Feature Request / RFC

E-resept Forskrivningsmodul

Thula – Nordic Source Solutions

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1 Document control

This section describes how to version, file, distribute and improve this document.

1.1 Revision tracking

This document is subject to revision control so that after each formal change a new version shall be created with a new data and revision number. At any given time the revision with the highest version number is considered the official and valid version of this document.

1.2 Document source, storage and distribution

The source of this document is maintained by Thula, and stored in the Thula document repository. This document shall be distributed in PDF format only.

1.3 Revision history

Date	Version	Author/Approved by	Description
2020-01-24	1.1	Atli Sturluson	Reports are saved as XPS, not PDF
2019-11-21	1.0	Atli Sturluson	Status set to Approved
2019-11-21	0.6	Atli Sturluson	Selection of FM installation in login dialog
2019-11-13	0.5	Atli Sturluson	Updated after review
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2019-11-04	0.3	Atli Sturluson	Updated after review
2019-10-27	0.2	Atli Sturluson	Updated after review
2019-10-06	0.1	Atli Sturluson	Initial version

1.4 Related documents

The following documents are related

Document	Description

1.4.1.1 Reader comments

If you have any comments on the contents of this document please send those by e-mail to the author.

1.5 Glossary

Abbreviation	Explanation or web reference
RFC	Request for Change, aka feature request

Functional part

This part provides a functional description of the requested feature.

2 Functional Description

2.1 Overview

2.2 Customer Case

The new SFM prescription module now under construction will gradually replace FM over the next few years. Existing FM installations need to be ported to the new SFM environment which is centrally run and not locally in each organization as the FM is. A part of this move to SFM is that the existing data in the FM database will need to be ported to the SFM. The SFM will implement import functionality to import this FM data.

The FM export described in this document may also be used to transfer data from FM to other systems than SFM, if these have implemented a similar import function.

Security of the exported data is an important aspect. It is a requirement that no data shall be left un-encrypted in the filesystem after the export is finished. If the encryption is aborted, the process shall remove all files containing un-encrypted data. The encryption will be based on a public key from a selected certificate where only the receiver has access to the corresponding private key to decrypt the data. This also applies to any temporary files written during the export. All data should be written to a local disk, and not e.g. a mapped network drive. The security of the exported (encrypted) data is then the responsibility of the owning installation.

Kommentert [DH1]: Har vi tenkt på behovet for å kunne teste uten kryptering? Skal vi ha et "hemmelig flagg" i databasen?

2.3 Completion Criteria

This RFC should be considered complete when:

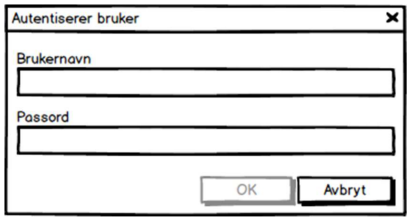
- An FM admin user can log in to the export application, entered the required parameters and start the export.
- The FM export application can only be run if the same version of the FM server is installed on the machine.
- The FM server is stopped before the export is started, and a warning message is shown if it is started while the export is executing.
- All patient related data, listed in section 2.4.2, is exported for all patients
- Other FM data, as listed in section 2.4.3, is exported
- The exported data is written to a selected local directory, formatted as described in section 2.4.5
- The exported data compressed and then encrypted using a selected certificate

2.4 Feature Description

2.4.1 The export application

The FM already includes export functionality as part of the FM Admin client, but this is mainly exporting treatment/prescription information and not all the data that is needed when porting from FM to another system.

The new export functionality will be implemented as a new application. This application will require the user to login using the same login dialog as the FM Admin client (only username/password available though, PIN code):



Only users that are registered as admins in FM will be allowed to log in.

Even if the FM Export is run as a stand-alone application and does not use the FM server, it will be released as a part of each FM release, using the same build number as the FM and can only be used with this same version of the FM server.

