Registry - Data Pull

Version 2.2

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# Document Information

<table>
<thead>
<tr>
<th>Document Owner</th>
<th>FIGmd Operations Team</th>
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## Current Version - 2.2

<table>
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<tr>
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<th>Reviewed By</th>
<th>Review Date (Month DD, YYYY)</th>
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## Revision History

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</tr>
</tbody>
</table>
# Table of Contents

1. General Information  
   1.1. Document Conventions  
   1.2. Acronyms  

2. Data Extraction  
   2.1. Overview  
   2.2. Prerequisite for Data Extraction using Data Pull  

3. Data Extraction Procedure  
   3.1. End-to-End Data Flow  
      3.1.1. Practice Environment  
         3.1.1.1. FIGmd Enterprise Connector (FEC)  
         3.1.1.2. Practice Systems  
      3.1.2. Registry Environment  
         3.1.2.1. FIGmd Enterprise Connector (FEC) Management Server  
         3.1.2.2. Clinical Data Upload Server (CDUS)  
         3.1.2.3. Clinical Data Repository  
         3.1.2.4. Data Marts  
         3.1.2.5. Registry Dashboard  
      3.1.3. FEC Installation  

4. FAQs  
   4.1. About FEC  
   4.2. Registry Dashboard
1. **GENERAL INFORMATION**

1.1. Document Conventions

**Callouts**
- Alpha-numerical callouts in the images represent processes.
- The callout prefixed by (Figure 1)
  - **P** denotes the practice side component and the number indicates the sequence of the pull process.
  - **R** denotes the registry side component and the number indicates the sequence of the pull process.

**Hyperlinks**
- Hyperlinks have been used in the document to easily reference detailed explanations related to a specific topic placed at some other location within the document.

![Figure 1: Alphanumeric Callouts](image)

1.2. Acronyms

<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCDA</td>
<td>Consolidated Clinical Document Architecture</td>
</tr>
<tr>
<td>CDR</td>
<td>Clinical Data Repository</td>
</tr>
<tr>
<td>CDUS</td>
<td>Clinical Data Upload Server</td>
</tr>
<tr>
<td>DD</td>
<td>Data Dictionary</td>
</tr>
<tr>
<td>EHR</td>
<td>Electronic Health Record</td>
</tr>
<tr>
<td>FEC</td>
<td>FIGmd Enterprise Connector</td>
</tr>
<tr>
<td>GCP</td>
<td>Google Cloud Platform</td>
</tr>
<tr>
<td>GCS</td>
<td>Google Cloud Storage</td>
</tr>
<tr>
<td>LIS</td>
<td>Laboratory Information System</td>
</tr>
<tr>
<td>PMS</td>
<td>Practice Management System</td>
</tr>
<tr>
<td>RCM</td>
<td>Revenue Cycle Management</td>
</tr>
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</table>
2. **DATA EXTRACTION**

2.1. Overview

FIGmd retrieves data from the client’s EMR either by Data Pull or Data Push method of extraction.

For Data Pull, **FIGmd’s patent-pending** data extraction software - the **FIGmd Enterprise Connector (FEC)** is installed on a workstation. The registry reporting process is fully managed by FIGmd and presents minimal impact to the practice with optimum results. In this process, the least effort is required from the practice’s technical staff or the EHR vendor.

2.2. Prerequisite for Data Extraction using Data Pull

- Microsoft® Windows Operating System (O/S) with Microsoft® .NET 4.0 framework installed.

3. **DATA EXTRACTION PROCEDURE**

In the **Data Pull** method of data extraction, the FEC is installed on a computer that has access/connectivity to the EHR database (or a current copy).

A **read-only** user account is required for the FEC to directly access the EHR database. Once mapping to the appropriate fields is completed, the FEC performs a Data Pull at predefined intervals and submits the data to the registry.

