



Solution Design Document v2.0

Revenue Cycle

Patient Credits and Refunds

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1. Introduction

Purpose

This document outlines the key components of the Master Project—the complete automation solution, which may consist of one or more individual projects that together fulfill the full scope of the robotic process automation (RPA). It takes into account important business constraints such as scheduling, peak periods, and expected future increases in volume.

The Solution Architect (SA) focuses on ensuring the solution is:

- Robust – reliable and stable under various conditions
- Scalable – able to handle growth in volume or complexity
- Efficient – optimized for performance and resource use
- Replicable – easy to reproduce in similar environments
- Reusable – built with components that can be used in other projects

This information is primarily intended for developers who will build the initial solution, and later for support developers handling updates or change requests.

The SA is responsible for creating the Solution Design Document (SDD), which, along with the Process Definition Document (PDD), provides all the necessary details for building the automation. The SDD is typically developed near the end of the Discovery phase, once the PDD is nearly complete. It draws on insights gathered during the planning and analysis stages and serves as a detailed blueprint for implementing the automation.

2. Policies and Standards

2.1 Compliance with Company Policies:

This solution design must comply with the following company policies:

- All new developments must be thoroughly tested within the limits of system capabilities.

2.2 Adherence to Company Standards:

This solution design follows the company's development standards

- The solution must be modular, reusable, and fully documented to support both operational use and ongoing technical maintenance.

3.4 Applications Used

Application/ System Name, Version, URL	System Availability (Downtime)	Application Language (Program/UI)	Application Type (Desktop/ Web)	APIs Available (Y/N)	MFA (Y/N)	Environment/ Access method	Application Owner Contact	Comments
Epic Sup	N/A	UI	Desktop	N	N	AD Group	Jennifer Lewis	EPIC is an application used to review and refund patient credits in the Sup environment.
Epic Prod	Midnight – 3am	UI	Desktop	N	N	AD Group	Jennifer Lewis	EPIC is an application used to review and refund patient credits in the production environment.
Microsoft Excel	Unknown	UI	Desktop	N	N	AD Group	HHC	The SQL export report from Epic will be in Excel.
Microsoft Outlook	Unknown	UI	Desktop	N	N	AD Group	HHC	Outlook is used to notify staff of process issues and exceptions.
Network Drive \\HHCsystem.org\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\B7QV6QWV\RevenueCycle\SBO_Patients_Credits_NonProduction\	Unknown	UI	Desktop	N	N	AD Group	HHC	Network drive used to store input files for RPA team for testing.
Network Drive \\HHCsystem.org\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\B7QV6QWV\RevenueCycle\SBO_Patients_Credits_NonProduction\	Unknown	UI	Desktop	N	N	AD Group	HHC	Network drive used to store input files for RPA team for production.

RevenueCycle\SBO_Patients_Credits_Production\								
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4. Scalability and Reliability

4.1 Recoverability

Exception Handling

Exception Type	Application Involved	Exception Details	Action(s) To be taken by the Bot(s):
Business Exception	All	BE000: Unknown business exception occurred. Please research.	1. Email Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
Business Exception	Microsoft Excel	BE001: Input file is missing. Please research	1. Retry 3 times at the top of the hour 2. Fail job 3. Send email to: barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org Re: Missing SQL Report for Credit/Refund Bot
Business Exception	Epic	BE002: Patient is deceased. Please research.	1. Include in exception report that gets emailed to Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
Business Exception	Epic	BE003: Less than 45 days since date of service. Skip record.	1. Include in exception report that gets emailed to Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
Business Exception	Epic	BE004: Adj code not eligible for reversal.	1. Include in exception report that gets emailed to Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org

Business Exception	Epic	BE005: Adj amount(s) for 5015, 5018, 5028, 5032 in Epic do not = PBADJAMT from queue. Please research	1. Include in exception report that gets emailed to Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
Business Exception	Epic	BE006: Patient credit amount in Epic does not match Refund Bot amount from report. Please research	1. Include in exception report that gets emailed to Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
Business Exception	Epic	BE007: No line items in distribution section. Please Review	1. Include in exception report that gets emailed to Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
Business Exception	Epic	BE008: Name in Epic doesn't match name in queue. Please Review	1. Include in exception report that gets emailed to Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
Business Exception	Epic	BE009: TX # does not exist in Epic. Please Review	1. Include in exception report that gets emailed to Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
Business Exception	Epic	BE010: No option to distribute in Epic. Please review	1. Include in exception report that gets emailed to Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
Business Exception	Microsoft Excel	BE011: SQL report column headers have changed. Please research	1. Send email to: barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org Re: Missing SQL Report for Credit/Refund Bot
System Exception	All	SE000: Unknown system exception occurred. Please research.	1. Take a screenshot of the current screen. 2. Email screenshot and any additional exception details to RPA Support Team EBSRPASupport@hhchealth.org for investigation and remediation.
System Exception	Epic	SE001: Epic not opening. Please research	1. Email Business team barbara.rossignol@hhchealth.org cynthia.twining@hhchealth.org



			Cc the RPA Support team with the exception details. EBSRPASupport@hhchealth.org
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4.2 Case Recovery

Status Updates:

- System exception cases will be reported to the RPA Support team for troubleshooting purposes.
- The RPA Support team will investigate and fix the issues before the next run happens.