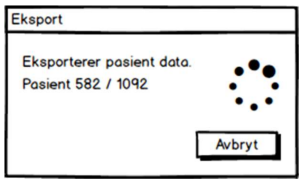
The application will have a simple UI for setting the required parameters and run the export, as shown below:

Here, the user may enter the following parameters:

- Output directory (required). This should be an existing, empty folder on the local machine. It should not be possible to select a directory on a network drive. If the folder does not exist or is not empty, an error message will be shown and the button for starting the export will be disabled.
- Select a certificate that will be used for encrypting the exported data (required). Here, the user can select from a list of certificates that exist in the local machine certificate store. If the export application is run with administrator privileges, then the user may also install a certificate from a file and use that for encryption. This functionality is the same as for selecting or installing a local organisation certificate in the FM Admin.
- Optionally choose to exclude patient related messages from the export (such as M1, M2, M9.5, etc). This parameter is shown as a checkbox that will be unchecked by default (i.e. by default, messages are exported). If the user checks this checkbox, the messages will not be exported. Excluding the messages from the export will in most cases considerably reduce the size of the export. This option is meant to be used by installations that have a large number of messages and have some other means to transfer this data to the receiving system, e.g. using database backup/restore.

The “Start eksport” button will be disabled until the user has selected the output directory and certificate. Clicking this button will start the export. A progress dialog will be shown that reports the total number of

patients that will be exported and the number of patients already exported. This popup will have a Cancel button to stop the export.



When the export is started, the export application will automatically shut down the FM server. This means that the export application can only be run on the FM server machine. This is done to ensure that no updates are done while the export is running. Therefore, the FM client and the FM Admin application cannot be used, users will get an error message saying that the FM server cannot be reached. After stopping the server, no scheduled tasks are run, and any asynchronous messages received from RF will not be processed.

The export application will monitor the FM service and if it detects that the service has been started, a warning message will be shown, and the user asked if the export should continue or be cancelled. The export should continue to run in the background, until the user chooses to cancel.

This monitoring will be implemented by checking a “heartbeat” that the FM server registers in the FM database once per minute.

2.4.1.1 Multiple FM application servers (load balancing)

In installations where two or more FM application servers are running, the Export application will not be able to shut down all the servers, since these will be running on different machines. Currently, there are very few such installations and it is assumed that administrators will manually shut down these extra application servers before starting the export.

The Export application should in this case show a message before starting the export, with a list of the known application servers and ask the user to confirm that these have been stopped.

The Export application will still be able to detect if any of these servers are running (using the server “heartbeat”) and to show the warning message and offer the user to continue or be cancel the export.

2.4.1.2 Multiple FM installations on a single machine

The Export application will need to handle the case where multiple FM application servers are running on the same machine, where each instance is connected to different FM databases. In this case, each instance has its own service name and the user will need to select which instance should be exported. This will be done by showing a combox with the instance names in the login dialog:

Nothing should be selected by default and the OK button should be disabled until the user has selected an instance.

2.4.2 Patient related data

The following sections include details of which data will be exported.

2.4.2.1 Patient information

Information for all patients will be exported. Note that this data may be outdated, FM only stores the patient information received from the EPJ system when the patient was last opened in FM.

The exported patient data includes:

- Basic demographic information
    - Name
    - Date of birth
    - Sex
    - Nationality
    - Identities (FNR, DNR, XXX-id, etc.)
    - Address(es)
    - Telecom (phone, email, etc.)
- PLO registration: name, HER-id, address, etc.
- GP ("fastlege"): name, HPR-id
- Multidose-responsible doctor: name, HPR-id
- Delivery request („ekspederingsanmodning") comments?
- Medication review information
    - List of performed reviews
        - Date
        - User
        - Comment
        - List of information sources
        - Reference to an M25 message, representing the LIB
    - Date of next planned review
    - Should the patient be excluded from reviews

2.4.2.2 Messages

All messages that have been sent or received by FM will be exported. The following types of messages will be exported:

