laboratory equipment should also be integrated with HIS to facilitate automatic storage of text/numeric results directly, on completion of tests.

6.2.7 Operation Theatre

The Operation Theatre module should be used for efficient management of the operation theatre. A checklist for each kind of surgery should aid the staff in gearing up for a surgery. Pre-defining standard notes should aid the staff in generating pre-operative, operative, and post-operative notes. Surgical items used during the surgery should be indented through the system from the Central Sterile Supplies Department. The system should also interface with the Blood Bank module to ensure that requirement for blood and blood products are immediately taken care of. This module should automate majority of the routine tasks of hospital personnel, who in turn will be to concentrate on patient care.

6.2.8 Blood Bank

The Blood Bank module should be a comprehensive system that should maintain complete information about donors, along with the details of blood donation. This module should be linked to the operation theatre & wards, and whenever there is a surgery, blood requirement should be indicated to the blood bank. Availability of blood, details of cross matching with patient's blood, and transfusion reactions should be recorded in the system. The system should also provide for interactions with external blood banks, both for receipt of blood bags and delivery of blood bags from external banks. There should be facility for expiry date notifications.

6.2.9 Instrument sterilization

Sterilization of surgical instruments, dressing sets and linen is very important prior to their use. CSSD module should provide sterile instruments, dressing sets and linen to operation theatres and wards. The system should also facilitate procurement of items, stitching of dressing sets. The autoclave register should be maintained to record the details of sterilization. The CSSD module should automate the entire spectrum of activities including details of instruments going for sterilization, instruments sterilized, instruments supplied, and instruments received from operation theatres/ wards.

6.2.10 Electronic Medical Records (EMR)

The Electronic Medical Records module should facilitate complete online storage of patients' Medical records. The complete history of a patient, along with diagnosis and prescription should be maintained online. There is a provision for a doctor to prescribe tests from the Lab module and also medication from the Pharmacy module. Users of the Lab and Pharmacy modules should be able to view these requests from their respective locations and provide service to patients. The ICU monitoring chart should help the doctor to monitor the hourly/daily update of vitals. Vitals and frequency of monitoring should be decided for each patient. This helps the doctor to analyze the trend of the vitals for a patient and aids in decision-making. Nurses, doctors and consultants should be able to enter progress notes of a patient, which should then be available for ready reference. Patient data should be analyzed on various parameters like disease, procedure, age, sex, and duration of stay.

It is expected that via the EMR, medical/sick leaves and referrals can be initiated and their history viewed from it.

The EMR also needs to cater for Doctors' Notes and for treatment pathways. Physiotherapy and occupational therapy records are also to be incorporated in the EMR.

6.2.11 Radiology / Medical Imaging

Registration of patients at Radiology Department At the registration counter of Radiology Department, Patient should get registered for the test. For out patients the bill amount should be collected and the Order Number should be generated. For In Patients payments is not necessary during that time. The service amount should be accumulated against In-Patient Registration number. With the Order number the patient goes to the Radiology Department and to the particular lab where the test has to be done, where a registration is done for that test which generates a Registration number. Registration Number should keep track of the patient's request status. A very few users, who have the authorization for that, should be able to do the cancellation of the test requisition. After the patient getting registered, patient will proceed to the respective room (facility) to avail the services.

After taking the radiology test, the radiologist will enter the report of the test. An authorized specialist would verify the result before generating the report. However even before the report is generated by the radiologist, the unreported image should be available for viewing at any terminal by the physician, for a rapid patient service.

It is to be noted that this module will need to be interfaced with the existing Siemens PACS and RIS in operation in Seychelles Hospital.

6.2.12 Pharmacy Management

The medicines that are prescribed by a medical practitioner are supplied by the Pharmacy in the healthcare system. This Pharmacy has a direct link to the Central Medical Store as well which replenishes the stock at the Pharmacy.

The module is to cater for the full stock control at the pharmacy, all stock transactions, dispensing, multiple pharmacy location designation and point of sale facility. Printing and reading of barcode labels ate also to be supported.

6.2.13 Mortuary Management

The module is to cater for the management of the mortuary. If an inpatient passes away or a person is brought dead then he/she is sent to the mortuary at the main hospital. This mortuary unit has linkages with other ministries (for e.g. death registration / Civil Status).

This module will need to be interfaced with the system at the Civil Status office which records births and deaths.

