

**ITPR039864**

SDA - SimpleDose

**Solution Design**

**SD Document**

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**Solution Design Document Version for ITPR038223**

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**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Author | Changes |
| 0.01 | 8/18/2020 | Paul Jolin | Initial Version |
| 0.02 | 8/28/2020 | Paul Jolin | Updated based on external review feedback |
| 0.03 | 8/28/2020 | Naga Vankineni | Updated PI2 batches and review comments |
| 0.04 | 9/1/2020 | Paul Jolin | Added 19.3 Batch Server Sizing sheet |
| 0.05 | 10/21/2020 | Naga Vankineni | Added new NFR (submitMdpOrder) |
| 0.06 | 10/21/2020 | Naga Vankineni | Added new NFR (#21) for UI Reports |
| 0.07 | 4/20/2021 | Naga Vankineni | Updated Sections 8.2.4, 12.1 – Updated with Order Management |
| 0.08 | 4/20/2021 | Naga Vankineni | Updated Sections 4 – Updated RxDW description to reflect SDA reporting |

**Convention Notes:**

- Instructions and boilerplate text which is in *italics* can be removed by the author after thoroughly understanding the instructions.

- Some sections contain sample data or diagrams. This must be removed to avoid confusion and replaced with relevant data.

- Any section which does not apply to the subject project must have “Not Applicable” inserted or it will be considered applicable but overlooked. Such sections can have their text color changed from black to gray for easier reviewing.

- Following a review, it is extremely helpful if Revision Tracking (Track Changes) is turned on before making changes. This will facilitate the reviewers’ location of changed text.

**File Naming Convention:**

Save the SD file as “SD- [ITPRxxxxxx], [Project Name], [yymmdd].docx”. Using this convention will allow the file to list in consistent order in the SD Review Site.

**EA Solution Design Document Template Location:** [Solution Design Document Template:](http://sharepoint/sites/myArchitecture/DocumentArchive/Lists/SEP%20support/DispForm.aspx?ID=1&Source=http%3A%2F%2Fsharepoint%2Fsites%2FmyArchitecture%2FDocumentArchive%2Fdefault%2Easpx)Table of Contents

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# Purpose, Audience and Design Guidelines

Solution Design is a framework and foundation within which subsystems, applications, application components, their relationship to each other, their dependencies and their interoperability are architected and designed to form a solution supporting and enabling a business process. It defines the set of standards and practices governing the overall solution being developed and deployed into production.

[Infrastructure Design (ID)](http://sharepoint/sites/myArchitecture/Infrastructure/Shared%20Documents/Forms/AllItems.aspx?RootFolder=http%3a%2f%2fsharepoint%2fsites%2fmyArchitecture%2fInfrastructure%2fShared%20Documents%2fProcess&FolderCTID=0x0120009EC56379D5207B4884797AA9D1620875) is a separate artifact that supports the Solution Design

Application Design (AD or AAD) is a separate artifact that supports the Solution Design

For certain selected projects (SEP or Agile) Application Design (AD or AAD) would be covered as a section in this document.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Methodology / Sections** | **Author** | **CVS Agile** | **aGile** | **Scrum/XP** | **Waterfall** |
| Project Introduction (Scope etc.) | Application Architect | Yes | Yes | Yes | Yes |
| Functional Impact Analysis | Application Architect | Yes | Yes | TBD | Yes |
| Interface Specification | Application Architect | Yes | Yes | Yes | Yes |
| Architecturally significant requirements & key technical concerns | Application Architect | Yes | Yes | Yes | Yes |
| Reference Architectures and reusable Design Patterns | Application Architect | Yes | No | No | Yes |
| Standards Adherence & Exceptions, Design Risks | Application Architect | Yes | No | No | Yes |
| Conceptual Solution Design | Application Architect | Yes | Yes | Yes | Yes |
| Business Architecture | Application Architect | Yes | No | No | Yes |
| Information(Data) Architecture | Application Architect | Yes | No | No | Yes |
| Data Model | Application Architect | Yes | Yes | Yes | Yes |
| Component Design | Application Architect | Yes | Yes | Yes | Yes |
| Integration Matrix | Application Architect | Yes | No | No | Yes |
| Solution Services Architecture (ESL) | Enterprise Architect | No | No | No | No |
| Batch Details | Application Architect | No | Yes | Yes | No |
| Security Architecture | Application Architect | Yes | Yes | Yes | Yes |
| Mobility Architecture |  | No | No | No | No |
| Miscellaneous Design Considerations | Application Architect | Yes | No | No | Yes |
| Capacity View | Application Architect | Yes | Yes | Yes | Yes |
| Logging and Monitoring | Application Architect | Yes | Yes | Yes | Yes |
| Non Functional View | Application Architect | Yes | Yes | Yes | Yes |
| Application Design Details | Application Designer | TBD | Yes | Yes | No |
| Batch Design Details | Batch Designer | No | Yes | Yes | No |
| References, Approvals | Application Architect / Designer | Yes | Yes | Yes | Yes |

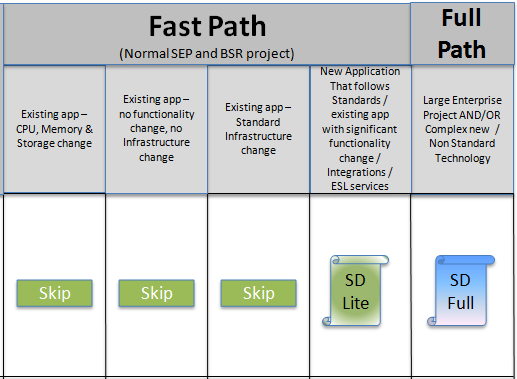
Critical Sections that must be prioritized

The intended audience is the representatives from all impacted areas, including Enterprise Architects, Application Architects, Application Owners, Tech Leads, Infrastructure Architects, and IT security, developers, QA and support.

**Mandatory prior approvals of the SD are listed at the end of the document.**

## When is this artifact required?

Solution Design (SD) document is available in three different versions namely Skip, Lite and Full. An appropriate version suitable for the project will be determined by the Application Architect and Enterprise Architect during PRF/BEG process, based on the nature and complexity of the project. Below diagram shows generic guidelines in the form of swim lanes.

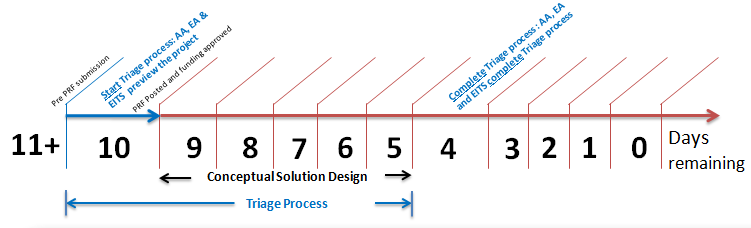


## Which sections are required for Lite version of Solution Design Document and who authors SD?

|  |  |  |  |
| --- | --- | --- | --- |
| **Solution Design (SD) section** | **Required for Lite SD** | **SD Author for most projects** | **SD Author for Complex Enterprise Capability EDAS projects** |
| Project Introduction (Scope etc.) | Yes | Application Architect | Enterprise Architect |
| Architecturally significant requirements & key technical concerns | No | Application Architect | Enterprise Architect |
| Reference Architectures and reusable Design Patterns | No | Application Architect | Enterprise Architect |
| Standards Adherence & Exceptions, Design Risks | Yes | Application Architect | Enterprise Architect |
| Conceptual Solution Design | Yes | Application Architect (Input provided by Solution Architect) | Enterprise Architect |
| Business Architecture | No | Application Architect | Enterprise Architect |
| Information(Data) Architecture | No | Application Architect | Enterprise Architect |
| Component Design | No | Application Architect | Enterprise Architect |
| Integration Matrix | Yes | Application Architect | Enterprise Architect |
| Solution Services Architecture (ESL) | Yes | Enterprise Architect | Enterprise Architect |
| Security Architecture | Yes | Application Architect | Enterprise Architect |
| Mobility Architecture | No | Application Architect | Enterprise Architect |
| References, Approvals | No | Application Architect | Enterprise Architect |

## Who determines what version of SD is needed Skip vs Lite vs Full?

For each LOB-IT area, this determination will be made during the PRF-BEG process by a Triage forum consisting of the Lead Application Architect, the EA Enterprise Portfolio Architect and Account Management team.



