Section 5

Section I
Terms of Reference

Services Requirements

IOM- Laboratory Information Management System Interface (LIMS) Integration with laboratory instruments Solution Pilot for IOM-Manila clinic

Laboratory Instruments integration with a .NET/C# application

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1. Executive Summary

IOM is looking for a system development partner who can develop a .NET/C# software application which will interface with laboratory instruments from Manila clinic:

1. Cobas c111
2. Cobas c411
3. Dynex DS2
4. BD BACTEC™ MGIT™ 960 (two units)
5. GeneExpert (three units)

The goals of this application are:

1. Prove the integration of the Manila clinic laboratory instruments, with a test .NET/C# application.
2. Prove the test results are available into a standard format as HL7, ASTM.
3. Prove that the substrings of information, as test results, unit of measures and others are extracted from each test result message, sent by an instrument.

The business objective of interfacing these two systems is to automate data transmission between them, eliminate the human errors and reduce the operational costs.

2. Organization information

Established in 1951, IOM is an international intergovernmental organization that recently joined the United Nations system. With over 160 member states and offices in more than 150 countries, the breadth and depth of IOM's work reflect a level of experience and expertise in providing migrant services that is unmatched in the international community. IOM provides advice and services to governments to promote the principle that humane and orderly migration benefits migrants and society.

IOM collaborates with its partners in the international community to meet the growing operational challenges of migration, advance understanding of migration issues, encourage social and economic development through migration, and uphold the well-being and human rights of migrants. IOM works to help ensure the orderly and humane management of migration, to promote international cooperation on migration issues, to assist in the search for practical solutions to migration problems and to provide humanitarian assistance to migrants in need, including refugees and internally displaced people.

IOM provides its services through a world-wide network of more than 400 field locations in more than 150 countries, including 9 Regional Offices, the Head Quarters in Geneva, and 2 Administrative Centers located in Panama and Manila, which provide core support in the areas of information technology, finance, human resources and other administrative services to IOM's network of offices.

3. Background

This pilot project is intended to prepare the integration of LIMS system with the IOM laboratories (38 all over the world). Other phases will follow.

3.1. LIMS system

LIMS system supports the laboratory information management needs of IOM's Laboratory Unit. The system manages various aspects of laboratory services including registration, specimen collection, appointments, entering examination results and reporting.

3.2. Other

The number of expected test results is approximately 200 per hour, for Manila clinic, from all the instruments. The systems should be able to support 10 times more, for one hour.

4. Project description

The laboratory instruments need to be configured to output the test results via the existing ports (RS232, Ethernet, USB, etc.). The vendor is responsible for processing the test results data and converting it to HL7 and ASTM frames, over TCP/IP protocol.
The .NET/C# application that will be delivered is intended to receive, record and display the above-mentioned data (HL7 and ASTM frames).

4.1. Requirements

1. Information flow: unidirectional, from instruments to a .NET application. This is equivalent to no change in the current operations of the lab staff.
2. The vendor will configure the instruments to output the test results data, when available. The laboratory instruments drivers should be included.
3. The vendor will provide a .NET Windows and the source code to IOM. The application should:
    a. Display / list the received messages, as is, with a timestamp prefix
    b. Extract and display the substrings of information from the one test results, as:
        i. Timestamp
        ii. Sample ID
        iii. Test
        iv. Result
        v. Unit of measures
    c. Save / log the data into files (configurable, daily and by time interval) or a local, free of charges, database.
    d. Clear the messages from the display window(s)
    e. Copy / paste of the received messages
    f. Display and log the error messages.
    g. Run one week without interruption.

5. Scope

1. The vendor is expected to provide a development team with the following skills: development of C#/NET Windows / Web applications.
2. The vendor is responsible for team composition and team management.
3. The vendor is responsible with the elasticity of the team (as example, he can start with one developer and add another one later).
4. The vendor team will be supported by:
    a. Laboratory staff from Manila clinic
    b. Instruments vendors technical representatives
    c. Migration Health Information (MHI) Project Manager
    d. Business Analyst, for requirement, business process, testing and acceptance.
    e. Software development specialist for access, code review and related.
5. The system will be accepted by IOM
6. Azure DevOps tools will be used to manage the backlogs.
7. IOM will provide the development and test environments, if needed.
8. IOM will provide coding standards.
9. Working outside of regular working hours may be required (to accommodate the laboratory operations).
10. Visit at IOM Manila clinic will be required.

6. Exclusions

The IOM-LIMS application changes are out of scope.
The .NET application is intended to be used for the next phases of integration.

7. Deliverables

The company will deliver a complete, fully functional product, as detailed by IOM.

1. System
    a. The company will provide IOM a fully functional system integration between a .NET application and the laboratory instruments that have been explained above.
    b. Any other software (including drivers) or hardware, between the laboratory instruments and the .NET application.
2. Documentation
    a. Full documentation of the product needs to be provided once the project has been closed.
        i. Code is documented as per IOM standards.
    b. Specification documentation of the laboratory instruments to .NET application
    c. Sprint reports from JIRA and / or Azure DevOps backlogs
3. Guarantee
    a. 3 months guarantee whereby we can report any bugs during this period. This should be fixed without any extra cost or raising a Change Request.