Manual Interventions:

- Unresolved system exceptions must be manually processed by the business.
- All business exceptions must be manually processed by the business.

4.3 Scalability

Concurrent Processing:

- Since there are 5 automation packages that must be run in order, concurrent processing is not recommended.

Bots Calculation:

- 1 Bot to run on minimum 1 VM, as bot processing is linear, and 1 license.

Virtual Machines:

- To be determined in the development phase and updated.

Virtual Machine	Machine Template	Reason/Description

Orchestrator Queue(s):

- To be determined in the development phase and updated.

4.4 Reusability

1. HHC_SendEmailSMTP
2. HHC_EPICApplication
3. Opening Excel file

4. Closing Excel file

5. Case Management

5.1 Global Assets

Asset Type	Asset Name	Description
Text	GLB1_SMTPPort	SMTP Port number for sending emails
Text	GLB2_SMTPServer	SMTP Server for sending emails
Text	GLB3_SMTPFromEmailAddress	SMTP From Email Address
Text	GLB4_RPASupportEmail	RPA Support email DL
Text	GLB8_EPICApplicationLaunchPath	Launch Epic application
Text	GLB9_EPICApplicationArguments	Applications parameters

5.2 Process-Specific Assets

Asset Type	Asset Name	Description
Text	UA2_RC_SPC_BusinessExcepEmailCc	When there are business exceptions, these email IDs will be notified.
Text	UA2_RC_SPC_BusinessExcepEmailTo	When there are business exceptions, these email IDs will be notified.
Text	UA2_RC_SPC_DispatcherRunDateTime	The date and time when the dispatcher bot last ran. This date will then be used by the report bot to generate the output and exception report.
Text	UA2_RC_SPC_DispatcherRunFlag	Dispatcher bot sets this flag dynamically to make sure it is not running accidentally more than once, when the items are already added to the queue and they are yet to be processed.
Text	UA2_RC_SPC_EmailSenderName	The value should process name such that when emails are sent by the bot, they will understand which process this email belongs to.
Text	UA2_RC_SPC_InputPath	Shared Drive Input location where input files will be placed for the dispatcher to run.

Text	UA2_RC_SPC_OutputPath	Shared Drive Output location where output/exception reports will be placed post reporter completes the run.
Text	UA2_RC_SPC_ReportEmailCc	Email IDs of associates who should be receiving the Report emails
Text	UA2_RC_SPC_ReportEmailTo	Email IDs of associates who should be receiving the Report emails.
Text	UA2_RC_SPC_ReporterManualRunDateTimeRef	If there is a need to run the report bot manually for a specific date and time stamp, this value should be set with the datetime stamp.
Text	UA2_RC_SPC_ReporterManualRunFlag	If there is a need to run the report bot manually for a specific date and time stamp, this value should be set with the datetime stamp.
Text	UA2_RC_SPC_TechnicalExcepEmailCc	When there are technical exceptions, these email IDs will be notified.
Text	UA2_RC_SPC_TechnicalExcepEmailTo	When there are technical exceptions, these email IDs will be notified.

6. Data Privacy and Security

6.1 Data Storage

- Logs are stored within UiPath Orchestrator.

6.2 Data Privacy

- Avoid logging Personally Identifiable Information
 - The following attributes **may not** be used outside of the DEBUG level (e.g. may not be referenced in a production log):
 - Patient Name
 - Address
 - Date of Birth
 - Phone number
 - SSN
 - Account_ID
 - Transaction_ID
 - TXNUM
 - Patientstatus
 - Service_Date
 - Credit_Amt
 - Undistributed_Amt

- PBINSBAL
- PBSPBAL
- PBADJAMT
- Baddebtflag
- HBBAL
- HBINSBAL
- HBSPBAL
- HBADJAMT

- b. The following attributes **may** be referenced in a non-DEBUG statement (e.g. production logs):

N/A

6.3 Data Preservation

- As part of our data preservation strategy, items in the bots queue are subject to a 90-day retention policy.

7. Credentials

7.1 Authentication

- Bot being in specific AD groups
- Epic Access credentials for bot will be required in this process.

7.2 Authorization

- To be determined/confirmed in development phase and updated.