6.2.14 Environmental Health Monitoring

This module is to support the work functions of environmental health officers. This includes the capturing of information related to the status of sanitation and other environmental health factors (e,g, water) in the wider community. This also relates to mitigation actions taken (e.g. spraying / fogging to control disease vectors). It is also expected that this module will assist the planning/coordination of work of environmental health officers in relation to monitoring activities.

This module has to allow the tracking visitors entering Seychelles for the diseases that they may be carrying and whether the required processes have been followed as recommended.

It is also to allow for the presentation of data about disease cases locally to identify possible outbreaks and the evolution of such in time.

6.2.15 Immunization & Vaccination:
The Ministry of Health in Seychelles is also responsible for the national vaccination programme and this is delivered in the community through its clinics/health centers in the community. This module is to manage the administration of immunisation and vaccination to the citizens of Seychelles.

6.2.16 Billing
The Patient Billing is integrated with Accounts Receivable (Debtors) module to post invoices and customer receipts. A debtors' sub-system is available for follow-up of deferred cash patients, which relates to patients who are settling in cash over an extended period. Cashier functions are available to process different payment receipts and refunds in various currencies. Receipts can pertain to payments against an account, from a customer for settlement against an invoice adjustable deposit, refundable deposit, pre-payments, miscellaneous, etc.

The billing system and invoicing module must also be interfaced with the Government Treasury Information System (TIS). This is part of the Government wide accounting system for the Seychelles Government. All transactions related to Government has to be recorded in TIS.

It is to be noted that in the Seychelles healthcare at any level is free for citizens. As such, the billing accounting module is principally to keep track of cost of healthcare. This is to be on a per patient basis. Healthcare service is not free for non-citizens and billing in this context is to be applied.

6.2.17 Human Resources Management
This module takes care of information related to the complete human resources in the whole of the Ministry of Health and related organisations, including the hospitals and health centers, which would cover the skillsets available in the ministry, the capability building requirements for the same, their compensation structure, leaves management, remuneration processing, performance management and the like.

This module will also need to be interfaced with the central Government Human Resource Information System (HRIS).

6.2.18 Inventory Management
This module would involve management of the information related to inventory in the Central Medical Store, including medical equipment, drugs and medicines and other movable assets. The drugs and medicines are also integrated with the Pharmacy module.

There is a central medical store system which is in operation and the conversion of data from that system to the new system will be required. The inventory module will be replacing the existing system in operation.

6.2.19 Fixed Asset Management
This module would involve management of the information related to the inventory in MoH, that is, the fixed assets that are present and are owned by the MOH. This module is directly related to other clinical modules such as Ward and Bed management, Operation Theatres etc.

This module is also to assist with the maintenance of biomedical equipment. It is to allow the identification, documentation and repair/correction of failures or degradation of any asset.

16.2.20 Physical Facilities Management
This module is to cater to the management of physical facilities present and owned by the MOH and would include such assets as buildings etc. Any additions or changes to current hospitals and health centers can be reflected on this module. Through this module facility; repair and maintenance requests can also be made, tracked and coordinated.

6.2.21 Security & Administration
The Security module should provide controls to access information available in the application. It deals with user level security for the other modules and their functions. Each user should have access to a predefined set of actions (add/modify/delete/query) on various functions in a given module. User-defined error and help messages should also be maintained and customized in this module. The General Administration module should deal with the configuration of the HIS. The physical layout of the hospital & other clinical locations, their logical partitioning into departments, specialization details and various services should be defined in this module.

This module is also to cater for detection measures such as audit trails to allow the identification of potential cases of information leakage or fraudulent activities.

6.2.22 Management Reporting & Business Intelligence Analytics
The objective of this module is to support decision-making. Many variables need to be taken into account when deriving trends and other statistical analyses aimed at facilitating decision-making at the MOH. This module in the HIS needs to allow for this and facilitate it.

It is expected that the HIS is to provide facility for data archival and warehousing. This is so that historical trends analysis can be done over a long tome period.

The module also needs to cater for the reporting of Key Performance Indicators (KPIs) of doctors, nurses, health centers, specialized centers and the hospital, to MOH management. These report can be used for performance appraisal and decision-support.

6.2.23 Procurement Management
The module is to cater for the processing of purchase requests (PR) for the MOH. The module will have to cater for purchase requests to be made electronically from clinics and other locations within the MOH. It should also cater for the recording of quotations (including actual copies) and their comparisons for supporting purchasing decisions. Purchase Orders (PO) are also to be issued by the system through PR raised.

