C3 C4 D2 – Lab Investigation to reports process

OR Sample already taken by doctor in physical episode (check box)

Member Issued Lab Investigation document

Member given action bucket tickets for QR check in and authorise at given clinic for collection

Member uses QR Check in at clinic

Registers in physical waiting room using existing episode

Member uses QR Authorize with doctor

QR Check in could be skipped

Doctor views existing episode with Lab request

Update collection doctor and time/date (& notes?)

Doctor downloads Lab request form

For sending together with sample collection to lab

Lab Investigation report is completed and uploaded to FEV3R application

Lab sends report to centralised email address. NRIC or Passport & FEV3R episode number referenced on file. Email is sent to doctor that order lab in episode

Doctor Open episode updated with existing episode lab report

Both open and closed episodes are made available. Doctor views lab document and acknowledges

Notification sent to member for lab document availability in dashboard

Member can use notification to link to view lab document in container

IMPORTANT NOTE: Lab Reports can be uploaded manually without linked episode. See below sections

C3 C4 D2 – Admin Console: Lab Management and Setup

The admin console should have 2 screens (use a submenu for the 2 screens):

1. **Lab Management: Search, View and update Lab document workflow (first Section beginning this slide)**
2. Lab Setup: Setup test types and sample collection types with link to available labs (second section)

Lab Management will provide the ability to search for any issued or uploaded Lab documents that can be found in the users Lab Reports document container (from the mobile dashboard). As members will not be able to delete documents issued or uploaded via this functionality (it would be considered a FEV3R generated document), the lab management page will also all the admin user to move the status of the Lab document to DELETE (see next page for statuses).

Note that it is possible for the same Episode to have multiple Lab request documents generated. Each one of these requests would be a separate row in the Lab Management page. Note: There will be a new document area called Lab Reports in the episode (you can see this design in the wireframes document of section C4). This will contain all the lab reports received. If indeed a doctor did order multiple lab investigations, or the lab sent back multiple reports, there would still only be one sample collection and collection doctor for those multiple investigations and/or reports received. If duplicates are received via the email we can overwrite the previous file in the document container/epsiode (resend the email to the doctor with replacement file) and write to logs

The top of the page has a search function with the following fields: Member ID, Member Name, Lab Order ID, Lab name (associated to the organisation providing the report), Under Subscription, Clinic name (associated to the collection Clinic), Date range (Lab Document issue or upload date) – mandatory field, Status (Issued, Collection, Await Results, Result Recd, Result Viewed, Manual 1, Manual 2, Deleted), Test Type (box with multiple selections of test type), Sample Type (box with multiple selections of sample type), Episode No (also referred to as the "internal reference"), NRIC/Passport, Sample collection date/time

The output should be sorted by date (Lab document issue or upload date). The output can also be extracted to a spreadsheet in tabular form (XLS)

An upload button is available for manually uploaded lab documents. The admin user will either select a specific lab order id to link the uploaded document to or will create a new Lab Order ID which the lab document will be linked to (See status "Manual 1" or "Manual 2")

The Lab Order ID ref is generated each time a Lab test is issued, or document manually uploaded by an admin user for a member:

a. The doctor generates/uploads a lab investigation document in the episode
b. A lab report is manually uploaded to the member without an associated episode (via admin console)

C3 C4 D2 – Admin Console: Lab Management

The output of the listing of Lab Orders would look like the following:

Member ID	Member Name	Lab Date	Lab Order ID	Under Subscription	Lab Report Status	Collection Clinic	Collection Doctor	Lab Company	Test Type	Sample Type	Episode No	Ordering Clinic	Ordering Doctor	NRIC / Passport	DOB	Gender	Mobile	Sample Date	Match Filename	View Lab Request document
Cust_ Member table ID linked to Lab investigation	Member Name linked to Lab investigation	Date (Lab Document issue or upload date)	Unique ID of the Lab order	Based on checkbox in test profile setup (not all test profiles may have checkbox – leave blank or "No" if so)	Status of the Lab Document (Issued, Collection, Await Results, Result Recd, Result Viewed, Manual1, Manual2, Delete)	Healthcare Network ID (Healthcare Org) associated to the Lab request document (Collection Clinic)	Doctor performing collection as per lab request document. Cust_Member table ID and name for Member Type = Healthcare Worker	Healthcare Network ID (Lab Services) associated to the Lab request document (Lab test services company)	Tests that were ordered by the doctor in the Lab request document – should be multiple tag "boxes"	Samples that were ordered by the doctor in the Lab request document (associated to the tests) – should be multiple tag "boxes"	Episode Number linked to the Lab request	Healthcare Network ID (Healthcare Org) associated to the doctor who ordered the Lab request document (Episode Clinic)	Doctor who originally ordered lab request document. Cust_Member table ID and name for Member Type = Healthcare Worker	NRIC or Passport of member linked to lab request	Mobile Number of Member	Gender of Member	Mobile Number of Member	Date of Sample (Lab sample collect date – blank until collection taken)	File name used in matching process from Lab document received	Link to view the Lab Request form (with download icon)
1234	Gerald Holland	12 Mar 22	LAB0000 01222	Yes	Result Recd	FEV3R Clinic	1324 Dr Adele Holland	GRIBBLES	Full Blood	Blood	EP00000 1233	FEV3R Clinic	1324 Dr Adele Holland	1234356 1122	01 Dec 1988	Male	+601777 78899	12 Mar 22	1234356 1122_EP 0000012 33	Link
2233	Tim Rope	12 Mar 22	LAB0000 01223	Yes	Results Viewed	XYZ Clinic	1445 Dr Tony Stark	ABC Lab	Infectious	Blood, Urine	EP00000 1234	XYZ Clinic	1445 Dr Tony Stark	4434356 1125	17 Aug 1973	Male	+601777 72233	12 Mar 22	4434356 1125_EP 0000012 34	Link
2233	Tim Rope	15 Mar 22	LAB0000 01245	Yes	Deleted	FEV3R Clinic	1324 Dr Adele Holland	GRIBBLES	Full Blood, White cell, Dengue	Blood, Urine	EP00000 1235	FEV3R Clinic	1324 Dr Adele Holland	4434356 1125	17 Aug 1973	Male	+601777 72233	15 Mar 22	4434356 1125_EP 0000012 35	Link
1445	Amanda Collin	18 Mar 22	LAB0000 01350	Yes	Manual2	FEV3R Clinic	1324 Dr Adele Holland	GRIBBLES	Full Blood	Blood	EP00000 1236	FEV3R Clinic	1324 Dr Adele Holland	1234356 1128	29 Mar 2002	Female	+601777 74455	18 Mar 22	1234356 1128_EP 0000012 36	Link
1234	Gerald Holland	19 Mar 22	LAB0000 01387	Yes	Collection	XYZ Clinic	1445 Dr Tony Stark	ABC Lab	Full Blood, Dengue	Blood, Urine	EP00000 1237	XYZ Clinic	1445 Dr Tony Stark	1234356 1122	01 Dec 1988	Male	+601777 78899	19 Mar 22	1234356 1122_EP 0000012 37	Link
2233	Tim Rope	19 Mar 22	LAB0000 01398	Yes	Issued	FEV3R Clinic	1324 Dr Adele Holland	GRIBBLES	Full Blood	Blood, Urine	EP00000 1238	FEV3R Clinic	1324 Dr Adele Holland	4434356 1125	17 Aug 1973	Male	+601777 72233	19 Mar 22	4434356 1125_EP 0000012 38	Link

There are 2 active links on the table which will bring up a popup (other than the upload button described on the previous page):
1. Lab Report status: Pop up associated to changing the status, Lab test company, Collection doctor & Clinic, Sample Date, Match File name
2. Link to preview the lab request document generated from the episode

C3 C4 D2 – Admin Console: Lab Management

Selecting "Lab Management" sub menu will display this page:

Pressing the upload button will bring up the popup described in "**Lab Management new popup for upload**"

Selecting Search button displays results below

There are lots of columns by default. The user has the ability to remove columns by selecting the "checkbox" corresponding to the fields that they want to be shown (and downloaded to XLS). Note that the last column for "View Lab request Doc" remains always in the view for the user – other fields will scroll horizontally.