## Design guidelines and principles

The Design must be based on [Architecture Principles](http://sharepoint/sites/myArchitecture/Lists/EA%20Principles/AllItems.aspx) and design guidelines some of which are mentioned below

* The design must implement all of the explicit and implicit requirements contained in the requirements document
* The design must be a readable, understandable guide for those who generate code and for those who test and subsequently support the software.
* The design should provide a complete picture of the technology components, addressing the data, functional, and behavioral domains from an implementation perspective.
* A design should exhibit an architecture that (1) has been created using recognizable architectural styles or patterns, (2) is composed of components that exhibit good design characteristics and (3) can be implemented in an evolutionary fashion
* A design should be modular; that is, the software should be logically partitioned into elements or subsystems
* A design should lead to components that exhibit independent functional characteristics.
* A design should lead to interfaces that reduce the complexity of connections between components and with the external environment.
* A design should be derived using a repeatable method that is driven by information obtained during requirements analysis.
* A design should be represented using a notation that effectively communicates its meaning.

# Project Introduction

## Project Description

The Multi-Dose Packaging (MDP) Pharmacy is a prescription fulfilment facility currently located in Virginia. This facility packages a patient’s 30 day supplies of medication into a roll of medication, separating and consolidating each patient’s medications into a morning, afternoon, and evening or bedtime packets. Once a box is assembled, it is shipped to a patient’s home or local store for pick up. Today, the MDP Pharmacy relies on multiple, disconnected systems such as the Care 1-on-1 Relationship Management tool, RxConnect, a shipping terminal and an automated packaging machine, and manual paper processes to manage their patients on a regular basis. This has hindered the pharmacy’s ability to maximize throughput and efficiency. As a result, growth at the MDP Pharmacy is limited due to technology gaps. Additionally, the disconnectedness and manual components increases the overall margin for human error, potentially putting patient safety at risk.

The SimpleDose Application should:

* Simplify the user interface to focus the user on the task at hand, providing quick access to additional information as needed
* Be intuitive and easy to use
* Allow the user to initiate all actions from the application, obtain the most up-to-date information about the prescriptions/fills in each order, and access other applications needed to do the work
* Provide user awareness of where new enrollments or monthly orders are in the process, and support tracking the enrollment and order history
* Solve for the ability to disposition actions being taken and support elimination of notes
* Replace Manual Activities with system-generated Enrollment and Order statuses, and exception scenarios that require intervention
* Drive the work that the colleagues need to complete in the right priority order, and not the other way around
* Provide guidance to the user on what to do for each step

## Business Objectives

Current MDP Pharmacy systems and processes are not conducive to business growth. Implementation of CRM, RxConnect, and automated enhancements will increase pharmacy throughput and enable colleagues to perform their day-to-day responsibilities in a more efficient manner. Additionally, these systematic enhancements will help build a foundation for MDP facility expansion to other sites across the country. Site expansion will increase the MDP footprint, help increase MDP market share and help meet the goal of 5 million prescriptions by 2019. Enhancements will establish standardization in MDP workflow process and increase the speed to stand-up net new sites in subsequent years. Additionally, this foundation will enable the MDP product to evolve and better suit the needs of our patients (improved follow up, self-management capabilities) thus driving patient acquisition and retention.

## Business Benefits

[*http://sharepoint/sites/epms\_projects\_site/R29/Shared%20Documents/01.%20Project%20Management/04%20-%20ITPR025905%20-%20CS%20Multi%20Dose%20Packaging%20and%20RxC%20Integration/Project%20Request%20Form\_MDP%20Enhancements%20for%20Workflow\_vF3*](http://sharepoint/sites/epms_projects_site/R29/Shared%20Documents/01.%20Project%20Management/04%20-%20ITPR025905%20-%20CS%20Multi%20Dose%20Packaging%20and%20RxC%20Integration/Project%20Request%20Form_MDP%20Enhancements%20for%20Workflow_vF3)

## Scope

### Overall scope:

***SDA Phase 1 Objectives: Check-In Functionality***

1. Implement Check-In functionality for MDP Orders is SDA.
2. Ensure SDA application can perform order fulfilment and management of orders.
3. Provide both IT and Maintenance (Business) configurations through UI screens
4. Interact with existing Interfacing systems like RxC, Digital, Eligibility, ROCM etc., to complete Order Fulfillment and Order Management activities.

### Inclusions:

The below functionalites will be delivered by this project:

* Simple Dose Detail
* Disposition MDP Order
* Prescription Information
* Edit Details
* Order History
* Order Fulfilment
* IT Admin Configurations
* Maintenance Configurations
* Order Management (Exceptions)
* Refill Renewal Process
* Systematic Validations
* Reporting
* Data Migration to DW

### Exclusions:

The following items are not in scope for the project. Out of scope items may be considered in a future phase.

* Check Card on File functionality
* Update Card on File functionality

### Considerations for future releases:

* MDP Patient Enrollment – Phase 2
* Purging of ROCM data
* Capacity Model
* DB Sizing

### Open Items

**N/A**

## Assumptions

|  |  |  |
| --- | --- | --- |
| Assumption | Rational | Implications |
| Data Migration needs to be completed prior to SDA Live | This is a pre-requisite for SDA to continue order processing for next month order | Unable to view patient’s orders in SDA  Unable to process patient’s orders. |
| Interface Services – Migration Period approach is different from Phase 2 approach. | External consuming services will not be impacted due to migration of patients from CRM to SDA. | Patients are spread across both CRM and SDA systems and need to be processed seamlessly. |
| External Interfacing systems will come through CRM for Phase 1 and will cut-over to SDA in Phase 2. | Temporary solution for Phase 1 and enterprise solution for Phase 2. | Business continuity during transition/migration phase. |
| ROCM Feed Files –  Partial data will be flowing to ROCM during Phase 1 migration period. After migration phase there will be only 1 feed from SDA to ROCM and no more CRM feed files. | Temporary solution for Phase1 until Phase2 is alive.  Meeting business requirements | Business continuity during transition/migration phase. |
| New patients are on boarded in CRM application only and not in SDA during Migration period. | Enrollment functionality will be implemented in SDA in Phase 2 only. | Business continuity for enrolling new patients during migration phase. |

## Constraints

### Business Constraint

|  |  |  |
| --- | --- | --- |
| Constraint | Source | Date (if applicable) |
| No known constraints |  |  |
|  |  |  |
|  |  |  |

### Regulatory, Legal and Compliance constraints

|  |  |  |
| --- | --- | --- |
| Constraint | Source | Date (if applicable) |
| No known constraints |  |  |
|  |  |  |

# Functional Impact Analysis

This is a new application and the expectation is to re-write existing CRM functionality.