- All RF resept lookup requests and replies (M9.5 and M9.6)
- All RF PLL/multidose lookup requests and replies (M9.11 and M9.12)
- All KJ lookup requests/responses
- All M25.1, M25.2 and M25.3 messages (sent or received) for each patient
- All prescription messages (M1). Note, that this only includes messages that have been sent to RF or received from RF/KJ. Note that FM also stores M1 messages for prescriptions that are not e-resept, e.g. printed, fax, telephone or locally registered prescriptions (Reg). These prescriptions will be exported (as described in section 2.4.2.4.1), but the M1 messages will not be exported. Also, M1 messages for drafts and unsent M1 messages will not be exported.
- All delivery messages (M6, M8, M8.1, M9.8, M25.3)
- All recall messages (M5)
- All recall notifications (M7)
- All Helfo applications and replies (M2, M12)
- MD patient status update requests and replies (M9.21, M9.22)
- Subscription to receive delivery notifications (M24.1, M24.2)
- Multidose responsible doctor registrations and replies (M27.1, M27.2)
- All SLV replies (M15)
- Notifications about changed multidose-responsible doctor (M28)
- Any AppRec messages related to the above messages. These can be either AppRec messages that FM has received from RF or Helfo, or AppRec messages that FM has sent. Note that in some cases there can be more than one AppRec related to each message, e.g. when sending an M1 fails with a negative AppRec and re-sending the M1 succeeds.
- M25.1 messages generated as a part of a medication review for a patient. This represents the local LIB at the time of review.

2.4.2.3 CAVE

All known CAVE information will be exported. This includes CAVE records registered in FM or received from EPJ or via M25 messages. This includes history for each CAVE record and will include records marked as inactive, discarded, disproved (“avkreftet”) or deleted.

The CAVE information will be exported in the format that was specified for the EPJ API, which includes the following information for each CAVE record:

- Patient ID
- A unique ID for the record
- A groupID for keeping track of history. Different versions of the same CAVE record will have the same groupID. Also, a “current” flag will indicate if this is the latest (current) version of the record.
- Flag to indicate reaction to an inactive ingredient or an active ingredient.

- Text describing the reaction.
- Date of registration.
- The name of the user who registered the CAVE.
- Flag to indicate if the CAVE entry is active or inactive.
- The medication, active substance or ATC code.
- The type of allergic reaction (from coding system 7497)
- The source of the CAVE information (from coding system 7498)
- Seriousness (code for critical/serious/less serious)
- Likelihood (kodeverk 7521)
- When discovered (date or age or unknown/not specified)
- Flag for “discarded”
- Flag for “deleted”, along with reason and user who deleted
- Disproved flag and comment

2.4.2.4 Treatment/prescription information

All prescription information will be exported. This export will include all prescriptions that are (or have been) a part of the VIB, including

- All types of prescriptions: medications, NIB, FIB and vaccines.
- Local registrations (Reg)
- All known history for these prescriptions, including a detailed version history.
- Prescriptions that have been deleted or removed (as part of the remove/replace LIB operation).
- Prescriptions received in an RF/KJ lookup and have been marked as discarded, or have not been handled locally. Note that these prescriptions have never been a part of the local LIB.
- AK journal information
- Drafts

This export will be structured as treatments, where each treatment may contain one or more prescriptions and each prescription will have one or more versions. As an example, adding a new medication prescription draft to the LIB will create a new treatment with a prescription that has one version. If this draft is then edited, a new version will be created. Accepting the draft will create the third version and signing and sending this to RF will create the fourth version. If this item is later renewed, a new prescription will be created.

2.4.2.4.1 Medication treatments (LIB)

The following medication treatment information will be exported

- A unique ID. If a resept exists, this will be the resept-id (i.e. the MsgId of the M1 message), otherwise an ID generated by FM. This can be used to match to an exported M1 message (see section 2.4.2.2)

- For prescriptions that are not e-resepts (i.e. no M1 message is exported), the corresponding prescription data will be exported using a data structure based on the Resept element from the M1 definition, i.e. without the MsgHead envelope.
- LIB ID (to keep track of history items for a treatment). For PLL, this will be the M25 LIB ID
- Reference to previous version of this treatment, to support history.
- For locally registered medications: reference to local medication/preparation
- Prescription type
    - eRp/uRp (not yet sent or printed)
    - eRp (e-resept)
    - uRp (printed)
    - fRp (fax)
    - tRp (telephone)
    - Reg (local registration)
    - iRp (imported)
    - iReg (imported without resept)
- Seponering information (for stopped treatments)
    - Date/time
    - Coded reason
    - Comment
    - User
- Delivery information for all known deliveries
- Start date
- Date/time of creation
- Local status
    - M1 pending
    - M1 failed (including an error message)
    - M5 pending
    - M5 failed (including an error message)
- Responsible users
    - Instituert av (instituted by): The doctor and/or the institution/ward that started the treatment.