The module will also have to interface with the Government wide TIS system of the Ministry of Finance since POs are issued through TIS for all Government organisations. This module will also have to interface with the Inventory and Pharmacy modules. As requests for items are made by clinics and others, the Inventory or Pharmacy module will flag the Procurement Management module if stock is not available. The procurement process is then handled by that module leading to the issuing of the PO for the items. This is also to include the clearing process for goods being imported in the country. The module may also have to interface with the Government Customs system for clearing of goods. Upon the delivery of goods, the system is also to record the Delivery Note and issue a GRN (Goods Received Note) which is also associated with the PO for that item/goods. These must also be linked to the invoice of the item.

7/ Hardware Requirements for HIS (Server Sizing)

The vendor should provide appropriate Industry standard high-end configuration for the servers and related infrastructure that will be required to host the HIS. This should be aligned to the expected functionality requirements of the HIS and also from the perspective of current and future needs of response time, data storage, archival etc. There will be two server infrastructures that will be hosting the HIS.

7.1 Backup Server Infrastructure

The Backup server infrastructure should be able to take-over if the Primary Server fails (in case of server crash, disaster/fire, etc.). As and when the Primary Server becomes live again, it should automatically synchronize with the data on Secondary Server. This is to avoid Doctors and clinicians from being without access to patent records and patient images at any point of time.

SECTION V: SERVICES & STATISTICS

HEALTH CARE AGENCY (HCA)

A. Facilities and Services

Facilities	Services	Remarks
Seychelles Hospital – Mont Fleuri	In-patient	238 beds
	Haemodialysis -	28 Machines
	Oncology -	10 beds/chairs
	Operating Theatres	5 operating rooms
	Central Sterilization Service Department	
	Specialist Out-Patient Clinics (SOPD)	40,020 patients per year
	Diagnostic Centre - Radiology	Siemens – PACS/RIS
	Clinical Laboratory	660,604 tests per year (Mahe, Praslin, La Digue) private and public
	Blood Transfusion Unit	
	Physiotherapy	
	Occupational Therapy	
	Ward Pharmacy	
	Specialist Outpatient Department Pharmacy	
	Antenatal Clinic	
	Casualty (Accident & Emergency)	
	Emergency Call Centre and Ambulance Service	
	Labor room suits	3
	Hyperbaric Oxygen Therapy	6 seats capacity
	Nutrition/Diet Unit	
Seychelles Hospital – Wellness Centre	In-patient	38 beds
	Out-patient services	
Seychelles Hospital – North East Point Rehabilitation Hospital	In-patient	29 beds
Seychelles Hospital – Hospice	In-patient	6 beds
North East Point – Rehabilitation outpatients	Out-patient	
Community Health Services	14 Health Centres	Including Youth Health Centre
	Anse Royale Hospital	30 beds – Primary
	Baie Ste Anne Hospital	19 beds – Primary

	La Digue Hospital	6 beds – Primary
	North East Point – Home for the Elderly	143 beds - Home
	North East Point – Mental Home	40 beds - Home
	Maternal Health Programme	
	Oral Health Services	Dental Services
	Antenatal Health Programme	
	Child Health Programme	
	Immunization Programme	
	School Health Programme	
	Domiciliary Care Programme	
	Nutrition Programme	
Support Services	Waste management	
	Housekeeping	
	Catering	
	Cleaning	
	Maintenance – Aircon and intrafrastructure	
	Biomedical Engineering	
	Finance	
	Oxygen Plant	
	Procurement	
	Central Medical Store	
	Project Implementation Unit	
	Customer Care Unit	
	Porter Services	
	Heatlh and Safety	
	Quality Assurance	

PUBLIC HEALTH AUTHORITY (PHA)

A. Facilities and Services

Facilities	Services	Remarks
Public Health Authority Buildings at Mont Fleuri	Public Health (Environmental) services	
	Disease surveillance and response	
	Communicable control disease	
	Occupational health services	
	Public Health lab	
	Diabetic clinic	
	Child Development study	A specific longitudinal project which involves primarily data collection

HUMAN RESOURCE

Cadres	Number	Remarks
Staff – total	1648	HCA, PHA & MOH consolidated
Doctors – total	167	
Specialists	47	
Dental staff	94	
Dentists	23	
Nurses – total	434	
Nurse managers	20	
Nurse in Charge	26	
Pharmacists	8	
Pharmaceutical tech/dispenser/production assistants	52	
Paramedical staff	498	
Laboratory staff	66	
Administration staff	84	
Support staff	222	