The **Data Pull** environment is divided into

1. **Practice Environment**

   The **Practice** environment comprises of

   - **FIGmd Enterprise Connector (FEC)**
   - **Practice EHR server**

2. **Registry Environment**

   The **Registry** environment comprises of

   - **FIGmd Enterprise Connector Management Server**
   - **Clinical Data Upload Server**
   - **Clinical Data Repository**
   - **Data Marts**
   - **Registry Dashboard**

**Note:** Depending on the data received from the **EHR**, **FIGmd** may need to integrate with the **Practice Management System (PMS)** for any missing data.
### 3.1. End-to-End Data Flow

#### Data Pull Integration

<table>
<thead>
<tr>
<th>Practice Environment</th>
<th>Registry Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>FIGmd Enterprise Connector</td>
</tr>
<tr>
<td>P2</td>
<td>Practice Systems (EHR, PMS, RCM, LIS)</td>
</tr>
<tr>
<td>R1</td>
<td>FEC Management Server</td>
</tr>
<tr>
<td>R2</td>
<td>Clinical Data Upload Server</td>
</tr>
<tr>
<td>R3</td>
<td>Clinical Data Repository</td>
</tr>
<tr>
<td>R4</td>
<td>Data Marts</td>
</tr>
<tr>
<td>R5</td>
<td>Registry Dashboard</td>
</tr>
</tbody>
</table>
3.1.1. Practice Environment

The practice environment comprises of:

P1- FIGmd Enterprise Connector
P2- Practice Systems
3.1.1.1. FIGmd Enterprise Connector (FEC)

The FEC (Figure 4)
- Serves as a link between the registry and the practice.
- Transmits data from the practice EHR server to the Clinical Data Upload server at FIGmd via a secure port.
- Initiates data mapping immediately after the installation.
- Performs data pull on the EHR server once the required field mapping is completed.

**Technical Specifications**
- Microsoft Windows operating system with Microsoft.Net 4.0 framework needs to be installed.
- A read-only user account is needed to access the EHR database.

3.1.1.2. Practice Systems

Practice EHR/PM system holds the patient’s clinical data (Figure 5).

**Prerequisites**

The practice EHR can be:
- **EHR** and/or a billing database (PM System).
- A computer system at the practice side that stores patient’s clinical encounter details.
3.1.2. Registry Environment

The registry environment comprises of:

R1. FEC Management Server
R2. Clinical Data Upload Server
R3. Clinical Data Repository
R4. Data Marts
R5. Registry Dashboard

*Figure 6: Data Pull in Registry Environment*
### 3.1.2.1. FIGmd Enterprise Connector (FEC) Management Server

**Purpose**

The FIGmd Enterprise Connector (FEC) Management Server (Figure 7),
- Handles the FEC installed at the practice side.
- Acts as a proxy to FEC.
- Initiates a session on this connection for data extraction from practice EHR.

**Prerequisites**

- A connection between FEC and FEC Management Server is established after the FEC is installed.
- It securely connects to the port using a 256 bit Rijndael encryption key.

### 3.1.2.2. Clinical Data Upload Server (CDUS)

The practice FEC accesses CDUS to transmit the de-identified clinical data that is reported to the registry (Figure 8).

A scheduled job pushes the encrypted data from the practice EHR to the CDUS hosted on the GCP that resides out of the practice IT system.

The data is stored in a CCD compliant format in two file types:
- Demographic data file.
- Clinical data file.

**Purpose**

CDUS in FIGmd environment:
- Uploads/transmits all the data related to a patient visit to the Clinical Data Repository (CDR).
  - CDUS upload sessions can only be initiated at the practice side and not from the registry data center.
- Uploads the patient details into the Registry Data Center.

**Prerequisites**

- The CDUS is hosted on a cloud environment outside the practice IT system.
- The upload takes place via https: port 443 using a 2048-bit RSA encryption key.
### 3.1.2.3. Clinical Data Repository

The **Clinical Data Repository** (CDR) stores data uploaded through the **Clinical Data Upload** (CDU) server (Figure 9).

**Purpose**

- It processes the structured data collected by FEC and removes the duplicate and redundant data. The data processing involves:
  - Data Mapping
  - Data Validation
  - Data Cleaning
  - Data Loading
- Stores the data in a normalized CDR format.

**Prerequisites**

- CDR is stored on Google Cloud Storage (GCS) bucket. By default, data is encrypted using Google managed keys.

### 3.1.2.4. Data Marts

Data from the **CDR** is converted into FIGmd specific database format called **Data Marts** (Figure 10).