  - Forespurt av (requested by): When registering a draft prescription, this specifies the doctor who requested the prescription.
  - Registrert/sist endret av (registered by/last edited by): The user who created or last edited the prescription. This may be any user with privilege to create/edit a prescription (i.e. including assistants, nurses, etc.). This is not shown when the prescription has been sent/printed.
  - Godkjent av (approved by): The user who approved a draft version of the prescription. This may be a nurse if this is a “double-signed” local registration.
  - Forskriver (forskriver): The name/HprId of the prescriber. When registering a prescription draft or renewal, an assistant can select any local doctor as Forskriver. Doctors however cannot do this - the doctor registering a prescription will always be set as the Forskriver.

- Diagnosis code (indikasjon) ICD10/ICPC
- Flag to indicate if generic substitution is allowed or not
- Reason for not allowing generic substitution
- Reason for ignoring CAVE warning
- Recall reason
- Change reason
- “Forholdsregel ved inntak”
- Anticoagulation information
  - INR value
  - Date of INR measurement
  - Minimum INR
  - Maximum INR
  - Date of next planned INR measurement
  - Comment
  - Date of next planned dosing evaluation
- For drafts: draft type
  - New prescription
  - Renewal
  - Import
  - Stop
  - Recall
- Pharmacy questions and answers (only for multidose)

- For prescriptions that have been removed from the LIB or discarded external items, i.e. explicitly excluded from local LIB:
    - Date/time of removal
    - User who removed
    - Type of removal:
        - Deleted
        - Discarded
        - Local LIB emptied by user
        - Rejected pharmacy proposal (M25.2)
    - For deleted prescriptions: Coded delete reason (from kodeverk 9237)
    - Comment

2.4.2.4.2 NIB, FIB and vaccine treatments

The exported information for NIB, FIB and vaccine treatments will use the same structure as for the LIB treatments described above. Some elements are not applicable (e.g. AK information). The main difference is that the NIB and FIB information will have a ReseptDokHandelsvare element whereas LIB and Vaccine have a ReseptDokLegemiddel.

2.4.2.4.3 Rejected drafts / Undone registrations

When a draft for a new prescription is registered and then a doctor rejects this draft, it will be deleted from the FM database. The same applies when creating a new prescription and selecting to undo this registration. These prescriptions will therefore not be directly available for export. A copy of these prescriptions is however stored in an “audit log”. They can be extracted from this log and exported in the same format as other prescription information, but not all details will be available.

2.4.2.5 Local LIB comments

For each treatment, there may exist a local comment. Each comment may have a history, i.e. a new version is created when the comment is edited. The comment history is exported for each treatment, also comments that have been deleted. This includes the following data:

- Date/time created/edited
- User who created/edited
- The comment
- If the comment has been deleted:
    - Date/time of deletion
    - User who deleted

2.4.2.6 VIB confirmations

All VIB confirmations that have been done will be exported. This information includes

- Patient Id

- The user that confirmed
- Confirmation type (Admission, PreliminaryAdmission, Discharge, AfterChange, Other)
- Date/time of confirmation
- Comment
- Other information (text)
- Institution Id
- M25.1 message Id (when registering an automatic VIB confirmation after sending a PLL message, this refers to the M25.1)

2.4.2.7 "Unstructured" history

FM may store old prescription history information, imported to FM from an older EPJ system when the FM was introduced (this is shown in the FM main window, in a tab labelled "EPJ resepter"). This is stored as a single HTML document for each patient and will be exported as such.

