



Ministry of Agriculture and Forests Royal Government of Bhutan



User Requirements

Laboratory Information Management System (LIMS)

National Food Testing Laboratory (NFTL), BAFRA

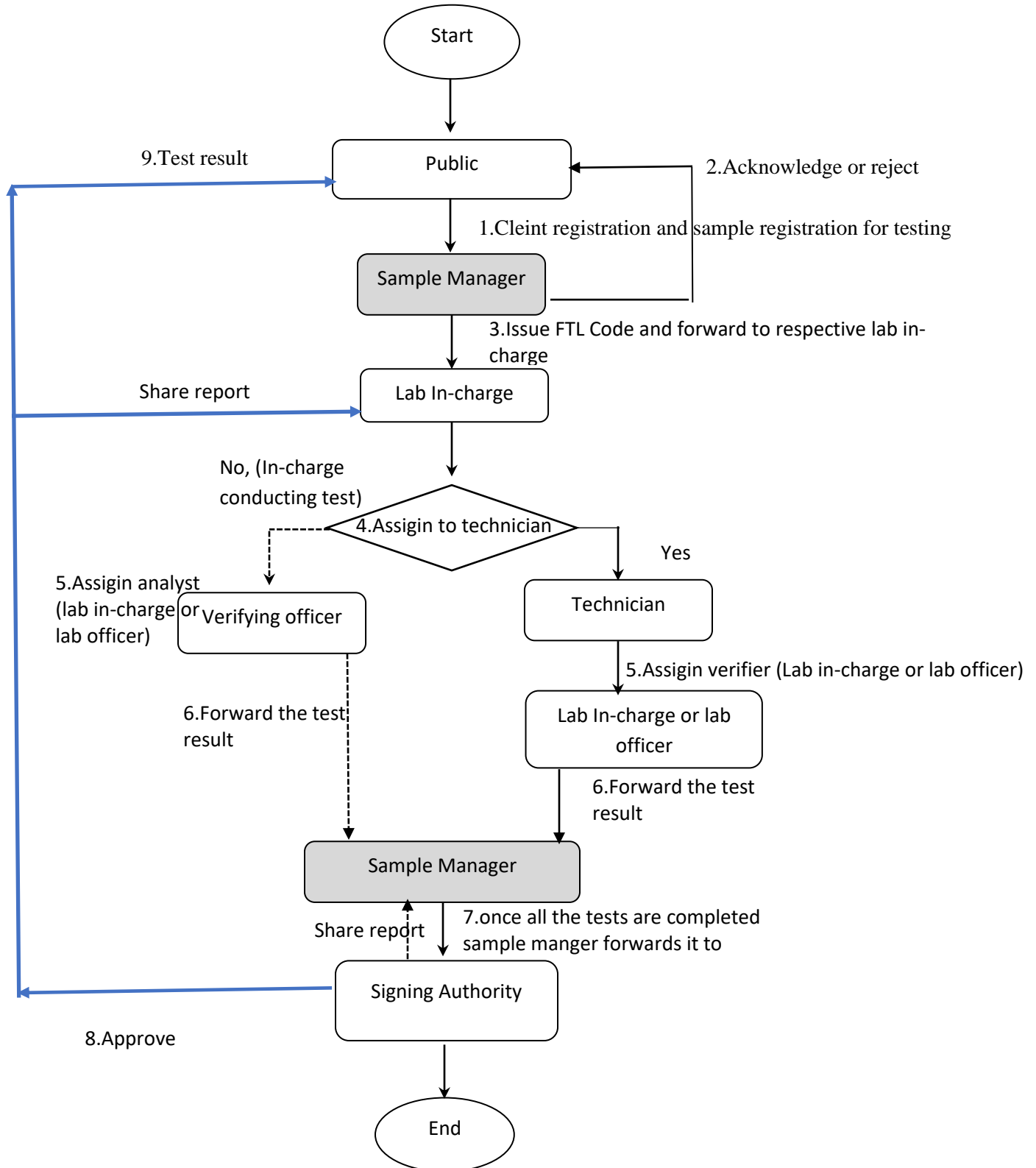
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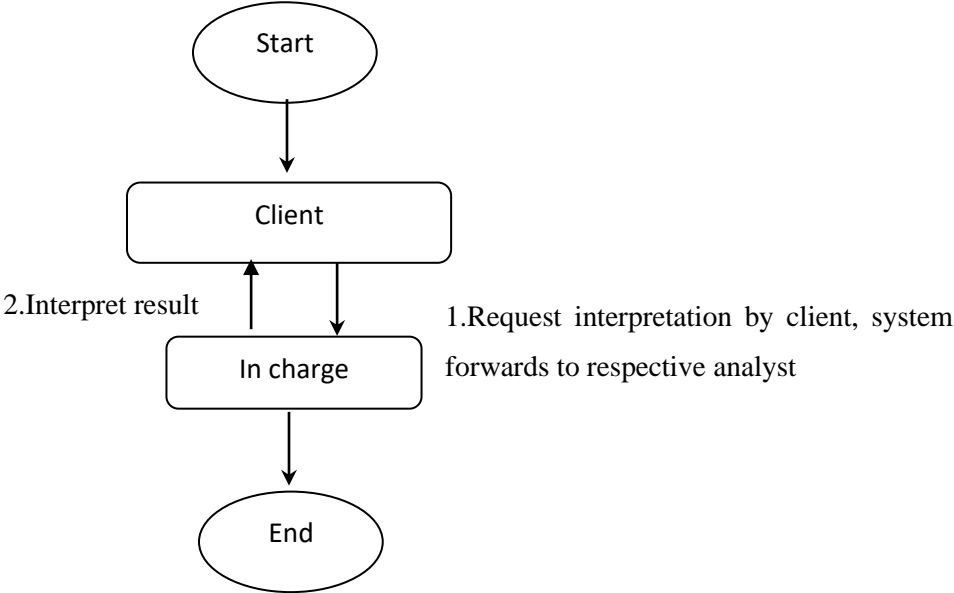
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1. Laboratory Information Management System Process flow.