7.3 Encryption

- All asset types are encrypted in the Orchestrator database by default.
- Existing assets are also encrypted when updated.
- Additionally, an extra level of security is provided, as all assets of type Credential and Secret stored here are encrypted with the AES 256 algorithm. They can be invoked by RPA developers when designing a process, but their values can be hidden from them.

7.4 Access Requirements

- Access and necessary role(s) to Business and/or process-specific applications for all environments (Dev/UAT/Pre-Production)
- Access to Epic Sup
- Access to Epic Prod
- Access to Microsoft Excel
- Access to Network Drives
- Access to Microsoft Outlook
- Role(s) required in Epic application to reverse PB and HB adjustments, distribute and refund.

8. Automated Master Project Details

8.1 Automated Process Details

Item	Description
Master Project Name	UA2_RC_SPC_DispatcherFlow UA2_RC_SPC_PBADJ UA2_RC_SPC_HBADJ UA2_RC_SPC_Distribution UA2_RC_SPC_Refund
Robot Type	Unattended
Orchestrator used?	Yes
Scalable	Yes
UiPath version used	2024.10.16 LTS

8.2 Master Project Runtime Details

ITEM NAME	DESCRIPTION
<i>Fill in each bolded section – empty fields are not allowed. If the section does not apply to your automation then mark as n/a.</i>	
Production environment details(Bot(s), Machine(s),Triggers, Processes and Versions)	To be determined/confirmed in development phase and updated.
Prerequisites to run	A SQL report will run and export data equivalent to Epic work queues 154 and 129
Input Data	<i>Input files will be placed daily in a network drive:</i> \\HHCsystem.org\AppDataSrvShares\RoboticProcessAutomation\RevenueCycle\SBO_Patients_Credits_Production\ \\HHCsystem.org\AppDataSrvShares\RoboticProcessAutomation\RevenueCycle\SBO_Patients_Credits_NonProduction\ Input Sample File.xlsx

Expected output	The Automation will attempt to resolve the patient's credit in Epic, through disbursement or refund.
How to start the automated process	<i>Automation will be scheduled to run daily, off hours after SQL report has been run and exported after 12:00am</i>
Reporting (queues reporting, Kibana or another platform)	Output files (exception/success report) will be placed daily in below network drive **Waiting for network path from Cynthia Twining** Sample Exception Report.xlsx
How is Orchestrator used?	<i>Bots are scheduled.</i> <i>Orchestrator Queues are used.</i> <i>Logs will be stored in the Orchestrator.</i>
Password policies (mention any specific compliance requests)	To be determined/confirmed in development phase and updated.
Stored credentials (Never use hardcoded credentials in the workflow!)	To be determined/confirmed in development phase and updated.
List of queues names (Naming convention: ProcessName_QueueName)	<i>UA2_RC_SPC_Performer</i> <i>UA2_RC_SPC_Reporter</i>
Schedule Details	<i>Daily after 12:00am, after SQL report has exported.</i>

Multiple Resolutions Supported? (in case of image automation / Citrix and VDI)	To be determined/confirmed in development phase and updated.
Recommended Resolution	To be determined/confirmed in development phase and updated.

8.3 Environment Details

ITEM NAME	DESCRIPTION
<i>Fill in each section – empty fields are not allowed. If the section does not apply to your automation then mark as n/a.</i>	
Environment used for development (name, location, configuration details etc.)	To be determined/confirmed in development phase and updated.
Environment prerequisites (OS details, libraries, required apps)	To be determined/confirmed in development phase and updated.
Repository for project (where is the developed project stored)	To be determined/confirmed in development phase and updated.
Configuration method (assets, excel file, Json file)	To be determined/confirmed in development phase and updated.
List of reused components	To be determined/confirmed in development phase and updated.
List of new reusable components	To be determined/confirmed in development phase and updated.

8.4 Packages

Include the list of packages and the description for each of them, to explain each one`s purpose:

Package name	Description
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	To be determined/confirmed in development phase and updated.

8.5 Project(s) Workflows

Workflow file name	Description
	To be determined/confirmed in development phase and updated.

9. Configuration

9.1 Configuration Method

- To be determined/confirmed in development phase and updated.

9.2 Configuration Items

- To be determined/confirmed in development phase and updated.

9.3 Interfaces and APIs

- N/A

9.4 Assumptions

- The volume stays consistent.
- There won't be any changes to the input file format.
- There won't be any changes to the application's UI.
- No Scope changes.

9.5 Technical

- All system downtime, maintenance, and upgrades are accounted for.
- All credentials are valid and provisioned with valid access roles.
- All RPA systems downtime should be notified to the Business team [<barbara.rossignol@hhchealth.org>](mailto:barbara.rossignol@hhchealth.org) immediately and any pending queue items should be processed manually.
- All RPA maintenance and upgrades should be notified to the Business team [<barbara.rossignol@hhchealth.org>](mailto:barbara.rossignol@hhchealth.org) well in advance.