2.4.2.8 Medication review

All medication reviews performed for a patient will be exported

- Patient Id
- Doctor who performed the review
- Date of review
- Comment
- Information sources (e.g. Pasient, Kjernejournal, Reseptformidleren, Epikrise)
- An M25.1 document that contains the patient's LIB (and CAVE) at the time of review

formaterte: Norsk (bokmål)

2.4.2.9 Helfo applications

All HELFO applications will be exported. These can be electronic, where an M2 was sent and M12 reply may have been received

- Patient Id
- Medication (brandname, product group (NIB), local medication, preparation)
- Requesting doctor (HPR id)
- Date/time sent
- Refusjonshjemmel
- Refusjonskode
- "Draft" flag
- For deleted applications:
    - date/time of deletion,
    - user who deleted

- For electronic applications (M2 sent)
    - Reference to M2 document
    - Reference to (zero or more) M12 reply documents
- For local registrations (no M2 sent)
    - Applicant name
    - Reply
        - Date of acceptance
        - Status (granted or rejected)
        - Justification (text)
        - Valid until (date)

2.4.2.10 Handled medication interactions

When interactions are detected between medications in the VIB, the user may choose to ignore the interaction warning, by marking them as “handled”. This can be done either for a particular interaction (where medications A and B interact). For these, the following data is exported:

- Treatment1 Id
- Treatment2 Id
- Interaction Id (from FEST)
- Active flag
- Comment
- Date/time when marked has handled
- User that marked as handled

The user may also suppress interaction warnings for a selected prescription. For these actions, the following data is exported:

- Treatment Id
- Active flag
- Comment
- Date/time when marked has handled
- User that marked as handled

2.4.3 Other information (not patient related)

2.4.3.1 User information

Information on all users in FM will be exported. Note that some of these users may be flagged as inactive (i.e. do not have access to FM), but they may have some data linked to them (such as prescriptions they have created).

The following data will be exported for each user:

- User ID (internal ID from FM)
- Username (as defined by the EPJ system)
- User type (Admin, Doctor, Assistant, ReadOnly, Nurse, Dentist, Helsesoster, Midwife). Can be more than one value (e.g. Admin and Doctor)
- "Disabled" flag, i.e. user cannot open FM
- Available demographic information:
    - Name
    - Address
    - Identities (HPR, FNR, etc. based on kodeverk 8116)
- Healthcare profession type (from kodeverk 9060)
- Specialities (from kodeverk 7426)
- User configuration parameters:
    - Use ICPC or ICD-10 when registering "refusjon"
- User privileges
    - Doctor's prescription privileges (All, not A, not A and B)
    - User has prescription rights (for midwifes and helsesøster)

2.4.3.2 Institution configuration

The following FM institution configuration parameters will be exported:

- Name
- StreetAddress
- PostalCode
- City
- PhoneNumber
- EnhId
- HerId
- RshId

2.4.3.3 Reports

All reports successfully generated and persisted in the FM reporting module will be exported. These will be converted to ~~PDF~~XPS documents and exported along with the following metadata:

- User who created the report
- Patient id (for patient specific reports)

- Date/time when created
- Report title
- Institution
- A reference (file path) to the exported ~~PDF~~XPS file

2.4.3.4 Protocols

All protocols will be exported. These can either be registered as private for a specific user or an organizational unit (organization, department, etc.). As the organizational information is not exported, these will instead be linked to the institution.

The following data will be exported for each protocol:

- Protocol name and description
- User who created
- Create date/time
- Owning user or institution
- Treatment phase ("Behandlingsfase") (from kodeverk 7473)
- Caution ("Forsiktighetsregel") (from kodeverk 7476)
- Dose by (weight, age, etc.) (from kodeverk 9080)
- Diagnosis code (from kodeverk 7110 or 7170)
- A list of the prescription templates (see section 2.4.3.6) used in the protocol

formaterte: Norsk (bokmål)

2.4.3.5 Local medications

All locally created medications ("uregistrert") will be exported.