1.1 Process for Sample testing



1.2 Process for Interpretation of test result if requested



2. User Roles and Functionalities

Sl No	Roles/Functionalities	Users					
		Client	Sample Manager	Store In-charge	Lab In-charge	Lab officer	Lab Technician
1	Client Registration	✓					
2	Sample Registration	✓					
3	Test Report	✓					
4	Track Report	✓					
5	Seek interpretation	✓					
6	Test Request received		✓				
7	Test result received /status		✓				
8	Assign Test				✓		
9	Conduct Test				✓	✓	✓
10	Analyze Test				✓	✓	
11	Endorse Test (Signing Authority)				✓	✓	
12	Provide Test Interpretation				✓	✓	
13	Individual Report		✓		✓	✓	✓
14	Officer in-charge (Overall report)				✓	✓	
15	Stock entry			✓			
16	Stock usage			✓	✓	✓	✓

*** For Analyze Test, Endorse Test (Signing Authority), and Officer in-charge (Overall report) there should be an option while creating user whether to give the roles or not.

3. User Interface

3.1 Client Registration/ Signup Interface (Public)

Document Type *: **CID or Passport**(selection)

A) If **CID** is selected display following.

CID No: * [upon feeding CID No. details below should be fetched from DCRC]		
Name:	Dzongkhag:	Dungkhag:
Gewog:	Village:	

Details to fill in by client:

Contact No: *	Email address: *	Client Type: * (Choose from list box Annex 1.if others specify)
Name of Agency/institution: *	License No./Reg No/EID	User Name: *
Password: *		

*** With this details Client should be able to register.

B) If **Passport** is selected following information needs to be furnished.

Passport No: *	Nationality: *	Contact No: *
Email address: *	Client Type: * (Choose from list box Annex 1, if others, specify)	Name of Agency/institution: *
License No./Reg No/EID	User Name: *	Password: *

*** With this details Client should be able to register.

*** Once client registration is approved by NFTL, client can login and register samples for testing.

3.2 Sample Registration Interface

3.2.1 Test requested: * (Based on the Mapping, Annex 2. Mapping Tests Parameters for All sections_21_5_2020 F)

Product/Material (select one from list) *	Specific Product/Material (select one from list, if others specify) *	Specific Test (select multiple from list)*	Acceptable level requirement by client (not mandatory)
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Sample Name: *	Date of Sample collection: *	Location of Sample collected: *
Batch No:	Manufacture date: *	Purpose: *(List box Annex 3.)
Sample Transport Condition: * (list box Annex 4.)	Sample Quantity: * [Check box] (250 gram or 0.5 liters for each test).	