Scroll bar to move horizontally

The download CSV button will output a XLS file based on the fields selected – based on all records found in search

Pressing the Link in the Lab Report Status column will bring up the popup described in "**Lab Management new popup on Status**"

C3 C4 D2 – Admin Console: Lab Management new popup on Status

Manually handle Lab Report   Lab Order No **LAB000001398**

Member Information

Member Name
Tim Rope

Member NRIC
44343561125

The member information on this popup are non-editable

Member Mobile
+60177772233

Lab Order Information

Lab Status
Issued

Lab Company
GRIBBLES

Collection Doctor
1324 Dr Adele Holland

Collection Clinic
XYZ Clinic

Sample Date
19 Mar 22

Match File Name
44343561125_EP000001238

Comments   See Comment History

Comment Box If The Admin User Amends Data

Cancel   Upload   Confirm

The record is available from the Status field on the Lab Management main screen. The record is for viewing Lab Report status associated to changing the status, Lab test company, Collection doctor & Clinic, Sample Date, Match File name. An admin user should have selected a checkbox corresponding to a specific Lab Order ID

1. Lab Status: See next slide associated to definition of Lab statuses. The following rules apply: a. Not possible to change status to Issued as must originate from new episode (show error); b. Await Results can only be preceded by Issued or Collection (show error); c. Result Viewed can only be preceded by Result Recd (as there are trigger events on Result Recd; d. Manual2 is not available when moving from/to other status (separate popup must be used but can amend information for Manual2); e. When using manual upload button to load file from admin users drive, MANUAL1 must be used

2. Lab Company: Healthcare Network ID (Lab Services) associated to the Lab request document (Lab test services company) – mandatory for MANUAL1, Await Result, Result Recd, Result Viewed

3. Collection Doctor: Doctor performing collection as per lab request document. Cust_Member table ID and name for Member Type = Healthcare Worker – mandatory for MANUAL1, Await Result, Result Recd, Result Viewed

4. Collection Clinic: Healthcare Network ID (Healthcare Org) associated to the Lab request document (Collection Clinic) – mandatory for MANUAL1, Await Result, Result Recd, Result Viewed

5. Sample Date: Date of Sample (Lab sample collect date – blank until collection taken) – mandatory for MANUAL1, Await Result, Result Recd, Result Viewed

6. Match Filename: File name that was used for matching (already matched), or admin user can enter file name for automatic matching from centralized Lab document location, or file name if admin user is using manual upload button to load file from admin users drive – mandatory for MANUAL1, Result Recd, Result Viewed

A link (either as popup or extends the existing popup) should be available to view previous changes to the order status and the associated comment with the name of the admin person who made those changes.

Where the fields are edited by the admin user, they must enter comments before confirming the change in the record. Any changes require confirmation or can be cancelled which returns the data of this popup back to original state

The admin user can select to upload a lab file from their local drive rather than selecting from centralized file location (only available for MANUAL1). File types could be word, excel, pdf and image files

C3 C4 D2 – Admin Console: Lab Management new popup for upload

Selection of member is based on NRIC, Passport, member number or member name – search dropdown will show member ID and Full name

Manually handle Lab Report

Lab Order No **LAB000001398**

Lab Order No is auto generated when a new popup is opened

Member Information

Member Name

Tim Rope

Member NRIC

44343561125

This field is defaulted from member Not editable

Member Mobile

+60177772233

This field is defaulted from member Not editable

Lab Order Information

Lab Status

Issued

Lab Company

GRIBBLES

Collection Doctor

1324 Dr Adele Holland

Collection Clinic

XYZ Clinic

Sample Date

19 Mar 22

Match File Name

44343561125_EP000001238

Comments

See Comment History

Comment Box If The Admin User Amends Data

Cancel   Upload   Confirm

The record is available from the New Upload button on the Lab Management main screen. It is primarily used for creating a new Lab Order ID where no episode exists to link it to and only Manual2 status can be used. The record will have a new Lab Order No created and the member number or name is mandatory to start