Few functional changes are impacted in SDA like –

* Sync Plan
* Work Basket
* Activities

# Interface Specification

SDA will interact with below Interfacing systems to send/receive required data for MDP order fulfilment activites.

| **Application/Repository** | **Impact** |
| --- | --- |
| RxC | RxConnect system. This is implemented using ESL APIC Platform. |
| RxDW | RxConnect data warehouse system that provide access to patient and order reporting information. |
| Site Minder | Provides authorization for SDA application |
| Care 1 on 1 | Current system for Multi Dose package. Until phase 2 goes live, this application will be the gateway for all Digital services |
| ROCM | For Patient outreach options |
| Digital | All Digital interfaces are part of second phase. Until then Care1 on1 application will be utilized for all digital interfaces. |
| OMS | Order Managemet System for updating order status when the order status changes |
| POS | POS system provides Order status. This status will get updated in SDA system |
| ROCM | ROCM Notifications are sent to ROCM |
| Node JS | Node JS interfaces are used for Card on file and Eligibility engine services |

[**http://sharepoint/sites/CVSEPMS/Architecture%20Stream/Forms/AllItems.aspx?RootFolder=%2fsites%2fCVSEPMS%2fArchitecture%20Stream%2fWorkStream%2fInterface%20Specs%2fRetail%20Supporting%20Apps%20Service%20Specs&FolderCTID=&View=%7bC7979896%2d98B5%2d4759%2d9DA2%2d21ACAF27B31D%7d**](http://sharepoint/sites/CVSEPMS/Architecture%20Stream/Forms/AllItems.aspx?RootFolder=%2fsites%2fCVSEPMS%2fArchitecture%20Stream%2fWorkStream%2fInterface%20Specs%2fRetail%20Supporting%20Apps%20Service%20Specs&FolderCTID=&View=%7bC7979896%2d98B5%2d4759%2d9DA2%2d21ACAF27B31D%7d)

# Architecturally Significant Requirements, Key Technical Concerns

## Link to Requirements Document – Check-In Functionality

<https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/01.%20Requirements/SDA%20New%20App%20Requirements/ITPR039864%20Simpledose%20Application%20Finaldoc0706.docx>

## Link to Requirements Document – Enrollment Functionality

[https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/01.%20Requirements/SDA%20New%20App%20Requirements/ITPR039864%20Simpledose%20Application%20Enrollment%20RequirmentsFinal.docx](https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/01.%20Requirements/SDA%20New%20App%20Requirements/Old%20Copies/ITPR039864%20Simpledose%20Application%20Enrollment%20RequirmentsFinal.docx)

## Architecturally significant Requirements & key technical concerns

|  |  |  |  |
| --- | --- | --- | --- |
| FR/NFR Reference | Requirement | Technical concern | Mitigation |
| *RxC-DBPL-1* | *Real time HTTPS transaction from CRM to DBPL/DOMS retry mechanism.* | *In case of HTTPS transaction failure with DBPL, the xmls would have to be stored in DB for retry mechanism. This will increase DB usage in time of outage as well as transaction volumetric.* |  |
|  |  |  |  |
|  |  |  |  |

## Technology Overview

The following technologies have been chosen for development of the application.

1. Angular 7 – client side framework.
2. Springboot 2.2.6.RELEASE with Spring Framework
3. Maven 3 for build and deployment.
4. Oracle 19c for DB, execute sql statements and stored procedures.
5. Siteminder 12.52.104.2032 – Single Sign-On
6. Java 1.8
7. Apache HTTPD (Web Server)
8. Web Logic - Version 12.2.1.4 (Application Server)
9. GITLAB – Version Control
10. Jenkins – Continuous Integration and Deployment
11. Mozilla Firefox v51 and Google Chrome v67 as the supported browsers for the application.

## Key Decisions

### Key Architecture Decisions

#### KAD1: Connectivity of CRM to Digital service to check for patient’s Auto Fill eligibility.

**Problem Statement**: *How should CRM connect to Digital service which checking for Auto Fill eligibility for patients while accessing patient profile and during add Rx scenarios.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Options** | **Comments** | **Pros** | **Cons** | **Comments** |
| **Option 1**  Access Digital service through DBPL | Consume this service owned by Digital through DBPL | * Aligns with current process of consuming all Digital owned services through DBPL | * Digital is moving away from using DBPL. |  |
| **Option 2**  Access Digital service through Node JS | Digital will be exposing all new/future services through Node JS | * Digital’s new process is to eliminate intermediate orchestration layers. * Migrating to Micro Services based architecture (Containers). * Eliminates DBPL/ESL passthrough layers. * Approved by Enterprise Architecture Team | * Requires changes/validations (Related to Firewall etc., due to new interface point) |  |

**Recommendation:** Option 2 is recommended, based on above Pros/Cons and new model/process to eliminate orchestration layers.

#### KAD2: Sending messaging data to ROCM through batch for Order Processed and Scheduled scenarios.

**Problem Statement**: *How should CRM send messaging notification data to ROCM for order prepared and order scheduled scenarios.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Options** | **Comments** | **Pros** | **Cons** | **Comments** |
| **Option 1**  Combine data for both scenarios into single file and send to ROCM | Combine all data related to order management into single file. | * Single batch job that will execute multiple queries to extract data for both scenarios. | * Longer execution time to perform multiple queries * Batch execution time will increase in future as volume increases * Additional processing time required when attributes are not the same for both scenarios |  |
| **Option 2**  Create separate files for each scenario and send separate files to ROCM | Separate file for each scenario. | * Separate files for each scenario * Change in attibutes will only impact associated scenario * Less impact to each batch job due to volume increases in future * Testing impact – Testing is only required for impacted scenario (If changes are required for one scenario Vs. both scenarios) | * Single Vs. Multiple files to ROCM. |  |

**Recommendation:** Option 2 is recommended, based on above Pros/Cons.

#### KAD3: Reduce Auto Fill eligibility calls from CRM to Eligibility engine to check patient’s eligibility for multiple scenarios.

**Problem Statement**: *How should CRM minimize calls to Eligibiity engine and utilize persistence in CRM DB when a patient’s eligibility does not change in 24 hrs.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Options** | **Comments** | **Pros** | **Cons** | **Comments** |
| **Option 1**  Perform an AF eligibility call for all required scenarios | Make a call to eligibility engine to check AF eligibility for all required scenarios and display on screen. | * Calls eligibility engine in Real Time and display on screen. * No persistence in CRM DB. | * Very high volume of eligibility calls from CRM to eligibility * Duplicate/Redundant eligibility calls being performed when data/eligibility criteria is not changing. * High impact to both systems (CRM/Eligibility Enigne) as volume increase in future will have an impact on network/system resources etc., |  |
| **Option 2**  Persist eligibility data in CRM DB after 1st call and utilize cache/local DB call instead of additional eligibility calls | Perform 1 call per day and persist data in CRM DB.  Utilize cache data when switching thorugh patient profiles or perform local DB call if data is not availale in cache. | * Volume - Reduce total no of eligibility calls * Avoid redundant/duplicate calls to eligibility engine * Utilize persistence of eligibility data in CRM DB to avoid additional calls to eligibility engine * Use cache mechanism to minimize DB calls . * Utilize data from cache when available else perform local DB call. If data is older then 24hrs then call eligibility engine and persist for 24 hrs. | * Requires changes to implement validation checks (cache/DB) | AF eligibility data does not change through-out the day. |

**Recommendation:** Option 2 is recommended, based on above Pros/Cons.

#### KAD4: Mechanism for caching data in SDA.

**Problem Statement**: *How should CRM manage to perform looks-ups for master data/configurations.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Options** | **Comments** | **Pros** | **Cons** | **Comments** |
| **Option 1**  Use DB look-up for master data configurations | Look up master data from DB tables. | * Single source of master data * No third party or JVM cache required | * Impact to DB I/O * Latency when compared to Cache look-ups * Increased network traffic |  |
| **Option 2**  JVM cache mechanism | SDA retrieves most data real-time from RxConnect. Currently there is no need for cache for static data. For caching small amounts of data, JVM cache mechanism is sufficient. | * Reduce database overhead and I/O * Reduce latency to perform look-ups * Faster look-ups through memory Vs. DB call * Reduced network traffic | * Cache must be configured and maintained * Framework needed to purge /refresh when master data is changed | No use case in SDA for Phase 1 |