Add more	Submit
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*** Generate unique Sample Reference/registration No. (format: **NFTL/YEAR/SERIAL No.**) [Only one reference number will be generated per submission. Under one submission you can request(add) several products test.] If acceptable requirement is specified by client, then the range should be displayed in Technicians interface.

3.2.2 Seek Interpretation.

Type FTL code	Section	Seek Interpretation
FTL/XXXX/1	List all the sections which has tested for FTL/XXXX/1 (multi select)	(Text box)

Submit

***upon submit button the request should go to respective section lab officer or lab in-charge who ever analyzed that report.

3.2.3 Test Report.

Test Report Format

ལོ་ནམ་དང་ནགས་ཚལ་ལྷན་ཁག།
འབྲུག་ལོ་ནམ་དང་ཟ་ཆས་ཁྲིམས་དྲིན་དབང་འཛིན་
རྒྱལ་ཡོངས་ཟ་ཆས་བརྟག་དཔྱད་ཁང།

Royal Government of Bhutan
Ministry of Agriculture and Forests
Bhutan Agriculture and Food Regulatory Authority (BAFRA)
National Food Testing Laboratory



T-2383

NFTL/YEAR/SERIAL No:

Date:

Test Report

Name and Address of the Client

Client Reference No.

Type and Nature/Name of the Product:

Description of the product:

Date of collection:

Date of Receipt:

Date of Start of Analysis:

Date of Completion:

Date of Reporting:

Condition of sample upon receipt

Sampled By:

Test Result:

S.No	Parameter tested for	Unit of measurement	Result	Range of Testing/LOQ	Acceptable Level	Analytical Method
FTL/XXXX/1						
Chemical						
Biological						
Micro Biological						
FTL/XXXX/2						
Chemical						
Biological						
Micro Biological						

- The test results relate only to the particular samples submitted for Testing as per the test method referred above
- This Test Report shall not be reproduced except in full, without approval from the issuing authority
- The test results are based on the sample received
- The test marked with an # are not under scope of NABL

Analyzed By:

Analyzed By:

Analyzed By:

Authorized By:

(Name and Seal)

(Name and Seal)

(Name and Seal)

(Name and Seal)

Chemical *** Biological Micro Biological

Officer In-charge, NFTL

*** Chemical consist of Contaminant, Residue and Nutrition Section (if the result consists of all three or more than one section, then contaminant lab in-charge's name and seal should appear on "Analyzed By" under Chemical. Else individual lab in-charge of respective test should appear under Chemical.

Note: This is system generated test result, the organization requiring this result should confirm the authenticity by verifying the NFTL and FTL code from the website www.XXXXXX.gov.bt

3.3 Sample Manager.

3.3.1 Test Request received

Dashboard to display all the test requested by client based on Sample Reference/registration No

Sl. No	Sample Reference/registration No	Requested Date
1	NFTL/2020/XXXX	Date
2	NFTL/2020/XXXX	Date
3	NFTL/2020/XXXX	Date
.....

Upon clicking on the Sample Reference/registration No following details should be displayed.

NFTL/2020/XXXX Details:

Specific Product/ Material	Specific Test	Forward / Reject	FTL Number (generate unique number if forward is selected)	Remarks (reason for rejection)
	<i>(List tests selected during Sample Registration) Example:</i>	<i>Choose forward or Reject for specific test (list box)</i>	<i>FTL/XXXX/1 (All tests under Product X will have same FTL code)</i>	<i>No need of remarks if forwarded</i>
Infant milk food/ Infant formulae/ Infant milk substitute	a) Total plate count	forward	FTL/XXXX/1	
	b) Coliform count	forward	FTL/XXXX/1	
	c) Yeast count	forward	FTL/XXXX/1	
	d) Mould count	Reject (if rejected remarks column should be filled)	If reject no FTL	Give remarks If rejected
	e)			
	f)			
	g)			
Product y	a)..... b)..... c).....	Choose forward or Reject.	FTL/XXXX/2	Give remarks If rejected

- 1) If forward is selected Generate FTL code, “Product X” with several test will have same FTL code. Further the test should be forwarded to respective Sections (Labs) in-charges based on the mapping in Annex 2.
- 2) If rejected the remarks should be forwarded to client by system.