1. Lab Status: Defaulted to MANUAL2. Cannot be changed on this screen
2. Lab Company: Healthcare Network ID (Lab Services) associated to the Lab request document (Lab test services company) – mandatory
3. Collection Doctor: Doctor performing collection as per lab request document. Cust_Member table ID and name for Member Type = Healthcare Worker – Not mandatory
4. Collection Clinic: Healthcare Network ID (Healthcare Org) associated to the Lab request document (Collection Clinic) – Not mandatory
5. Sample Date: Date of Sample (Lab sample collect date – blank until collection taken) – Not mandatory
6. Match Filename: File name if admin user is using manual upload button to load file from admin users drive – auto populated after upload of file

A link (either as popup or extends the existing popup) should be available to view previous changes to the order status and the associated comment with the name of the admin person who made those changes.

Where the fields are edited by the admin user, they must enter comments before confirming the change in the record. Any changes require confirmation or can be cancelled which returns the data of this popup back to original state
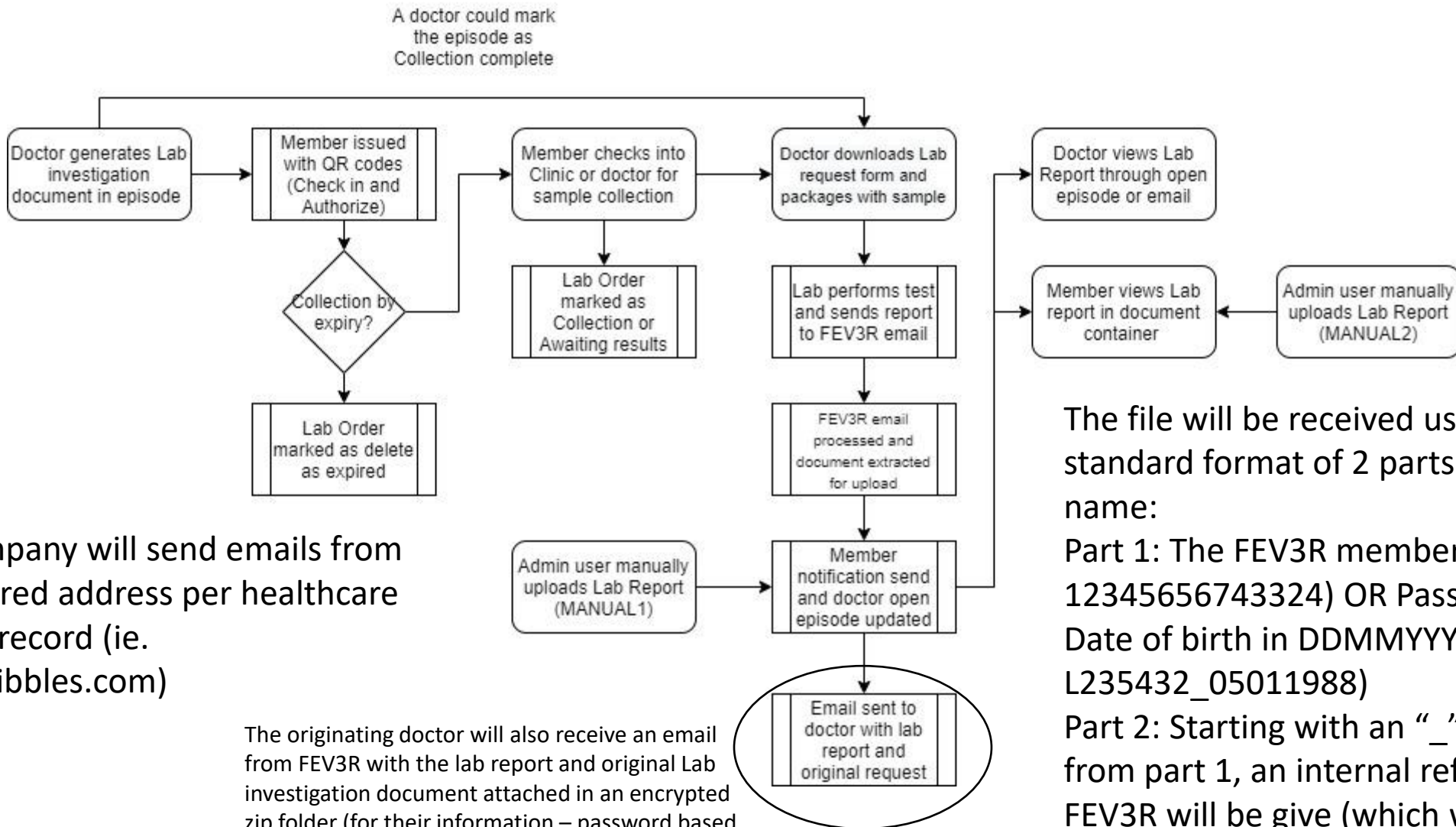
The admin user can select to upload a lab file from their local drive rather than selecting from centralized file location. File types could be word, excel, pdf and image files

