



A division of ACCESS Health International

Microservice Specification

Lab Information System



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1. Functional Area –Lab Information System

1.1. Purpose

The document describes the Business Requirements Specifications (BRS) for the Lab Information System.

LIS is software that records, manages, and stores data for clinical laboratories. The software is designed to make labs that process large quantities of samples for research and development (R&D), manufacturing and clinical research more efficient and effective.

Intended Audience

This document is intended for the Product Engineering team to commence development of ‘Lab Information System’ microservice and the audience would comprise of

- 1.1.1. Development, Design & Implementation Team which may include Architects, Designers, Developers, and Business Analysts
- 1.1.2. Key stakeholders in the government at central and state levels

1.2. Overview

This microservice deals with various functionalities for the Lab Information System from laboratory test orders to lab instruments, tracking those orders, and then recording the results, typically at a searchable database. This LIS micro service will help the doctor in validating the provisional diagnosis and in giving treatment to the patient. The primary purpose of the Lab Information System is to improve the efficiency in lab operations by cutting down the manual tasks.

1.3. Scope & Not in Scope

Functionality scope includes:

- Order Entry
- Testing
- Result Entry
- Inquiry
- Reporting

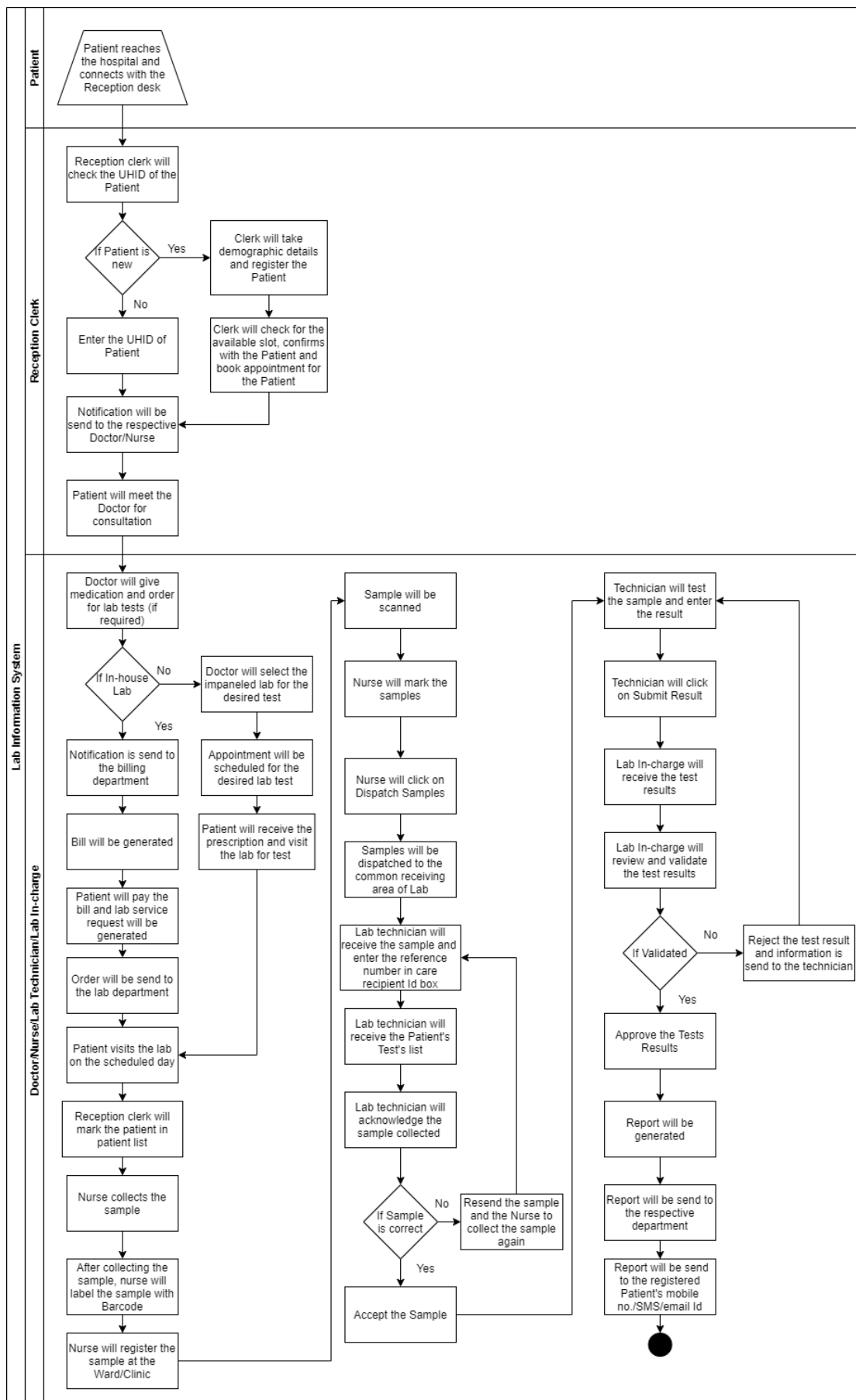
1.4. Lab Information System

Business Process Flow for Lab Information System

Description	Lab Information System (LIS) is computer software that processes, stores and manages data from all the stages of medical process and tests. LIS is used to coordinate varieties of inpatient and outpatient medical testing, including hematology, chemistry, immunology, pathology and microbiology. Lab Information System has features that controls patient check-In, order entry, specimen processing, testing, result entry, inquiry, and patient demographics.
Users	OP Reception Clerk, Doctor, Nurse, Patient, Lab Technician, Lab In-charge
Pre-requisites	Registered Patient, Doctor has placed the order for patient’s lab test
Business Process Details	Once the patient reaches the facility for consultation, the doctor gets the notification. Doctor looks for the patient in the active list and opens the patient dashboard. Based on the patient’s complaint (like vomiting/ fever/ skin in eye) the doctor makes an order for provisional diagnosis. Doctor clicks on the order tab and selects the tests to be given, here in the order tab based on the samples various tests are available. When the doctor gives an order for a lab test, order entry is generated and appointment is given to the patient for lab test. Once the patient reaches the laboratory, the reception clerk marks the patient in the patient test list and a bill is generated for the test. Billing personnel confirms the order. Nurse takes the sample and labels it with the barcode. Lab Technician acknowledges the sample and enters the result. Result is sent to the lab in-charge, who validates and confirms the result.