- Name
- Active ingredient (name or a reference to FEST)
- ATC code
- Strength (amount and unit from kodeverk 9090)
- Strength denominator (amount and unit from kodeverk 7452)
- Form (from kodeverk 7448)
- Dose unit (from kodeverk 7452)
- Group ("reseptgruppe")
- Indication (freetext)
- Usage ("bruksområde", freetext)
- Simplified dosing ("forenklet doseringsveildening", freetext)
- Producer

- Create date/time
- Preparation type (kodeverk 7424)
- Active/deleted flag
- Owning institution or user

2.4.3.6 Local prescription templates

All local prescription templates will be exported, except for those who have been marked as deleted. These are stored in the FM as prescriptions with some extra metadata:

- Template name
- Owning user or institution
- Prescription template data (represented by a ReseptDokLegemiddel/ReseptDokHandelsvare data structure from the M1 definition)
- Diagnosis code (indikasjon) ICD10/ICPC
- Flag to indicate if generic substitution is allowed or not
- Reason for not allowing generic substitution
- "Forholdsregel ved inntak"

2.4.3.7 Local preparations

All local preparations will be exported. For each preparation, the following data is exported:

- Name
- Instructions
- Date/time created
- Package size (amount and unit from kodeverk 7452)
- Form (from kodeverk 7448)
- Active flag
- Owning user or institution
- Preparation type, one the following values
    - V = "1", DN = "", OT = "Enkel blanding"
    - V = "2", DN = "PAR-NUT", OT = "PN Parenteral ernæringsblanding"
    - V = "3", DN = "PAR-SME", OT = "PS Parenteral smerteblanding"
    - V = "4", DN = "PAR-ANT", OT = "PA Parenteral antibiotikablanding"
    - V = "5", DN = "PAR-CYT", OT = "PC Parenteral cytostatikablanding"
    - V = "6", DN = "", OT = "Blanding med tilleggsinformasjon"
- For each ingredient:

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- Name
- Amount (with unit from kodeverk)
- Optionally, a reference to a Virkestoff, LegemiddelMerkevare, LegemiddelVirkestoff, Legemiddelpakning or a local medication. Ingredients may also be specified with just a name (“free-text”)
- Active ingredient/“hjelpestoff” flag
- Ad flag
- Qs flag
- “Reseptgruppe” (from kodeverk 7421)
- Strength value

2.4.3.8 Inbox messages

All messages from the doctors’ inboxes that have not been marked as read, will be exported. The following data will be exported for each inbox message:

- User Id of the doctor
- Sender name
- Message type:
  - 1: Utleveringsrapport til rekvirent
  - 2: Resept er blitt slettet
  - 3: Utleveringsrapport til fastlege
  - 4: Helfo søknadssvar til rekvirent
  - 5: SvarSLV til rekvirent
  - 6: Oppdatering av FEST har feilet
  - 7: Korrespondanse mottatt fra EPJ
  - 8: Resept har utløpt i signeringskøen
  - 9: Tilbakekalling av resept har utløpt i signeringskøen
  - 10: Utleveringsrapport med intervensjon til rekvirent
  - 11: Utleveringsrapport med intervensjon til fastlege
  - 12: Medarbeider har laget/registrert resept for pasient
  - 13: Apotek har levert ut legemiddel som ikke finnes i FEST
  - 14: Apotek har levert ut legemiddel som ikke finnes i FEST
  - 15: FEST oppdatert
  - 16: Feil ved nedlastning av referansenumre fra RF

- 17: Varsel fra Legemiddelverket
- 18: Lege har resepter som må sendes/skrives ut
- 19: Medarbeider har skrevet ut resept(er)
- 20: Feil ved signering og sending av resept
- 21: Melding om endring av multidoseansvarlig lege
- 22: Spørremelding fra apotek er mottatt
- 23: Ny FM version installert
- 24: Apotek har besvart legekommentar på LIB-element
- 25: To pasienter ble slått sammen
- 26: Sykepleier har laget/registrert resept for pasient
- 27: Varsel fra Legemiddelverket
- 28: Noen eller alle av de eldre backup filene ble ikke fjernet i løpet av database backup
- 29: Pasienten har oppdatert informasjon i Reseptformidleren. Gjør nytt oppslag i Reseptformidleren for oppdatert informasjon
- 30: Pasientens Legemiddelliste (PLL)
- 31: Feil ved sending av «Verify» melding til RF
- 32: Manglende driftsleverandør informasjon