3.3.2 Test result received/status

Interface to display all the test results received from respective labs/sections based on Sample Reference/registration No

Sl. No	Sample Reference/registration No	Status
1	NFTL/2020/XXXX	Completed
2	NFTL/2020/XXXX	Pending
3	NFTL/2020/XXXX	Pending
.....

Upon clicking on the Sample Reference/registration No. following details should be displayed.

NFTL/2020/XXXX Details:

FTL Number	Specific test	Result/status
FTL/XXXX/1	Example: Total plate count	Completed
	Coliform count	Completed
	Yeast count	Completed
	Mould count	Completed
FTL/XXXX/2	.....	Completed
	.....	Pending at
	.....	Pending at
FTL/XXXX/2	.....	Completed
	.....	Completed
	.....	Pending at

Forward to (list those who have endorsement)	Forward
--	---------

privilege)	
------------	--

*** upon completing all the tests requested by client “Forward to” and “forward button” should be enabled so that the sample manager can forward the report to Endorse Test (Signing Authority).

3.4 Lab In-charge and Lab officer of respective section’s interface

3.4.1 Assign Test

Interface to display all the **test requested** based on FTL Number.

FTL Number	Specific Test	Assign to	Action
FTL/XXXX/1	Auto (based on Specific Test selected during sample registration by client and forwarded by sample manager)	Choose from the List of technicians (only those technicians under respective section will be displayed)	Assign(button)
FTL/XXXX/2	Auto	Choose from the List of technicians	Assign (button)
FTL/XXXX/3	Auto	Choose from the List of technicians	Assign (button)
.....

***Lab in-charge will be able to assigning test to “Self”

*** Lab officer will have same interface as Lab in-charge except Assign Test

3.4.2 Self Assigned Test

Interface to display all the **test Assigned** to self, based on FTL Number.

FTL Number	Specific Test	Received Date
FTL/XXXX/1	Auto (based on Specific Test selected during sample registration by client, forwarded by sample manager and assigned by labin-charge)	Date
FTL/XXXX/2	Auto	Date
FTL/XXXX/3	Auto	Date

Upon clicking on the FTL Number following details should be displayed.

FTL/XXXX/1 Details:

Product/ Material of Test	Specific Test performed	LOQ	Analytical method	Acceptable level	Result
Ex. Apple juice	Auto (based on Specific Test selected during sample registration by client, forwarded by sample manager and assigned by lab in-charge)	Auto Fetch (based on mapping in Annex 2)	Auto Fetch (based on mapping in Annex 2)	(Auto Fetch) if requirement is specified by client then that requirement has to be displayed else display based on mapping in Annex 2)	Input test result
.....

Assign analyst: *select (list all lab in-charge and Lab officer whom the role is assigned while creating user)	Submit (button)
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*** Reference for analyst assignment:

- a) For Microbiology Lab:
 1. Lab Technician for Microbiology can assign 1) Lab officer of microbiology, 2) Lab in-charge of Microbiology and Lab in-charge of Biotechnology as analyst.
 2. Lab officer of Microbiology can assign lab in-charge of Microbiology and Biotechnology.
 3. Lab in-charge of Microbiology can assign Lab officer of Microbiology and lab in-charge Biotechnology.

- b) For Biotechnology
 1. Lab Technician for Biotechnology can assign 1) Lab officer of Biotechnology, 2) Lab in-charge of Biotechnology and Lab in-charge of Microbiology as analyst.
 2. Lab officer of Biotechnology can assign lab in-charge of Microbiology and Biotechnology.
 3. Lab in-charge of Biotechnology can assign Lab officer of Biotechnology and lab in-charge Microbiology.