C3 C4 D2 – Admin Console: Lab Management Statuses

The Lab order status field has 8 categories:

1. Issued: Lab request issued by doctor in episode. Status cannot be used in manual upload as must originate from Lab request in Episode
2. Collection: Status reserved when member uses QR Check in at Clinic for sample collection. Note that this status can be skipped if the member uses QR Authorize directly with the doctor taking sample
3. Await Results: Doctor has taken the sample from the member – triggered by either the member selecting QR Authorize AND/OR the doctor accessing the episode to mark collection taken/print request form. Member Selecting QR authorize will automatically link to the episode record and update doctor name with sample collection date in episode record (nothing for doctor to add – just download request form). It is possible for an admin user to move directly to this status by entering doctor name & sample collection information manually (this will also update the associated episode information automatically)
4. Result Recd: Lab result document is successfully processed via email from lab test company. Lab result pdf is successfully uploaded to member in Lab Report document container. This status triggers a notification to the member that a Lab document has been received in their Lab Report document container. The episode which originated the lab investigation will be available/triggered for the doctor in the open episode's box of doctor dashboard (See Result Viewed). The originating doctor will also receive an email from FEV3R with the lab report and original Lab investigation document attached in an encrypted zip folder (for their information – password based on doctor licence number).
5. Result Viewed: Results are viewed by a doctor by opening document in episode (after selecting to view from the open episode container on the doctor dashboard)
6. Delete: Used for decommissioning Lab order ID. Used primarily where the doctor has ordered a Lab investigation, but the member has not attended sample collection at clinic within expiry timeline from action bucket ticket (ie. QR check in and authorize related). Can also be used for Admin user to interrupt or terminate process in Lab Result collection (ie. Operational instruction from doctor/member to cancel, correction to invalid issuance of lab request, or correction to previously uploaded Lab document). The Delete status will automatically cancel any outstanding action bucket for the member (in the case of Issued or Collection Status) or will delete a Lab Report document that was previously uploaded to the Members' Lab document container
7. Manual1: Manual Entry of Lab Order where the Lab Report is uploaded. This status is used where the Lab Report is received from the Lab Company (via email to centralized file location), but the file name is not recognized by auto trigger. This status can only be used if there is an existing Lab Order ID in the Lab Management console and the popup on status linked to that row is used. Just as with Result Recd status, a notification to the member that a Lab document has been received in their Lab Report document container, and to the open episode of a doctor to view the document in episode. The originating doctor will also receive an email from FEV3R with the lab report and original Lab investigation document attached in an encrypted zip folder (for their information – password based on doctor license number). After selecting MANUAL1, it is possible for the FEV3R application to move the status to Result Viewed (just as with Result Recd)
8. Manual2: Manual Entry of Lab Order where the Lab Report is uploaded without any link to episode or lab request from doctor. This status is used where a Lab document is received from Lab company but no valid episode or lab request exists in the FEV3R application. A member and basic information on the lab document is confirmed in popup for upload. The document could be uploaded from admin users drive or triggered from centralized location with matching file name. This status will trigger a notification to a member (that the Lab document is available in Lab Report document container, but not trigger the open episode to the doctor)