9.6 Business

- Input files should be available in the respective applications following the same format and structure as discussed during the requirement walkthrough calls.

10. Risks

- Unexpected system failure(s) causes a fatal error in the bot runtime.
- Changing the input file format may cause unexpected issues.

11. Future Issues

- Epic UI changing

12. Critical Success Factors

- All business exceptions are accurately assigned to ensure correct process follow-up.
- Results are reported in detail as requested for every item in which the bot attempted any processing.
- Reduction in time spent on this manual process.

13. Definitions

Acronyms	Description
As-is process	The manner in which a process is performed before being automated by RPA.
Bot	A service running on a resource (usually VDI) that executes workflows to perform work. Also called a robot or virtual worker.
BU	Business Unit
Business exception	Any deviation that impedes normal flow of the process relating to business rules and logic. A business exception is related to the process and not the environment or system on which it runs.
Control Tower	The server-based component of the RPA system used to provision and manage bots, jobs, queues, and workflows.
Job	Execution of a process by one or more virtual workers (bots).

PDD	Process Definition Document
PFD	Process Flow Diagram
Queue	Container for an unlimited number of structured items that may be accessed by bots. Queue items have a status that can be changed throughout a process.
Schedule	Enables the execution of jobs in a pre-planned manner.
SDD	Solution Design Document
System exception	Any deviation that impedes normal flow of the process is not categorized as a business exception. This may include, but is not limited to system unavailability, credential denial, and timeouts.
To-be process	The manner in which a process is performed after being automated by RPA.
Transaction	A queue item that has been processed by a bot.
Virtual Worker	A term for robot, or bot.
Workflow	The complete set of instructions required by a bot to perform a process.

14. Other

14.1 Future Improvements

- N/A

14.2 Other Remarks

- N/A

14.3 Additional sources of process documentation

Additional Process Documentation	
Video Recording of the process (Optional)	Presidio-HHC RevCycle Patient Credits Design Session (300161250637079) 3-3-2026 Recording.mp4 Presidio-HHC RevCycle Patient Credits Process Discussion (3001612506370) 9-25-25 Recording.mp4 Presidio-HHC RevCycle Patient Credits Process Working Session (-569633533) 12-22-2025 Recording.mp4 Presidio-HHC RevCycle Patient Credits SQL Report Development Assistance (3001612506370) 10-22-2025 Recording.mp4 Presidio-HHC RevCycle Patient Credits SQL Report Modification (3001612506370) 2-5-2026 Recording.mp4 Presidio-HHC RevCycle Patient Credits SQL Report Template Review Questions (3001612506370) 11-24-2025 Recording.mp4 Presidio-HHC RPA Engagement RCM SME Use Case Shadow Session (3001612506370) 8-27-25.mp4 Presidio-HHC RevCycle Patient Credits EPIC Process Discussion (3001612506370) 10-8-2025 Recording.mp4

Video Recording of Proof Of Concept (Optional)	N/A	
Step by Step Guide/Detailed level process map	HHC REV CYCLE CREDIT REFUND RPA STEP BY STEP GUIDE.DOCX HHC REV CYCLE - DETAILED FLOW AS IS.PDF HHC REV CYCLE - DISPATCHER FLOW BOT1.PDF HHC REV CYCLE - PB ADJ BOT2.PDF HHC REV CYCLE - HB ADJ BOT3.PDF HHC REV CYCLE - DISTRIBUTION BOT4.PDF HHC REV CYCLE - REFUND BOT5.PDF	
As-Is and To-Be flow diagrams/High Level Process Map	HHC REV CYCLE - HIGH LEVEL FLOW AS IS.PDF HHC REV CYCLE - HIGH LEVEL FLOW TO BE.PDF	
Standard Operating Procedure(s) (Optional)	SW Refunding PB Patient Payments in EPIC.xlsx	
Work Instructions (Optional)	N/A	
Input Files Location	\\HHCsystem.org\AppSrvShares\RoboticProcessAutomation\RevenueCycle\SBO_Patients_Credits_Production\ \\HHCsystem.org\AppSrvShares\RoboticProcessAutomation\RevenueCycle\SBO_Patients_Credits_NonProduction\	
Input File Sample	Input Sample File.xlsx	
Sample Expected Output Report.xlsx	Sample Expected Output Report.xlsx	
UAT test cases and logs		
High Level Design/Bot Design Document	HHC Rev Cycle - High Level Flow TO BE.pdf	



14.4 Version Details

Date	Author	Title	Version	Comments
3/16/2026	Kim Anderson	Solution Architect/Tarpon Health	1.0	
3/18/2026	Kim Anderson	Solution Architect/Tarpon Health	2.0	Changes from 3/18/2026 Meeting