- c) For Nutrition

1. Lab Technician for Nutrition can assign 1) Lab officer of Nutrition, 2) Lab in-charge of Nutrition, Contaminant and Residue as analyst.
 2. Lab officer of Nutrition can assign lab in-charge of Nutrition, Contaminant and Residue as analyst.
 3. Lab in-charge of Nutrition can assign Lab officer of Nutrition, lab in-charge Contaminant and Residue as analyst.
- d) For Contaminant
1. Lab Technician for Contaminant can assign 1) Lab officer of Contaminant, 2) Lab in-charge of Nutrition, Contaminant and Residue as analyst.
 2. Lab officer of Contaminant can assign lab in-charge of Nutrition, Contaminant and Residue as analyst.
 3. Lab in-charge of Contaminant can assign Lab officer of Contaminant, lab in-charge Nutrition and Residue as analyst.
- e) For Residue
1. Lab Technician for Residue can assign 1) Lab officer of Residue, 2) Lab in-charge of Nutrition, Contaminant and Residue as analyst.
 2. Lab officer of Residue can assign lab in-charge of Nutrition, Contaminant and Residue as analyst.
 3. Lab in-charge of Residue can assign Lab officer of Residue, lab in-charge Nutrition and Contaminant as analyst.

3.4.3 Analyze Test.

Interface to display all the **test analysis** requested based on FTL Number.

FTL Number	Specific Test performed	Result	Action	Remarks
FTL/XXXX/1	Auto (based on Specific Test selected during sample registration by client, forwarded by sample manager and assigned by lab in-charge)	Test results	Approved /rejected	If reject remark column should be enabled
FTL/XXXX/2	Auto (based on Specific Test selected during sample registration by client, forwarded by sample manager	Test results		

	and assigned by lab in-charge)			
FTL/XXXX/3	Auto (based on Specific Test selected during sample registration by client, forwarded by sample manager and assigned by lab in-charge)	Test results		
.....

***Interface where lab In-charge and Lab officer can verify technicians test result and other lab in-charges and Lab officers test. If approved the result should be forwarded to sample manager and if rejected the test should be returned to the technician/lab officer/lab in-charge who conducted the test with remarks.

3.4.4 Provide Test Interpretation.

The following will be displayed on selected lab officer or Lab In-charges interface

FTL Number	Result
FTL/XXXX/1	Auto
FTL/XXXY/5	Auto
FTL/XXYY/1	Auto
.....

Upon clicking on the FTL Number following details should be displayed.

FTL/XXXX/1 Details:

Product/ Material of Test	Specific Test performed	LOQ	Analytical method	Acceptable level	Result	Interpretation
Products of fruit and vegetable	Auto ((based on interpretation requested by the client)	Auto Fetch (based on mapping in Annex 2)	Auto Fetch (based on mapping in Annex 2)	Auto Fetch if requirement is specified by client then that requirement has to be displayed else display based on mapping in Annex 2)	Auto	Interpretation (Text box.)

.....
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While submitting the interpretation, system should send the interpretation to client's dashboard.

3.4.5 stock usage

Name of Chemical and reagent (list box, based on master inventory)*	Unit (auto upon selecting the chemical and reagent)*	Lot No. (list box)*	Quantity Available (auto upon selection of Lot No.)*	Quantity Used (text box)*
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3.5 Technicians Interface

3.5.1 Conduct Test

Interface to display all the **test Assigned** by Lab in-charge based on FTL Number.

FTL Number	Specific Test	Received Date
FTL/XXXX/1	Auto (based on Specific Test selected during sample registration by client, forwarded by sample manager and assigned by lab-in-charge)	Date
FTL/XXXX/2	Auto	Date
FTL/XXXX/3	Auto	Date

Upon clicking on the FTL Number following details should be displayed.

FTL/XXXX/1 Details:

Product/ Material of Test	Specific Test performed	LOQ	Analytical method	Acceptable level	Result
Ex. Apple juice	Auto (based on Specific Test selected during sample registration by client, forwarded by sample manager and	Auto Fetch (based on mapping in Annex 2)	Auto Fetch (based on mapping in Annex 2)	Auto Fetch if requirement is specified by client then that requirement has to be displayed else display	Input test result

	assigned by lab in-charge)			based on mapping in Annex 2)	
.....

Choose from the list of analysts(see reference in lab officer and Lab in-charge interface)	Submit (button)
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3.5.2 Test rejected by verifier

FTL Number	Specific Test	Received Date	Remarks
FTL/XXXX/19	Auto (based on Specific Test rejected by lab in-charge)	Date	Remarks from lab in-charge
FTL/XXXX/29	Auto	Date	
FTL/XXXX/52	Auto	Date	

Upon clicking on the FTL Number following details should be displayed.