C3 C4 D2 – Admin Console: Lab Management Statuses flow

A doctor could mark the episode as Collection complete

Doctor generates Lab investigation document in episode → Member issued with QR codes (Check in and Authorize) → Member checks into Clinic or doctor for sample collection → Doctor downloads Lab request form and packages with sample → Doctor views Lab Report through open episode or email

Collection by expiry?

Lab Order marked as Collection or Awaiting results

Lab Order marked as delete as expired

Lab performs test and sends report to FEV3R email

FEV3R email processed and document extracted for upload

Member views Lab report in document container ← Admin user manually uploads Lab Report (MANUAL2)

Admin user manually uploads Lab Report (MANUAL1) → Member notification send and doctor open episode updated

Email sent to doctor with lab report and original request

The lab company will send emails from one configured address per healthcare network ID record (ie. reports@gribbles.com)

The originating doctor will also receive an email from FEV3R with the lab report and original Lab investigation document attached in an encrypted zip folder (for their information – password based on doctor licence number – stored in Healthworker table for doctor and currently displayed on doctor dashboard).

The file will be received using a standard format of 2 parts to the file name:
Part 1: The FEV3R member NRIC (ie. 12345656743324) OR Passport plus Date of birth in DDMMYYYY format (ie. L235432_05011988)
Part 2: Starting with an "_" to separate from part 1, an internal reference to FEV3R will be give (which will be the episode ID)

# C3 C4 D2 – Admin Console: Lab Management Error handling

It is possible that the email received from the lab company successfully passes validation in terms of being from the correct sending email or domain and is sent to the correct fev3r receiving email (see lab setup), yet still fails as there is a problem with the attachment or filename of the attachment.

The admin user needs to be able to see that there are rejected files and the reason why that email/attachment failed processing. They need to have a way to safely locate and access/download the file for investigation, then return the file for re-try of processing. Any solution provided should not assume that the user has more than basic technical knowledge (ie. It will be an operations user with no real technical/developer knowledge).

Examples could be:

1. The file name (ie. Internal FEV3R reference or NRIC) has not been correctly captured by the lab company from the form sent by our doctor. The resolution would be for the admin user to open the attachment, investigate and correct the file name for processing (ie. Post back to the storage location with a trigger to re-try the posting of the lab report (to achieve Report Recd status)
2. The attachments in the email are corrupt. The resolution would be for the admin user to investigate and fix the corruption which may involve requesting the lab to re-send the file via email