	Once the result is validated, the result is sent to the doctor's page as well as to the registered patient's mobile number. Based on the results, the doctor can confirm the provisional diagnosis. If any change is required, the doctor will go back to the consultation tab, click on edit and make the necessary changes required. According to the diagnosis, the doctor will give treatment to the patient.
Steps	<ul style="list-style-type: none"> ● Patient walks-into the facility for lab test ● Doctor places the order for lab test ● If it is an in-house lab, order goes to the billing desk. Or else, the doctor will select the empaneled lab for the desired test. ● Billing personnel will confirm the order. ● Order will be sent to the lab department. ● Then an appointment will be scheduled for the lab test. ● When a patient reaches the lab on the scheduled day, the reception clerk marks the patient in the patient list. ● Nurse takes the sample and labels it with the barcode. The sample is registered and scanned with barcode. ● Sample is then dispatched to the common receiving area of the lab. ● Lab technician receives the sample and marks the sample as received in the system. ● Lab technician tests the sample and enters the result. ● Lab in-charge receives the result and validates it ● Report is generated and send it to respective doctor ● Notification is send to the respective doctor ● Report details are sent to patient's registered mobile number & email ID; and a system alert to the relevant facility
Outputs	<ul style="list-style-type: none"> ● Tests Report ● Email/ WhatsApp/ SMS
Messages & Alerts	<ul style="list-style-type: none"> ● Message to relevant provider/ department for patient appointment for lab test ● Message to patient/ family member for lab test report

1.5. Visio: In case the patient directly walks-in



1.1. Required MDDS Data Elements

1.1.1. Entity: Generic

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Time	05.001.0001	HH:MM: SS	8	
Date	G00.01	dd/mm/yyyy	10	
FIR No.	05.001.0002	Varchar	50	
Alternate Identifier Type	05.001.0003	Integer	2	
Alternate Identifier	05.001.0004	Varchar	254	
Alternate Identifier Format	05.001.0005	Bytes	20	
Comments	05.001.0007	Varchar	99	
Healthcare Application Number	05.001.0019	Integer	5	
Code System Qualifier Type	05.001.0020	Char	1	
Code System Qualifier	05.001.0021	Varchar	15	
System of Medicine	05.001.0022	Integer	2	
Document ID	05.001.0023	Varchar	50	
Reference Document ID	05.001.0024	Varchar	50	
Non-Clinical Document Type	05.001.0025	Integer	2	
Reference Document	05.001.0026	Varchar	254	
Non-Clinical Document	05.001.0027	Varchar	4096	

1.1.2. Entity: Person

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Unique Health Identification Number	NDHB	Integer	12	Refer to G01.01
Alternate Unique Identification Number (UID) Type	05.002.0001	Integer	2	
Alternate Unique Identification Number (UID)	05.002.0002	Varchar	Max. Size =18 10 - PAN Card 08 - Passport No. 18 - Voter ID 18 - Any other Identifier	

1.1.3. Entity: Patient

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Provider's Patient ID	05.003.0001	Varchar	18	
Patient Arrival Time	05.003.0014	HH:MM:SS	8	
Patient Arrival Date	05.003.0015	dd/mm/yyyy	10	

Reason for visit	05.003.0016	Varchar	99	
Patient Landline Number	05.003.0011	Varchar	8	
Patient Mobile Number	05.003.0012	Char	10	
Patient Email Address/URL	05.005.0008	Varchar	254	