**Recommendation:** Option 2 is recommended, based on above Pros/Cons.

# Reference Architectures and Reusable Design Patterns

## Reference Architectures used

|  |  |  |
| --- | --- | --- |
| Reference Architecture | Description | Link to EA SharePoint |
| Database | Reference Arch for Database | <http://sharepoint/sites/myArchitecture/reference/Reference%20Architecture%20Wiki/Database%20Server%20Reference%20Architecture.aspx> |

## Design patterns identified for modularization and reusability

*< List Design Patterns provided in this document that can be packaged for future reusability>*

|  |  |
| --- | --- |
| Reusable Design Pattern | Description |
| N/A |  |

# Standards Adherence and Exceptions

## Approved Standards adhered for newly introduced technologies

|  |  |  |
| --- | --- | --- |
| Approved Standard | Version | Notes |
| N/A |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## Standards NOT adhered for newly introduced technologies

|  |  |  |  |
| --- | --- | --- | --- |
| Standard NOT adhered | Justification | URL Link to EA SharePoint exception request | Status (approved/in review/rejected) |
| N/A |  |  |  |
|  |  |  |  |

## Design Risks and mitigation strategy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Area | Risk | Risk level (critical/high/medium/low) | Mitigation strategy | Link to EA SharePoint exception request |
|  |  |  |  |  |

# Conceptual Solution Design

## Conceptual Solution Model

<https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/02.%20Design/APIC%20Migration/SD/ITPR039864%20MDP%20%E2%80%93%20Simple%20Dose%20Application%20Solution%20Diagrams%20V1(1).vsdx>

The above context diagram gives an overview of the systems interacting with SDA thorugh ESL as either service provider/consumer.

## Solution Overview

### High Level Architecture



The services exposed by the SDA application are not available over the web. They are only available within the CVS network. Spring components have been leveraged for RESTful services creation.

### High Level UI Architecture



### High Level Physical Architecture



The above diagram provides the physical architecture of the application. The critical item to note is the interaction with RxConnect. There are two modes of interation with RxConnet. The first is via ESL and the second one is direct( required for POS Patient search)

### High Level Logical Architecture



# Business Architecture

N/A

## Business Capabilities supported/enabled by this design

N/A

### Impact to Application Architecture Components

## Use Case View

### Business Use Case

N/A

### Technical Use Case

#### CRM to SDA Transformation



Link to document - <https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/02.%20Design/SD%20Document/CRMTransformationFlow.vsd>

Below list of services will be impacted in Phase 1 where CRM will be the consumer calling SDA through ESL APIC.

1. submitMDPForm
2. receiveMDPOrderMaintenance
3. getMDPOrderDetail
4. updateMDPOrderStatus
5. digitalMaintenance
6. getMDPOrderDetail (DigitalDashBoard - New Heh API v2)

#### Pre-Conditions

All Inbound requests coming from Digital, RxC and POS systems will come through ESL Legacy and CRM will perform the check to validate if patient has been migrated to SDA.

#### UC1 – Scenario 1 (Normal)

If patient has not been migrated to SDA then CRM will process the incoming request as existing functionality and respond back to ESL.

#### UC1 – Scenario 2 (Normal)

If patient has been migrated to SDA then CRM will transform the incoming legacy service contract to new APIC service contract and call ESL APIC datapaower. After SDA processed the request and response is recived from ESL APIC to CRM, CRM will transform APIC contract back to legacy contract and send the response to ESL Legacy data power.

#### UC1 – Scenario 3 (Exception)

| **Exception** | **Description** | **Handling** |
| --- | --- | --- |
| Functional Exceptions | SDA exceptions to be sent to consumer(s) | CRM will transform all functional exceptions sent by SDA to legacy services contracts and send them to consumers. |
| Non-Functional Exceptions | CRM time-out or no response from SDA/ESL platforms. | Return an error code and description to consumer indicating unable to process. |

# Solution Information(Data) Architecture

## Data flow diagram

Patient Enrollment Flow –



Check-In Order Flow –



## Data Entity / Data Component catalog

|  |  |  |
| --- | --- | --- |
| Data Entity | System of Record | Describe how data is managed for this entity. E.g. maintained locally? |
| Patient Info | RxC | RxC/Maintained locally |
| Caregiver Info | RxC | RxC/Maintained locally |
| Enrollment Info | SDA | Maintained locally |
| Prescription Info | RxC | RxC/Maintained locally |
| MDP Order Info | SDA | Maintained locally |

# Data Model

## Data Model

<https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/02.%20Design/Database/SDA_Data_Model_New.xlsx>

# Component Design

## Logical Solution Design Detail



## Logical Solution Design Detail

* The application will function in an Active/Passive Disaster Recovery configuration.
* The East data center will be the default Active site.
* Web Traffic shall be balanced across two Tomcat Servers.
* There will be two database servers per Approved Tier 1 Architecture standards.
* The site running in either data center will call the ESL running in the West.

## Infrastructure Requirements

### HA/DR

* Disaster Recovery (DR) Tier 1A.
* The prod environment is in RI.
* The DR environment is in Shea and is an active/passive configuration.
* DR web/application VMs are in the Shea network. The OS is managed and patched by the Unix team. The application team is responsible for keeping the application software in sync with prod.
* DR database servers are in the Shea network. The OS is managed and patched by the Unix team. Oracle Dataguard replication is used for replicating the prod database servers in 2100 to the DR database servers in Shea.

### Backup/Archival

* Prod servers in 1CVS, RI. DR at Shea, AZ. Tier 1A.
* Test/Dev servers are in 2100.
* PT servers split between 1CVS and 2100, need backups replicated to Shea for DR.
* Standard Backup and Archive processes to be followed per tier 1, using TSM and DDBoost at 1CVS, AZ with backup replication to the Shea, AZ location for DR.
* Dev/SIT/Test servers in 2100 do not require Filesystem or DB backup replication for DR recovery.
* Isilon backups are managed by the storage team.

# Integration Matrix

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source System/ Component | Destination System/ Component | Integration Technology (HTTPs, sFTP, etc) | If Transits Firewall, Outbound Ports | If Transits Firewall, Inbound Ports | Type (batch, on-demand, OLTP, etc.) |
| SDA Angular7 UI | SDA Server | HTTPs |  |  | OLTP |
| SDA Server | ESL | HTTPs |  |  | OLTP |
| SDA Server | Siteminder | HTTPs |  |  | Authentication |
| SDA Server | Digital DBPL | HTTPs |  |  | OLTP |
| SDA Server | Digital | sFTP |  |  | batch |
| SDA Server | Digital/DEP | HTTPs |  |  | OLTP (Node JS) |

Are all file transfer protocols for the entire system, both new components as well as any existing, listed in the table above? \_X\_ Yes \_\_\_ No (if no, indicate why or list existing components not covered):

* File transfers must be via secure protocols only (e.g SFTP or FTP/S) using approved algorithm and key size listed in CIST-0111.
* All new inbound communications for SDA application should be 2 way SSL with TLS1.2.
* All new outbound integrations with APIc should be 1 way SSL with O-Auth. TLS 1.2 should be used for the SSL Encryption.
* RxConnect will call the Event Notification Framework API over https with 1 way SSL passing a token received from the Token Service.
* The token service implements OAuth2.0 authorization using the providedClient ID and Client Secret when submitting any of the methods of the ESL getDoseCalendarService service.
* This application and file feeds will contain PII and PHI data only. No PCI data will be captured.

# Solution Services Architecture

## Candidates for Service Enablement

This section captures the list of capabilities, integration points and requirements for data exchange which are necessary to support the conceptual end to end solution.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Functional Area** | **Capability** | **Key Data Entities** | **Rules or Policy** | **Provider** |
|  |  |  |  |  |

## Identified Services

This section captures the output from the Service Identification process carried out to determine the appropriate Services to meet the requirements for the end to end solution.

No new services are being deployed as part of this migration project. All services that are migrated are existing services used by CRM system.