FTL/XXXX/1 Details:

Product/ Material of Test	Specific Test performed	LOQ	Analytical method	Acceptable level	Result
Ex. Apple juice	Auto (based on Specific Test selected during sample registration by client, forwarded by sample manager and assigned by lab in-charge)	Auto Fetch (based on mapping in Annex 2)	Auto Fetch (based on mapping in Annex 2)	Auto Fetch if requirement is specified by client then that requirement has to be displayed else display based on mapping in Annex 2)	Re-test based on remarks and Input test result
.....

Re-submit

	Y	Fetch(based on mapping in Annex 2. example) a)... b)... c)....	Fetch(based on mapping in Annex 2)	Fetch(based on mapping in Annex 2)	Fetch if requirement is specified by client then that requirement has to be displayed else display based on mapping in Annex 2)		(only one endorse button per FTL)
	

*** upon endorsement, the information has to be updated under Sample managers interface, lab In-charges interface and client interface via report.

3.7. Store In-charge Interface.

3.7.1. Stock Entry.

Name of Chemical and reagent (list box, based on master inventory)	Unit (auto upon selecting the chemical and reagent)	Quantity (text box)
Lot No. (text box)	Expiry date(date)	

submit

3.7.2 Stock balance.

The store in-charge should be able to filter by following to check the stock balance

- Name of Chemical and reagent:
- Lot No:
- Expiry date:

4. Reports

- a) Client: Track status, test result and interpretation report.
- b) Sample Manager: Sample registration/reference no. wise and interpretation report
- c) Lab In-charge: Only related to his/her section, FTL Number wise test, technician wise test, interpretation report, stock usage, and stock balance.
- d) Lab officer: FTL wise (only his/her tests and analysis), stock usage, stock balance
- d) Technician: FTL wise (only his/her tests), stock usage, stock balance.
- e) Officer in-charge (Overall report) Reports Filtered by
 - Section wise
 - Product/Material wise
 - Specific Product/Material
 - Specific Test wise
 - Purpose wise
 - Client wise
 - Dzongkhag wise
 - Gewog wise
 - Sample registration/reference no. wise
 - FTL number wise
 - Technician wise.
 - Date “FROM” and “TO”
- f) Store In-charge: Stock entry, usage and balance under respective labs.

*** Print / export file in excels, word and pdf. And based on the result after filter there should be an option to view the report visually (graphical report) {regarding what kind of graph i.e. line graphs, bar graphs and histograms, pie charts, and Cartesian graphs, etc. Statistic Specialist are working on it and will be provided to the consultant before 2 demo}

5. Master Data Management

5.1. Inventory

Name of Chemical (text box)	Unit (text box)
-----------------------------	-----------------

Add

5.2 Client type

Add client type: (text box)

5.3 Purpose

Add Purpose: (text box)

5.4 Sample transport condition

Add Sample transport condition: (text box)

5.5 Product, test and Section mapping.

Add

- 1) Product/Material
- 2) Specific Product/Material
- 3) Specific Test
- 4) Acceptable level
- 5) Range of Testing/LOQ
- 6) Analytical Method
- 7) Section(Labs)

6. User Management

6.1 NFTL user management

Name:

EID:

User Type:(list all user type [Sample manager / Lab in-charge/ Lab officer/ labTechnician / store in-charge])*** If Lab in-charge/ Lab officer/ Lab Technician is selected then the section (Lab) field should be enabled. Further if Lab in-charge or Lab officer is selected, roles field should be enabled.

Section: (list all section [contaminant / residue / nutrition /Biotechnology / microbiology])

Roles: Multiple selection: a) Analyze Test b) Endorse Test (Signing Authority) c)Officer in-charge (Overall report).

E-mail id: (Text Box)

Phone number: (Text Box)

Password: (password)

Create User: (Button)

6.2 Client user management

- Interface to accept or reject client registration.

Annex 1. Client Type

- Royal
- Diplomat
- Regulatory
- Business entity/Cooperatives
- Others* (specify)

Annex 2. Mapping of Test with product, section, acceptable level, analytical method and LOQ (attached separately)

Annex 3. Purpose

- Regulatory
- Export/import
- Surveillance
- Event reporting/complaint
- Research
- Others*(specify)

If others text box to specify so that later it can be added to list through master data management.

Annex 4. Sample Transport Condition

- Room temperature
- Refrigerated
- Frozen

Annex 5. Organogram of NFTL.