C3 C4 D2 – Admin Console: Lab Management Error handling
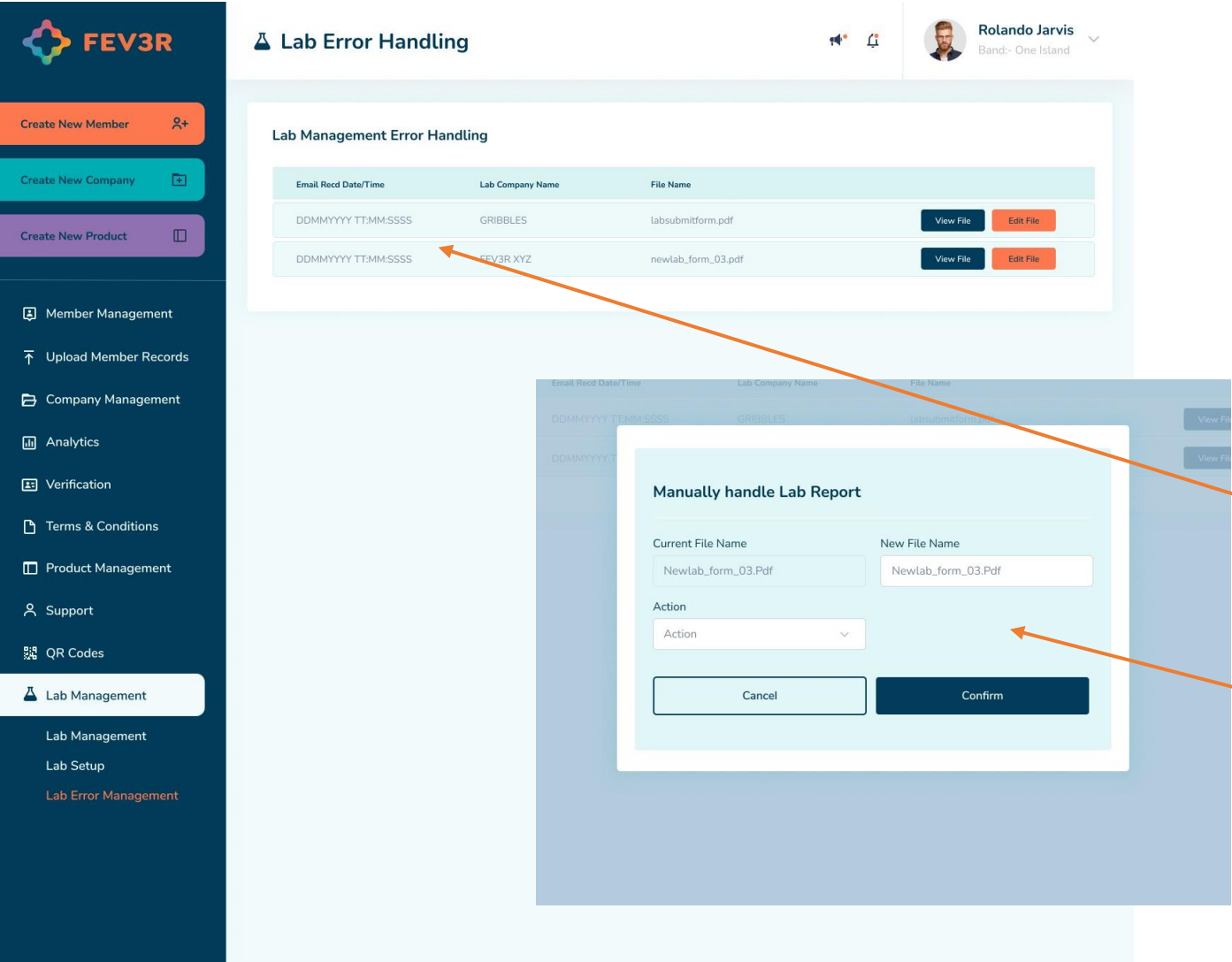
New screen to show the files that have been received on a valid email (sender and receiving email correct) but the file name was unable to be processed for the reasons mentioned above. This screen would have the ability to view the file received, change the file name after viewing, or mark as inaccurate (take no action). Note that where the user marks the file received as inaccurate, that admin user would operationally (manually) request the lab company to resend the lab document or investigate with the lab company based on email received date/time.