## Service Detail :: N/A

### Context

### Service Dependencies

### Messages

### Logic

### Services Non Functional Requirements

The following section details the non-functional requirements for the services and operations supporting the solution.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Operation | Availability | Operational Window (normal & peak) | Response Time | Throughput |
| processServiceRequest | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 1 TPS*  *Max: 1 TPS* |
| getRxFillStatusDetails | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 4 TPS*  *Max: 10 TPS* |
| getSubmitRxRefill | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 4 TPS*  *Max: 10 TPS* |
| processRenewal | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 4 TPS*  *Max: 10 TPS* |
| getPatientProfile | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 4 TPS*  *Max: 10 TPS* |
| getPatientRxProfile | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1.5 sec*  *Max: 2.5 sec* | *Avg: < 4 TPS*  *Max: 10 TPS* |
| getRxAttributes | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 4 TPS*  *Max: 10 TPS* |
| submitMDPForm | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 1 TPS*  *Max: 1 TPS* |
| receiveMDPOrderMaintenance | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 1 TPS*  *Max: 1 TPS* |
| getMDPOrderDetail | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 1 TPS*  *Max: 1 TPS* |
| updateMDPOrderStatus | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 1 TPS*  *Max: 1 TPS* |
| digitalMaintenance | *99.9%* | *Norm: 24\*7*  *Peak: 10am – 3pm* | *Avg: <1 sec*  *Max: 1.5 sec* | *Avg: < 1 TPS*  *Max: 1 TPS* |

# Batch Details

## Impacted batch Details

List and details of all new and existing batches impacted as part of this project are provided in attached sheet.

[CRM Batch Details](https://collab.corp.cvscaremark.com/sites/EntperpriseDigital3/Agile_Transformation/ARTs/OMT/CRM/_layouts/15/DocIdRedir.aspx?ID=SSSFYRCE7TP5-205407915-424)

[SDA Batch Details](https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/02.%20Design/SD%20Document/Batch%20Details_SDA.xlsx?web=1)

# Security Architecture

* Security Risk Assessment (ITPR39864 SDA):

[Link to the SRA](https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/02.%20Design/SRA%20Documents/Security%20Risk%20Advisory%20Assessment%20-%20ITPR039864.pdf?d=w95707b9db2204cb8aaa80dfb8c6d7202)

* Security Risk Assessment (ITPR37997 Infra):

[Link to the SRA](http://sharepoint/sites/IT/IDP/IPD_Document_Library/Project_Documents/ITPR037997%20-%20MDP%20OMS%20Environment/SRA-ITPR037997.docx)

## Security Design

**Project Requirements:**

* File transfers must be via secure protocols only (e.g SFTP or FTP/S) using approved algorithm and key size listed in CIST-0111.
* All new inbound communications for SDA application should be 2 way SSL with TLS1.2.
* All new outbound integrations with APIc should be 1 way SSL with O-Auth. TLS 1.2 should be used for the SSL Encryption.
* SDA will call the Event Notification Framework API over https with 1 way SSL passing a token received from the Token Service.
* The token service implements OAuth2.0 authorization using the providedClient ID and Client Secret when submitting any of the methods of the ESL getDoseCalendarService service.
* This application and file feeds will contain PII and PHI data only. No PCI data will be captured.

|  |  |
| --- | --- |
| **Regulatory Compliance** | **Designation** |
| **PHI (HIPAA)** | Yes |
| **PII** | Yes |
| **PCI** | No |
| **PCI Subnet** | No |
| **PCI Security Tool** | No |
| **PCI Connected** | No |
| **SOX** | No |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Control**  **Requirements** | **Regulatory Compliance** | | | | | |
| **PHI (HIPAA)** | **PII** | **PCI 1A** | **PCI Connected** | **PCI Security Tool** | **SOX** |
| **System Logging** | Yes | Yes | Yes | Yes | Yes | Yes |
| **Privilege User Command Monitoring** | No | No | Yes | Yes | Yes | No |
| **File integrity Monitoring (OS)** | No | No | Yes | Yes | Yes | Yes |
| **File integrity Monitoring (App)** | No | No | Yes | No | Yes | Yes |
| **Application Logging** | Yes | Yes | Yes | Yes | Yes | Yes |
| **Two-Factor Authentication** | No | No | Yes | Yes | Yes | No |
| **Database Activity Monitoring** | Yes | Yes | Yes | No | No | Yes |
| **Data Loss Prevention** | Yes | Yes | Yes | Yes | Yes | Yes |

| **Control** | **Constraints** | **Solution** | **Notes** |
| --- | --- | --- | --- |
| **System Logging** | UNIX | Splunk (syslog) |  |
| Windows | Splunk (EventLog) |
| Network Appliances | Splunk (syslog) |
| Other | Splunk (syslog) |
| **Privilege User Command Monitoring** | UNIX | Splunk (agent) | . |
| Other | N/A | This requirement only currently applies to UNIX devices. |
| **File Integrity Monitoring (OS)** | Windows | N/A |  |
| UNIX / Linux |  |  |
| **File Integrity Monitoring (App)** | Windows | N/A |  |
| UNIX / Linux | N/A |  |
| **Application Logging** | All | Splunk |  |
| **Two-Factor Authentication** | UNIX | All accounts are maintained locally on servers. |  |
|  |  |  |
| **Database Activity Monitoring** | Oracle / UNIX | Guardium |  |
| Other |  |  |
| **Data Loss Prevention** |  |  | N/A |

# Mobility Architecture

## Mobility Architecture Overview for Mobile Web / Native App

N/A

## Presentation Layer Components and Design

N/A

## Business Logic Layer Design

N/A

## Data Access Layer Design

N/A

## Security Design

N/A

# Miscellaneous Design Considerations

## Architecture Implementation Guidelines

* *Any new web service should be decided to be SOAP or REST based on its need, usage and extensibility. Care should be taking in making service/operation generic for future usage.*
* *Any change to a service / operation provided by other system should be backward compatible. Review the interface specs/design document shared by the provider system to confirm this or raise feedback on the same.*
* *Propose using SFTP server for transferring files across systems (e.g., to/from Digital).*
* *For any new inclusion/exclusion list, check if it is required to be overridden at lower levels, else recommend to have it at only root level. Additionally recommend to disable the overridden feature for such inlusion/exclusion lists*
* *Batch Guideline document -* [*http://sharepoint/sites/CVSEPMS/Architecture%20Stream/Guidelines/Batch\_Guidelines.xlsx*](http://sharepoint/sites/CVSEPMS/Architecture%20Stream/Guidelines/Batch_Guidelines.xlsx)

## Checking AF eligibility and storing results

### RxConnect calling Digital/DEP for checking AF eligibiity

SDA will call Digital/DEP for checking patient’s AF eligibility status and will display the status on UI screen. SDA will also store these results in SDA DB for future requests upto 24 hrs. Since TP eligibility doesn’t change in 24 hrs, SDA will retain this data and avoid additional calls to Digital/DEP for fetching same data.

### AF eligibility data – Check for this data in local session and SDA DB prior to calling Digital/DEP

When AF eligibility status needs to be displayed on UI screen or a request is initiated for AF check, SDA will first check in local session if data is available from prior call else look up in SDA DB. If data in SDA DB is less then 24 hrs then data will be fetched from DB and there is no need to make a service call to Digital/DEP.

If AF status data is not available in session and data in SDA DB is older than 24 hrs or there is no AF status data for this patient in SDA DB, then SDA will intitate a new service call to Digital/DEP to perform AF status check and store data in both SDA DB and local session.