1.1.4. Entity: Provider

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Unique Individual Health Care Provider Number	05.005.0001	Varchar	18	
Unique Individual Health Care Provider Number Type	05.005.0002	Integer	2	Refer to CD05.008.
Care Provider Landline Telephone Number	05.005.0006	Varchar	8	Refer to G00.06-02-05
Care Provider Mobile Number	05.005.0007	Char	10	Refer to G00.09
Care Provider Email Address/URL	05.005.0008	Varchar	254	Refer to G01.02
Care Provider Name	05.005.0009	Varchar, For short name and full name in recognized official language (Storage in UNICODE Standard UTF-8)	Max. size 30 - Short Name in English 99- Full Name in English 30- Short Name in Recognized Official Language 99- Full Name in Recognized Official Language	Refer to G01.02
Health Service Provider Role code	05.005.0010	Integer	2	Refer to CD05.009
Health Service Provider Role Free Text	05.005.0011	Varchar	99	
Health Service Provider Type	05.005.0012	Integer	2	Refer to CD05.010

1.1.5. Entity: Facility

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Unique Facility Identification Number	05.008.0001	Integer	10	Refer to CD05.001
Facility Type Code	05.008.0002	Integer	2	Refer to CD05.002
Facility Service Code	05.008.0009	Varchar	18	Refer to CD05.043
Facility Specialty Code	05.008.0010	Integer	3	Refer to CD05.011
Department Name	05.008.0015	Varchar	99	Refer to CD05.090
Referral Facility Identification Number	05.008.0019	Integer	10	Refer to CD05.001
Referral Facility Type Code	05.008.0020	Integer	2	Refer to CD05.002

Referral from Facility Identification Number	05.008.0021	Integer	10	Refer to CD05.001
Referral from Facility Type Code	05.008.0022	Integer	2	Refer to CD05.002
Facility Global Unique Identifier (GUID)	05.008.0025	Bits	26	

1.1.6. Entity: Encounter

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Encounter ID	05.010.0001	Varchar	18	
Encounter Type	05.010.0002	Integer	2	
Encounter Type Description	05.010.0003	Varchar	254	
Encounter Time	05.010.0004	HH:MM:SS	8	
Encounter Date	05.010.0005	Date(dd/mm/yyyy)	10	

1.1.7. Entity: Clinical Notes

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Author Time	05.019.0001	HH:MM:SS	8	
Author Date	05.019.0002	Date(dd/mm/yyyy)	10	Refer to Date (G00.01)
Reference	05.019.0003	Varchar	99	
Information Source Name	05.019.0004	Varchar	99	
Clinical Document	05.019.0005	Varchar	4096	
Clinical Document Type	05.019.0006	Integer	2	
Discharge Instructions	05.019.0007	Varchar	254	
Care Plan Comment	05.019.0008	Varchar	99	
Patient Age at onset of health condition	05.019.0009	Age-year(s) (yyy) Integer(3) Age-Month(s) (mm) Integer(2) Age-Day(s) (dd) Integer (2) 999,99,99 no preceding zero [years, months, days]	7	

1.1.8. Entity: Lab

Data Elements	MDDS Codes	Data Format	Maximum Size	Code Directory
Result Date	05.021.0001	Date(dd/mm/yyyy)	10	
Result Time	05.021.0002	HH:MM:SS	8	
Result Type	05.021.0003	Varchar	10	
Result Status	05.021.0004	Char	2	
Result Value	05.021.0005	Varchar	20	
Result Interpretation	05.021.0006	Integer	2	
Result Reference Range - lower limit	05.021.0007	Integer	7	
Result Reference Range - Upper limit	05.021.0008	Integer	7	
Result Category	05.021.0009	Varchar	10	
Accession Source	05.021.0010	Varchar	99	

Specimen Type	05.021.0011	Integer	3	
Specimen Collection Method	05.021.0012	Integer	2	
Specimen Source Site Modifier	05.021.0013	Varchar	99	
Specimen Risk	05.021.0014	Integer	2	
Specimen collection Date	05.021.0015	Date(dd/mm/yyyy)	10	
Specimen Collection Time	05.021.0016	HH:MM:SS	8	
Specimen Received Date	05.021.0017	Date(dd/mm/yyyy)	10	
Specimen Received Time	05.021.0018	HH:MM:SS	8	
Specimen Availability Indicator	05.021.0019	Integer	1	
Specimen Rejection reason	05.021.0020	Integer	2	
Number of Specimen Containers	05.021.0021	Integer	2	
Lab Order Code	05.021.0022	Varchar	10	
Lab ID	05.021.0023	Integer	10	
Lab Type	05.021.0024	Integer	1	
Lab Result ID	05.021.0025	Varchar	10	
Lab Specimen Collector ID	05.021.0026	Varchar	99	
Lab Specimen ID	05.021.0027	Varchar	10	
Lab Accession ID	05.021.0028	Varchar	16	
Specimen Parent ID	05.021.0029	Varchar	10	
Specimen Source Site ID	05.021.0030	Integer	3	