- Date/time created
- PatientId (if this is a patient-specific message)
- PrescriptionId (if related to a prescription)
- DocumentId (if related to a received document, e.g. M12)
- Message text

2.4.4 Information that will not be exported

Some information from the FM database will not be exported, either because this type of information will not be used by the receiving system, or because it can be re-built from other sources.

2.4.4.1 Rates (“Takst”)

The “rates” records that doctors can register for certain tasks, such as sending Helfo applications or doing medication review, will not be exported.

2.4.4.2 Unused RF reference numbers

The FM database may contain (usually only a few) reference numbers that have been downloaded from RF, but not yet used for locked prescriptions (or other prescriptions where reference numbers are used). These reference numbers will not be exported.

2.4.4.3 Local “kortdoser”

The “kortdoser” that can be registered in the FM Admin and linked to medications, will not be exported.

2.4.4.4 Organizational hierarchy

The FM includes support for defining an organizational hierarchy with departments, wards, etc. This is currently only used by two hospital installations.

Some FM data can be linked to units in this hierarchy

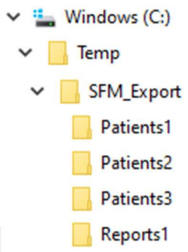
- Local medications
- Preparations
- Protocols
- Templates

When exporting this data, it will be linked to a corresponding FM institution (section 2.4.3.2).

2.4.5 Export format

The exported data will be saved in files in the selected directory, or sub-directories of that directory. The FM data for each patient will be exported to a single file in a sub-directory of the given root directory. Due to technical reasons, each sub-directory can contain no more than 16.000 patient files, so therefore, multiple sub-directories may be needed if the FM database contains information for more than 16.000 patients.

The example below shows the export directory structure when more than 32.000 patients have been exported from the database. Here, three sub-directories are needed for the patient export files:



The root directory (C:\temp\SFM_Export in this example) will contain two files:

- An xml file containing all non-patient related data, as specified in section 2.4.3
- An “index” file. This is a text file containing a list of all the patient export files in all sub-directories. Each line in this file will contain the relative path of the file, e.g. “Patients1\d8a7ead8-aa42-4d90-9eaf-7e770e6c8ab3.pat”

This root directory will also contain one or more sub-directories, named “Patients1”, “Patients2”, etc., where the exported patient specific data is saved. These sub-directories will contain one file for each exported patient. This file will contain a compressed and encrypted collection of the following files:

- Each document (M1, M2, etc.) is saved as a separate xml file. The file name for a document file will be the ID of the message, where this exists (e.g. MsgHead/AppRec messages). For other messages, the file name will be auto-generated GUID.
- Other patient related data (as specified in section 2.4.2) is stored in a single xml file. This file will have the name “PatientData.xml”.

The name of this patient data file will be the internal FM patient ID (which is a GUID), with a file extension ".pat" (e.g. "d8a7ead8-aa42-4d90-9eaf-7e770e6c8ab3.pat").

This collection of patient files will be packaged in a zip file, which is then encrypted.

The procedure for exporting data for a single patient will then be as follows:

1. save all documents for this patient into separate files in an empty temporary directory
2. build an xml structure for other patient related data and save this in a separate file
3. package the files created in steps 1-2 into a zip archive
4. delete the original files created in steps 1-2
5. encrypt the zip file created in step 3
6. move the encrypted file to the patient data export directory (creating a new directory if needed)
7. add a reference to the patient file in the index file in the root directory

The root directory may also contain one or more sub-directories, named "Reports1", "Reports2", etc., where the exported reports are saved, as specified section 2.4.3.3. These sub-directories will contain one ~~PDF~~XPS file for each exported report. Each file will be ~~compressed and~~ encrypted (note, that XPS is a zip file, so there is no need to compress it before encrypting).