## GCNSEQNo Check When Patient’s First MDP Order Is Changed Since the Sync Plan Was Last Approved

### Approved Sync Plan

* When a patient’s Sync Plan is approved, capture the details (e.g, CSSD, drug name, drug GCNSEQNo, retained for next order status, delivery preference, Sync Plan approved date, last updated date, etc.) in audit tables (Order, Prescription) with the date the Sync Plan is approved.
  + In addition to the order details, the audit table should contain attributes that will be updated by the SDA batch (see section [**18.3.2**](#_Batch_for_new)). These attributes (e.g., *ROCM Notification* = ‘SENT’, date outreach notification is sent, etc.) should NOT be updated at time of Sync Plan approval.
* Architecture recommendation is to capture the full table of attributes in the audit table. (Note: a design alternative can be to store only the attributes required within the same database table to perform the GCNSEQNo check comparisons).

### Batch for new event type ‘SYNC-PLAN’ (when first Order has changed since Sync Plan approved)

* Batch to perform GCNSEQNo check comparisons during batch file preparation of notification requests for first MDP order submission.
  + Batch to determine if any of the information is changed since the time the Sync Plan was last approved.
  + When a notification is to be sent, batch is to update the notification attributes in the audit table (e.g., *ROCM Notification* = ‘SENT’, date outreach notification is sent, etc.)
* When fetching the details from the audit table to perform comparison checks, the system must sort the rows by order of last Sync Plan approved date and select the details to use for comparison from the most recent Sync Plan approved date.

## GCNSEQNo Check When Patient’s Order Changed Since It Was Approved Digitally

### Order Approved Digitally

* When a patient’s Order is approved digitally, capture the details (e.g, CSSD, drug name, drug GCNSEQNo, retained for next order status, delivery preference, Order approved date, , last updated date etc.) in audit tables (Order, Prescription) with the date the Order is digitally approved. If Order is edited and digitally approved again, capture all details in audit tables (Order, Prescription) again with the new date the Order is digitally approved.
  + In addition to the order details, the audit table should contain attributes that will be updated by the SDA batch (see section [**18.4.2**](#_Batch_for_new_1)). These attributes (e.g., *ROCM Notification* = ‘SENT’, date outreach notification is sent, etc.) should NOT be updated at time when Order is digitally approved.
* Architecture recommendation is to capture the full table of attributes in the audit table. (Note: a design alternative can be to store only the attributes required within the same database table to perform the GCNSEQNo check comparisons).

### Batch for new event type ‘ORDER CHANGE’ (when submitted order changed since it was approved digitally)

* Batch to perform GCNSEQNo check comparisons during batch file preparation of notification requests for MDP order submission.
* Batch to determine if any of the information is changed since the time the Sync Plan was last approved.
* When a notification is to be sent, batch is to update the notification attributes in the audit table (e.g., *ROCM Notification* = ‘SENT’, date outreach notification is sent, etc.)
* When fetching the details from the audit table to perform comparison checks, the system must sort the rows by order of last Order digitally approved date and select the details to use for comparison from the most recent Digitally approved date.

## Audit Tables Purge

### Batch Purge

* A batch job should be created to purge the records that have been processed and notifications sent (e.g., *ROCM Notification* = ‘SENT’) so system performance does not degrade.
* Purge records after X days.

## Batch SubmitMDPOrder Retry Design

### CRM sendMDPOrder service - Add failed transaction to DB table for batch retry:

* After transaction failure/error response when attempting to send a submitMDPOrder transaction to Digital OCS (via DBPL), the CRM system should retry X number of times after X milliseconds in between retry attempts (service number of retries – default 3, and seconds to wait inbetween retries – default 2000 milliseconds. Both are configurable).
* After attempting max number of retires, then CRM system should interegate the last failed transaction response.
  + Only transactions with error codes that indicate transaction can be retried should be added to the failed transaction DB table.

### CRM Order Edits:

* After any edits to a submitted order, CRM system should check and remove any transaction from the failed transaction DB table. A new submitMDPOrder transaction should be created and processed (current MDP Order edit logic).

### Retry batch job – retry failed transactions:

* Batch job will be passed some parameters through Control M. These parameters consist of:
  + Max duration for the records to be processed. Default is 1 hour(s).
  + Max number of batch retries for failed message. Default is 3 retries.
  + Max number of records to be processed per execution. Default 300 number of records. (Note: Log an informational message in batch log if number of retry records in DB exceed maximum number of records limit).
  + Max number of threads. Default 1 number of threads.
* Retry Batch job will be running at the interval of X hours (default 1 hour(s)). This frequency should be configurable.
* Batch execution will happen on batch server and will process all failed transaction that were last attempted after X hour(s) or more has lapsed.
* Batch will increment the retry count for each transaction retry attempt.
* Batch will fetch the records based on eligibility which is – transaction record has less number of retries than max number of retries which is passed from control M (default 3 retries).
* The record list will be sorted based on created date. The oldest record will be processed first.
* If this list size if greater than max number of records to be processed per batch execution (default 300 records) then only maximum number of records configured through Control M will be processed.
* New thread pool will process records from this list one record per thread at a time.
* Thread pool size will be calculated based on maximum number of threads allowed, which is max number of threads configure through Control M (default 1 threads).
* CRM OLTP DB table used for failed DIGITAL OMS messages. CRM OLTP DB is primary location to store these messages.
* 1 sequence object will be created for this table in CRM OLTP and will be used to insert new records in CRM OLTP DB table.
* The messages which are in CRM OLTP DB table will be processed and updated through retry batch.
* Batch will pick the oldest records first for retrying these with DBPL/DOMS. The records will be picked till last X hour(s) only (default 1 hour(s)).
* Batch job will pick the only primary keys of the failed records.
* Batch will read the JSON/XML and send it to DIGITAL OMS through CRM and DBPL.
* Batch will trigger CRM sendMDPOrder service to process these messages and update transaction status and number of retry details to CRM OLTP DB table.
* In case retry fails for a transaction in batch execution, the retry counter in DB will be incremented by 1 and the same record will be retried again in next batch iteration after X hour(s) (default 1 hour(s)).
* Max record per execution will determine the max number of records to be processed in one batch execution.



[Batch Retry Design](https://collab.corp.cvscaremark.com/sites/EntperpriseDigital3/Agile_Transformation/ARTs/OMT/CRM/_layouts/15/DocIdRedir.aspx?ID=SSSFYRCE7TP5-205407915-95)

## Data Migration Design – Managing patient migration status.

1. Add new columns MIGRATION\_STATUS, MIGRATED\_DATE to existing table CRM\_PATIENT
2. The column MIGRATION\_STATUS will have 3 domain values
   * Ready – This will be performed daily during Data Migration phase based on input criteria (RxC Patient ID’s, Order Completion Date logic – Combination of Sys Date & throttle limit; Combination of Sys Date, Previous Days (Sys Date minus up to 7 days) and throttle limit.)
     + Scenario 1 (Business provides RxC Patient ID’s) – CRM will extract patient id’s from excel sheet provided by Business and validate if last order is in Completed/Picked-Up state within sys-date minus 7 days. For patients that pass this criteria, this value will be updated to ‘Ready’ and migration queries will be executed for these records only and sent to SDA. For patients that have Completed/Picked-up date greater than 7 days, CRM will create an entry in Error table indicating Order Completion date is greater than 7 days.
     + Scenario 2 (Control-M parms - Order Completed/Picked-Up Date as Sys Date, Previous Days (Value could be 0 thru 7 days only) & Throttle Limit combination) – CRM will query for patients whose Order Completion/Picked-Up date is within Sys-Date minus Previous Days date and select no of records based on sort order (Date/Time-Stamp) and mark them as ‘Ready’. If throttle limit is specified then no of records selected with be based on throttle value else all records within this date range will be processed.
     + Batch should never change the domain value to ‘Ready’ when the status is already in ‘Complete’ state.
     + For re-running of error records, the data will be provided to Business for data-fix and upon completion of data-fix Business would provide RXC\_PATIENT\_ID through Scenario 1 for migration to SDA. (CRM will update the MIGRATION\_STATUS to ‘Ready’ for these errored records after performing validation checks)
   * Complete – When below checks are successful then domain value will be marked as ‘Complete’ i.e. Patient has been migrated to SDA.
     + CRM Migration Validation/Query errors – No Data for patient etc.,, Transformation, DB Constraint exceptions etc.,
     + Pre-Validation checks from SDA – Need a list of mandatory tables and columns required for this check
     + Writing to Feed Files is complete
   * Error – This will be marked as ‘Error’ when errors are encountered in above 3 steps
     + An Error Table will be created to capture all details
     + Error table will contain Patient Id, Exception Type (Query/Validation/Writing to feed file) and Date Executed of Exception Description
3. **Assumptions** –