8. Monitoring

IOM uses the Scrum methodology to track its projects. We will collaborate with the company to define the different sprints, which will be 2-4 weeks.
Azure DevOps will be used for backlog management.
The code quality measurements should show a positive trend between the start and the end of the project.

9. References

The company that wins this project needs to show that they have successfully implemented .NET / C# projects.
The company should have at least a total of five customers, some of which IOM would like to interview.

10. Timeline/Timescale

IOM expects the partner to start the project by the 4 of March 2024 and deliver the project April 1, 2024.
The project delivery should also include a 3-month guarantee whereby we can report any bugs during this period. This should be fixed without any extra cost or raising a Change Request.

11. Annexes

1. Coding standards
    a. SDU-SoftwareDevelopmentStandards-080223-0258-14.pdf

Please note that this is neither a contract nor a service confirmation document. Thank you

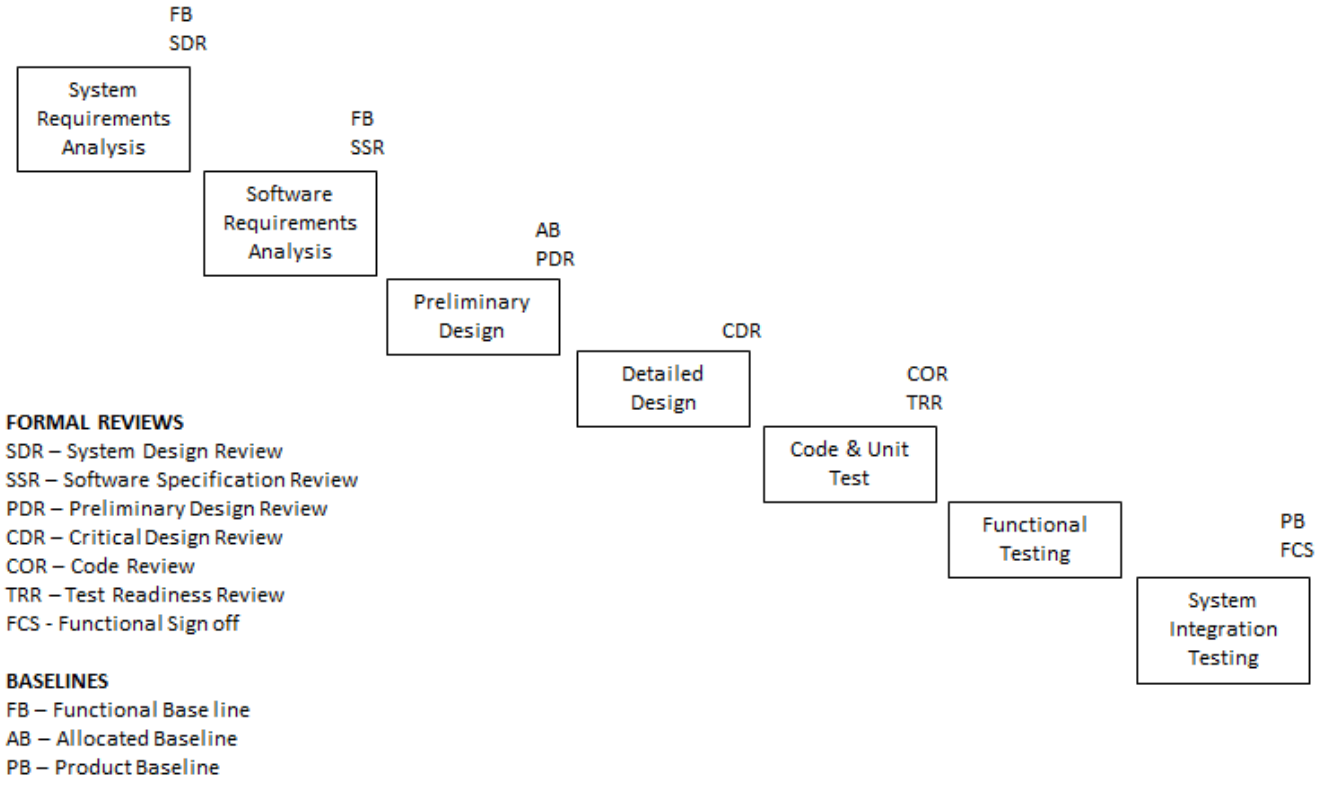
Software Development Standards

Introduction

The **Software Development Standards** (SDS) defines and establishes the process by which all software will be developed for a given project. It shall specify a life cycle (a series of phases) and the activities or processes to be performed in each phase. This defines "what" has to be done, "when" should it be done, "who" does it, and detail "how" it will be achieved.

Objectives

- To establish and document a standardized and coherent methodology for the development activities of a given software project
- To provide a reference for common terminology, definition, and vocabulary for software development
- The standard shall establish common expectations about the process and documentation to be prepared



Overview of Software Development Process

Organization

The Standards are organized into the various **Knowledge Areas (KAs)** of software engineering. The KAs are as follows:

- System/ Software Requirements
- Software Design
- Software Construction
- Software Testing
- Software Maintenance
- Software Configuration Management
- Software Quality
- Software Engineering Management
- Software Engineering Tools and Methods