- Support practice requirements such as quality measure calculations.
- Are displayed on the practice dashboard for review.
3.1.2.5. Registry Dashboard

The dashboard displays measure-specific data (Figure 11).

It supports:
- View measure details.
- Export measure details in the required format (PDF, .CSV, and .XLS format).
- View and analyze the performance trend of measures against the registry benchmark and registry average.
- Generate reports.
- Raise tickets through the service desk.

3.1.3. FEC Installation

FIGmd sends FEC installation link via email to the authorized IT personnel. The authorized IT personnel will use a local admin account while installing the FEC in the practice environment.

Follow the below steps to install FEC:

Role of IT Personnel:
1. Click the installation link in the email OR Copy the FIGmd FEC installation link to a browser and run it. A zip file containing the FEC setup gets downloaded.
2. Right-click Setup.exe and click “Run as administrator”.
3. Enter the registration key emailed with the installation link in the displayed field.
4. Select the server to install the FEC.
5. Configure FEC to extract patient data from EHR (Refer notes to the right).

Notes:
- The extracted data is temporarily stored in an encrypted compressed format.
- A scheduled job then pushes the data to the FIGmd database hosted on the Google Cloud Platform (GCP).
- The extracted data is then processed in the registry CDR warehouse.

Role of FIGmd Mapping Team:
1. FIGmd ETL team will interface with practice EHR database via FEC using SPINE to create a map for the respective practice. The team may ask for the assistance of the IT personnel in the final mapping process.

Notes:
- To extract the missing data if any, FIGmd’s FEC may need to integrate with the Practice Management System (PMS).

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1 FEC is installed as an add-on service.
4. FAQs

4.1. About FEC

1. Who installs the FEC?
The participant practice/group admin installs the FEC. FIGmd technical support team may assist as required.

2. Where is the FEC installed?
The FEC is installed on a machine (typically within the practice network) that has access/connectivity to the practice EHR database.

3. Who can access the FEC?
Practice/Group IT admin and FIGmd staff can access FEC for troubleshooting.

4. What does the FEC connect with?
The FEC connects to the EHR database having a read-only account.

5. Does the FEC have access to PHI?
Yes, FEC has access to PHI.

6. Does the FIGmd FEC store PHI?
No, the FEC does not permanently store PHI, the registry stores the PHI. The data extracted by FEC is temporarily stored in a compressed and encrypted format, on the local file system. Once securely uploaded to the CDUS, the extracted data is permanently deleted from the local file system.

7. What are the outgoing connections from the FEC?
The only outgoing connection from the FEC is from GCP to the CDUS.

8. What are the hardware requirements for installation of the FEC?
The minimum specifications for the computer (or virtual machine) running the FIGmd Enterprise Connector (FEC) service are:
   ● Processor: 4 vCPU.
   ● Memory: 8 GB *
   ● Hard Drive: 50 GB of free space expandable to 200 GB
   ● Operating System: Microsoft Windows
   ● Microsoft .NET 4.0 framework
   ● Broadband Internet Access

* Up to 8 GB (Giga Bytes) of memory is required only during scheduled data extraction and upload jobs. On an average 700-800 MB (Mega Bytes) of memory will be used while the service is idle. This configuration will accommodate the majority of large sites. However, additional resources may be required.
4.2. Registry Dashboard

1. **Where is the registry dashboard hosted?**
   The registry dashboard is hosted on the Google Cloud Platform.

2. **Who deploys the registry dashboard portal?**
   The FIGmd delivery team deploys the registry dashboard.

3. **Who can access the registry dashboard?**
   Practice Admin, Practice clinician can access the registry dashboard.

4. **Does the registry dashboard display PHI?**
   Yes, the registry dashboard displays PHI.

5. **What are the hardware requirements for registry dashboard deployment?**
   Following browsers are compatible with registry dashboard deployment:

<table>
<thead>
<tr>
<th>Browser</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chrome</td>
<td>65 and above</td>
</tr>
<tr>
<td>Safari</td>
<td>11 and above</td>
</tr>
<tr>
<td>Mozilla Firefox</td>
<td>60 and above</td>
</tr>
<tr>
<td>Internet Explorer</td>
<td>11 and above</td>
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