* Combination of Sys Date, Previous Days & Throttle Limit: This will be Control-M parms and will be changed as required during migration phase.
* Order Completion/Picked Up Date Criteria – For Scenario 1, CRM will pick patients whose previous order **completion date is with-in sys-date minus 7 days only** else mark as error and skipped from migration list.
* The date check is assumed to be before mid-night. If batch runs after mid-night then batch will have to adjust this date to be Sys Date minus 1 (example – if migration batch runs on same days then it will be Sys-Date else if batch runs after mid-night then it will be Sys-Date minus 1).
* Team will be monitoring the migration status of patients/jobs/data on daily basis through-out the migration phase to resolve exceptions on daily basis.

# Capacity View

## Volumetric Details

<https://collab.corp.cvscaremark.com/sites/EntperpriseDigital3/Agile_Transformation/ARTs/OMT/CRM/_layouts/15/DocIdRedir.aspx?ID=SSSFYRCE7TP5-205407915-37>

## DB Sizing (Storage)

Identify the impact of new columns and tables, indexes to overall DB sizing

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tier** | **Go-Live 2018 (TB)** | **Go-Live + 1 yr (TB)** | **Go-Live + 2 yr (TB)** | **Go-Live + 3 yr (TB)** |
| N/A |  |  |  |  |

N/A - Future

## Batch Server Sizing

[SDA Batch Server Sizing](https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/02.%20Design/SD%20Document/SDA_Batch%20Server%20Sizing.xlsx)

# Logging and Monitoring

## Logging

* For all new services, logging should be done properly.
* Log the following for any exception:
* Step at which it occurred, that is, at which service
* Timestamp of the exception
* Exception reason with primary keys, for example, Facility Id, Rx id etc. No PHI/PII data to be logged.
* All exceptions to be logged with log level as error.
* Complete Exception Stack Trace needs to be logged.
* Follow the logging guideline as below for other logging.

<http://sharepoint/sites/CVSEPMS/Architecture%20Stream/Guidelines/Monitoring%20and%20Logging%20SD%20Guidelines.xlsx>



## Monitoring

### App Monitoring Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **Application Monitoring** | **Descriptions** | **Does the application have this component? (Yes/No)** | **Count** |
| Web Tier | URL Monitoring (Metrics, Availability, Performance) | Yes | 2 |
| Database | Database Monitoring (e.g. Oracle DB) | Yes | 2 |
| Middleware Components | e.g JMX,Web Services, and DataPower Monitoring | No | 2 |
| LogFile | LogFile monitoring of an application with content match | No | 1 |
| Other | e.g Service, Process, Port, Script,and MQ | No |  |
| **Application Deep Dive Monitoring** | **Descriptions** |  |  |
| Application Synthetic Transaction Monitoring (BPM) | Active Transaction Monitoring to identify Availability and Performance issues of an application before they affect users. | Yes | 2 |
| Real User Monitoring (RUM) | Real Time Monitoring,  monitors the performance and availability of business-critical application services for all users at all locations all the time | No |  |
| JVM Monitoring | Application deep dive JVM Monitoring | Yes | 2 |