Where there are multiple file received from the lab company email, each of the valid file PDF attachments would be a row (ie. If there is 2 PDF attachments, this would be 2 rows shown in the new screen)

The screen would have the following fields:
Email recd date/time (DDMMYYYY TT:MM:SSSS; Lab company Name (based on the sending email); File name (on PDF file recd); View file (button with PDF viewer screen); Edit (button to bring up popup)

New popup on pressing edit button would have the following fields: Current file name (non editable); New file name (defaulted with current file name); Action (action to take dropdown list – resubmit for processing; take no action); save and cancel buttons at bottom of popup

C3 C4 D2 – Admin Console: Lab Setup

The admin console should have 2 screens (use a submenu for the 2 screens):
1. Lab Management: Search, View and update Lab document workflow (last slides)
2. **Lab Setup: Setup test types and sample collection types with link to available labs (this slide onwards)**

Lab Setup will provide the ability to do 4 things:
1. Create, update and delete Lab test types (the lab tests that doctors can order on the Lab investigation screen)
2. Create, update and delete Lab sample types (the collection sample types that doctors select on the Lab investigation screen)
3. Link Lab test types to one or more lab Services (ie. Healthcare network ID) and Lab sample types available for the given Lab test types
4. Setup Lab Services (ie. Healthcare network ID) configuration information in the way that they will send lab reports to the FEV3R application

There would be pre-requisite setup that would need to be done in the healthcare Network details section of Company management. The Lab companies are setup in the same way as Clinics using the Add New button.

The user will also need to add the address (together with Logo file) using the Edit Address button. The address and logo is used for the Lab investigation request output (the one that the doctor will download from the episode and attach with the sample taken). The Delivery info button will not be used for Lab Service company types

The type for the Lab Services Healthcare Network ID will be hardcoded to "Lab". The Weighting will work in the same way as it does for Clinic in C2 Referrals

Once this setup is available, test profile types and collection types can be linked to that Lab Services organisation

NOTE: It should not be possible to link doctors to Lab Service organizations. The user should be shown an error saying "Not allowed. This is a Lab Service Org"

C3 C4 D2 – Admin Console: Lab Setup

The boxes show the links between test types, collection types and lab companies

In order to delete a line, the user must first select the line using the checkbox – then press the trash icon. The trash icon should be disabled till the checkbox is selected

The Lab Management screen would require setting up in the following order:
1. Setup a Lab service Company
2. Setup collection types
3. Finally, setup Test types and link the Lab Service Company and collection types

Pressing Edit requires that the checkbox for one of the Test profile types are selected. The popup for this is shown on the next slide

Pressing + New Test Type will access the popup shown on the next screen

The user can mark the test as available under subscription. This is used in order that the doctor can see with a yellow dot when selecting lab tests under subscription (similar concept to prescriptions)

Selecting + New Collection Type or + Add Lab Company will add a new line as opposed to a popup

The Sending email and Receiving email addresses are associated to the expected Lab document from the lab company. The Sending email is the email address FEV3R expects the lab document to be received from (any other email address should result in a rejection and quarantine/logging of the email received). The sending email could be a full email address or just a domain (ie. report@gribbles.com or gribbles.com). Entering the domain would mean that any email from that domain is accepted. The Receiving email is the email address FEV3R expects the lab document to be sent to (any other email address should result in a rejection and quarantine/logging of the email received). Validation on this fields should check for valid emails/domain entry by the user.

The user can edit directly here rather than popup

C3 C4 D2 – Admin Console: Lab Setup

Add New Test Type

☑ **Available In Subscription**

Test Type

Full Blood

Collection Type

Collection Type ∨   Add

Blood ⊗   Urine ⊗

Available Lab Companies

Available Lab Companies ∨   Add

Gribbles ⊗   Clinipath ⊗

Cancel   Add

The popup from the lab Management screen will allow the user to link multiple collection types and Lab companies to the test profile type

The user can mark the test as available under subscription. This is used in order that the doctor can see with a yellow dot when selecting lab tests under subscription (similar concept to prescriptions)

Dropdown of the available Collection types that have been setup. Pressing "Add" will confirm the addition of the collection type selected

Dropdown of the available Lab service organisations that have been setup. Pressing "Add" will confirm the addition of the lab service company selected

Pressing Add will commit the changes made

A New test profile type should have at least 1 collection type and 1 Lab service organisation. An error message should say "At least 1 collection type or Lab is required" if the user tries to press Add without achieving this.