### Infra Monitoring Requirements

N/A

# Non-Functional View

|  |  |  |
| --- | --- | --- |
| ID | Category | Description |
| NFR\_APIC\_01 | Performance | **Service: getPatientProfile**  Description: This service is used for fetching patient details from RxC  The response time for this service should not take more than **300 msec** for **90%** of the cases.  Current Volumes – **1 TPS** (**7K** daily volume)  Go-Live + 3yr Volumes –   * Average - **2.5 TPS** (210K daily volume) * Peak - **11.6 TPS** |
| NFR\_APIC\_02 | Performance | **Service: getPatientRxProfile**  Description: This service is used for fetching all prescriptions of a patient from RxC.  The response time for this service should not take more than **2700 msec** for **90%** of the cases.  Current Volumes – **4 TPS** (**135K** daily Volume)  Go-Live + 3yr Volumes –   * Average - **46 TPS** (4M Daily Volume) * Peak - **222 TPS** |
| NFR\_APIC\_03 | Performance | **Service: getPatientByDemographicInformation**  Description: This service is used for looking up a patient by demographic details (First Name, Last Name DOB etc.,) with EPH.  The response time for this service should not take more than **1000 msec** for **90%** of the cases.  Current Volume – 1 TPS (100 daily volume)  Go-Live + 3Yr volume-   * Average – 1 TPS (130 daily volume) * Peak – 1 TPS |
| NFR\_APIC\_04 | Performance | **Service: processServiceRequest**  Description: This service is for submitting requests from Store |
| NFR\_APIC\_05 | Performance | **Service: getRxFillStatusDetails**  Description: This service is for fetching fill status details for fill# from RxC.  The response time for this service should not take more than **100 msec** for **90%** of the cases.  Current Volumes – **4 TPS** (**160K** daily Volume)  Go-Live + 3yr Volumes –   * Average - **55 TPS** (4.8M Daily Volume) * Peak - **265 TPS** |
| NFR\_APIC\_06 | Performance | **Service: getSubmitRxRefill**  Description: This service is for submitting a Refill request to RxC when fills have reached zero.  The response time for this service should not take more than **100 msec** for **90%** of the cases.  Current Volumes – 1 TPS (2.6K daily Volume)  Go-Live + 3yr Volumes –   * Average – 1.4 TPS (120K daily volume) * Peak – **3 TPS** (Batch job window for 7PM – 7AM) |
| NFR\_APIC\_07 | Performance | **Service: processRenewal**  Description: This service is for submitting a Refill Authorization to a Prescriber through RxC.  The response time for this service should not take more than **500 msec** for **90%** of the cases.  Current Volumes – 1 TPS (110 daily Volume)  Go-Live + 3yr Volumes –   * Average – 1 TPS (5K daily volume) * Peak – 1 TPS (Batch job window for 7PM – 7AM) |
| NFR\_APIC\_08 | Performance | **Service: mdpOrder**  Description: This service is for submitting order details from Digital to CRM/SDA  Response time for this service should not be more than 1500 msec each request for 12.5 TPS (450K daily volume) |
| NFR\_APIC\_09 | Performance | **Service: receiveMDPOrderMaintenance**  Description: This service is for submitting order maintenance details from Digital to CRM/SDA  Response time for this service should not be more than **1200 msec** each request for **90%** of the cases.  Current Volume – 1 TPS (90 daily volume)  Go-Live +3Yr Volume -   * Average – 1 TPS (2.6K daily volume) * Peak – 1 TPS |
| NFR\_APIC\_10 | Performance | **Service: submitMDPForm**  Description: This service is for submitting patient and prescription details during enrollment phase from Digital to CRM/SDA  Response time for this service should not be more than **400 msec** each request for **90%** of the cases.  Current Volume – 1 TPS (665 daily volume)  Go-Live + 3Yr Volume –   * Average – 1 TPS (19.6K daily volume) * Peak – 1 TPS |
| NFR\_APIC\_11 | Performance | **Service: getMDPOrderDetail**  Description: This service is used by RxC to fetch MDP Order details from CRM using barcode details of MDP Order  Response time for this service should not be more than **450 msec** each request for **90%** of the cases.  Current Volume – 1 TPS (403 daily volume)  Go-Live + 3Yr Volume –   * Average – 1 TPS (11.8K daily volume) * Peak – 1 TPS |
| NFR\_APIC\_12 | Performance | **Service: updateMDPOrderStatus**  Description: This service is used by POS to update CRM that a ship to store order has been picked up by patient at store.  Response time for this service should not be more than **1500 msec** each request for **90%** of the cases.  Current Volume – 1 TPS (300 daily volume)  Go-Live + 3Yr Volume –   * Average – 1 TPS (8.8K daily volume) * Peak – 1 TPS |
| NFR\_APIC\_13 | Performance | **Service: patientSimpleDoseEnroll**  Description: This service is used by CRM to send MDP enrollment indicator for patients to RxC.  Response time for this service should not be more than **300 msec** each request for **90%** of the cases.  Current Volume – 1 TPS (2.4K daily volume)  Go-Live + 3Yr Volume –   * Average – 1 TPS (72K daily volume) * Peak – 1 TPS |
| NFR\_APIC\_14 | Performance | **Service: digitalMaintenance**  Description: This service is used by Digital to send patient email details to CRM/SDA. An email is required for CRM/SDA to communicate with patient for AF and Order related alerts/communicatins.  Response time for this service should not be more than **300 msec** for **90%** of the cases.  Current Volume – 1 TPS (2.4K daily volume)  Go-Live + 3Yr Volume –   * Average – 1 TPS (72K daily volume)   Peak – 1 TPS |
| NFR\_APIC\_15 | Performance | **Service: submitMdpOrder**  Description: This service is used by CRM/SDA to send approved order details to OMS through DBPL.  Response time for this service should not be more than **300 msec** for **90%** of the cases.  Current Volume – 1 TPS (700 daily volume)  Go-Live + 3Yr Volume –   * Average – 1 TPS (18K daily volume)   Peak – 1 TPS |
| NFR\_APIC\_16 | Performance | **New Batch: Order Scheduled Trigger**  Description: This daily batch is used by SDA to extract all orders that are 21 days prior to Current Script Start Date and send email notifications to patients. SDA will send this data to ROCM and ROCM loads this data and sends to Patient Out Reach team.  Response time for this batch should not be more than **60 sec** for **90%** of the cases.  Current Volume – 60 records/day  Go-Live + 3Yr Volume –   * Average – 420 records/day (Batch completion time should be under 7 minutes)   Peak – 600 records/day (Batch completion time should be under 10 minutes) |
| NFR\_APIC\_17 | Performance | **New Batch: Order Prepared Trigger**  Description: This daily batch is used by SDA to extract all orders that are 10 days prior to Current Script Start Date and send email notifications to patients. SDA will send this data to ROCM and ROCM loads this data and sends to Patient Out Reach team.  Response time for this batch should not be more than **70 sec** for **90%** of the cases.  Current Volume – 60 records/day  Go-Live + 3Yr Volume –   * Average – 420 records/day (Batch completion time should be under 8 minutes)   Peak – 600 records/day (Batch completion time should be under 11 minutes) |
| NFR\_APIC\_18 | Performance | **New Batch: Check-In Initial Reminder Trigger**  Description: This batch will send MDP Patient data extract to ROCM to send notification for approval of monthly MDP order.  Note - This job will be executed once per day and will pick up records based on Last Updated Date. SDA will send this data to ROCM and ROCM loads this data and sends to Patient Out Reach team.  Response time for this batch should not be more than **13 sec** for **90%** of the cases.  Current Volume – 60 records/day  Go-Live + 3Yr Volume –   * Average – 120K records/day (Batch completion time should be under 8 minutes)   Peak – 600 records/day (Batch completion time should be under 11 minutes) |
| NFR\_APIC\_19 | Performance | **New Batch: Check-In Final ReminderTrigger**  Description: This batch will send MDP Patient data extract to ROCM to send notification for last chance reminder message for MDP order refill  Note - This job will be executed once per day and will pick up records based on Last Updated Date.SDA will send this data to ROCM and ROCM loads this data and sends to Patient Out Reach team.  Response time for this batch should not be more than **40 sec** for **90%** of the cases.  Current Volume – 60 records/day  Go-Live + 3Yr Volume –   * Average – 120K records/day (Batch completion time should be under 8 minutes)   Peak – 600 records/day (Batch completion time should be under 11 minutes) |
| NFR\_APIC\_20 | Performance | **New Batch: Order Change Post ApprovalTrigger**  Description: his batch will send MDP Patient data extract to ROCM to send notification to patient when their submitted order changed since it was approved  Note - This job will be executed once per day and will pick up records based on Last Updated Date.SDA will send this data to ROCM and ROCM loads this data and sends to Patient Out Reach team.  Response time for this batch should not be more than **40 sec** for **90%** of the cases.  Current Volume – 60 records/day  Go-Live + 3Yr Volume –   * Average – 13K records/day (Batch completion time should be under 8 minutes)   Peak – 600 records/day (Batch completion time should be under 11 minutes) |
| NFR\_APIC\_21 | Performance | **UI Reports: Operational Reports triggered from UI**  Description: These are operational reports that users can download from Reports menu.   * Enrollment Export File * Patient Demographics Export file * MDP Shipping Export File * MDP Order Prescription Export File * Routing Rules - State Exception Report * Program Management Report * Patient Management Report * Patient Enrollment Report * SDA Productivity Report * SDA Enrollment Tracker Report * Order Management Report * Simple Dose Program Level Dashboard Reports * Simple Dose Front End Dashboard Reports * New Enrollments * Enrollment Activity and SLA’s * Retention   Note – Business has not provided dedicated SLA for each report since each report is dependent on data range and data. Business expectation is that each report should complete under 30 seconds.  Response time for each report should not be more than **30 sec** for **90%** of the cases. |

\* Note: All batch executions must not exceed the current defined batch window and complete before 7 am.

### Non Core environments:

N/A

## Failover and High Availability

N/A

# Application Design Details

Refer to Application Design Details (ADD) document.

<https://collab.corp.cvscaremark.com/sites/SEP1/ITPR035330/Project%20Documents/02.%20Design/ADD%20Document>

# Approvals- Baseline and Changes

|  |  |  |  |
| --- | --- | --- | --- |
| **Role** | **Name/Title** | **Date(s):** | **Approval(s) (embed e-mail via copy/paste)** |
| **SDA Project Owner** |  |  |  |
| **SDA Application Manager** |  |  |  |
| **SDA Application Architect** |  |  |  |
| **Enterprise Architect** |  |  |  |
| **Information Security (SRA)** |  |  |  |
| **Digital Project Owner** |  |  |  |
| **Digital Solution Architect** |  |  |  |
| **Digital Disaster Recovery Analyst** |  |  |  |
| **Tech Lead** |  |  |  |
| **Enterprise Data Architect** |  |  |  |
| **System Integrator** | N/A |  |  |
| **Infrastructure Architect** | N/A |  |  |
| **Infrastructure Build** | N/A |  |  |

# Appendix A – Glossary

|  |  |  |
| --- | --- | --- |
| **Acronym (if applicable)** | **Term** | **Definition** |
| SD | Solution Design | Solution Design Document |
| ID | Infrastructure Design | Infrastructure Design Document |
| AD | Application Design |  |
| UML | Unified Modeling Language |  |
| BPMN | Business Process Model and Notation |  |
| ESL |  | Enterprise Services Layer |
| Care 1-on-1 |  | Care 1-on-1 program. |
| CRM |  | Care 1-on-1 Relationship Management program |
| MDP |  | Medication Dispense Package |
| DBPL |  | Database Programming Language(s). Protocol used by DataPower device. |
| TCGRx |  | Automation Device Vendor (TCGRx) |

## Sample BPMN and UML diagrams built using Vision 2010 Standard

