Pain relief for your mainframe API frustrations

By Hans Otharsson, Customer Success Officer, OpenLegacy

Introduction

Like death and taxes, most mainframes are here for the foreseeable future. As such, let's change the perception of the mainframe, from being a relic of the past, to being an essential contributor to modern digital services and channels. This involves addressing the pain that both you and your organization feel regarding time-to-market delays, internal limitations and resource restraints so the mainframe environment is truly a part of the solution.

> **"**
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> *You have to know the past to understand the present.*
>
> **Carl Sagan**

Pain 01

How to expose CICS/IMS functional endpoints (application business logic) as microservices

Exposing CICS/IMS transactions for consumption outside of the mainframe environment is extremely challenging for most organizations. Who thought that mainframe administrators would need to become "integration archaeologists?" Required skills include: circumventing the countless layers of integration technologies adopted over the years, digging through the inevitable business logic buried within the integration layer(s), shoveling past a number of vendor black boxes and, finally, reaching the System of Record only to find it firmly entrenched behind its own separate layers of complexity, fixes and tweaks.

But do not blame the mainframe developers of the past, they themselves were the innovators and change agents of the time. Their systems lasted decades and used the tools available at the time. Granted, those tools today may resemble hammers and chisels to modern developers, but they worked with the tools they had and succeeded. As the channel and enterprise demands changed, they used what had worked before, leveraging their understanding of the mainframe and the business.

However, the present (and future) is about flexibility, time to market, and innovation. The following automation steps successfully mitigate this pain point by using a process that not only incorporates the best aspects of the mainframe environment, but also effectively uses infrastructure automation and CI/CD/DevOps best practices.

Pain relief for CICS/IMS using OpenLegacy

Step	Description	Benefit
1. Analysis of legacy assets	Automate the analysis of assets no matter their format (Cobol, RPG, SQL, VSAM, XML schemas, screens)	Adds speed and flexibility to the overall process.
2. Flexible generation of digital assets	Control generation of digital assets whether they are microservices-based APIs, serverless functions, connections to Kafka endpoints, etc.	Quickly and easily create customizable modern assets in Java or nodeJS that use modern open source tools. Easily test and build individual units without affecting everything else makes for a much more unified DevOps process.
3. Bypass the middleware	Unless one of your functional endpoints is based within your middleware, like MQ, Tibco, Websphere, etc., you can go directly to the application of record.	Inherent value from cutting out the middleware, namely speed, simplification, and cost.
4. Getting run-time started	CICS—Installation of the OpenLegacy CICS connector IMS—No connector installation necessary	API/ Microservice leveraged in runtime for faster execution. Transparent support for both synchronous and asynchronous runtime execution.
5. Deployment freedom	Deploy the API/Microservice where it makes the most sense for your enterprise.	No "lock-in" to a deployment pattern and/or vendor.

Pain 02

Exposing business logic buried in 3,270 green screens

In the past, we were not surprised seeing a case worker, customer service rep, claims clerk or a corporate accountant writing things on a piece of paper, then logging off one system and signing into another application where they navigate the menu and find a green screen to enter the information they just wrote down.

What is the lasting impression the customer has of the enterprise and will their experience be a factor in their brand loyalty?

The problem is is that the situation has not improved, the employees are still writing things down, and logging off then on. But, now they are speaking on the phone with a customer frustrated by the fact they need to be on the phone versus doing this themselves.

Why is the enterprise finding itself in this obviously inefficient scenario? There can be many reasons for this, ranging from corporate mergers to siloed internal development processes. Regardless, these green screen applications are still valuable to the enterprise and will be around for the foreseeable future. We need to dramatically improve the

interaction with the applications and unlock the ability to:

- Seamlessly communicate between the various applications behind the scenes

- Access end-customers, allowing them to self-serve

- Give our team members a consolidated view of the disparate applications

Over the years, numerous approaches were deployed to remediate this customer and operational efficiency pain. These approaches ranged from recreating new silo applications requiring nightly reconciliation to screen scraping. OpenLegacy has quite a number of customers in different industry verticals that attained an impressive level of operational improvement by leveraging OpenLegacy's UI Modeling capabilities (not screen scraping). For example, the deployed solutions can be used for:

- Citizen and customer access to update information, change requests, etc.

- Building a 360° view of a customer by integrating numerous disparate applications

- Enabling enterprises to participate in popular comparison shopping portals on the web

- Providing do-it-yourself quotes for things like automobiles, insurance policies and more

The following automation steps minimize these pain points with a process that not only incorporates the best aspects of the mainframe environment and your green screen processes, but also effectively uses infrastructure automation and CI/CD/DevOps best practices.

Pain Relief for Green Screens using OpenLegacy

Step	Description	Benefit
1. Screen tracing	Users interact with screens using different user flows. Need the ability to trace flows.	Flexible enough to only record what actually happens rather than just capturing the screen.
2. Flexible generation of digital assets	Generation of Java-based SDKs for reuse across a variety of use cases.	Quickly and easily create a library of assets based on screen usage for building new scenarios without having to record every use case.
3. Getting runtime started	CICS/IMS—No connector necessary, leverages the standard 3270 connector.	API/Microservice can be leveraged at runtime for faster execution and direct invocation of screens.
4. Deployment freedom	Deploy the API/Microservice where it makes the most sense for your enterprise.	No "lock-In" to a deployment pattern and or vendor. Enables screen functionality to become portable.

Pain 03

Exposing VSAM data as a microservice

Over the years, the mainframe user community has been stymied by the inability for large VSAM environments to play an active role in the digital ecosphere of their enterprise. We have heard challenges like this from our customers:

> "We have thousands of VSAM files containing data for decision making and processing. We need those VSAM files available to cloud-based services while continuing to run the CICS and batch processes that use them as well."

> "Can you use APIs and Microservices to enhance a decades-old VSAM infrastructure with hundreds of copybooks, VSAM business logic with both fixed and variable length files, in addition to conditionality, re-defines and other layers of complexity?"

These VSAM challenges require an integration platform that appreciates the mainframe environment's expectations. VSAM was adopted decades ago because it was better than other approaches in an environment that expects I/O exceeding 50,000 per second.

These following automation steps successfully mitigate this pain point for many of our clients. It uses a process that not only incorporates the high volume transactional requirements of VSAM KSDS, but also effectively uses infrastructure automation and CI/CD/ DevOps best practices.

Pain Relief for Exposing VSAM as a Service Using OpenLegacy

Step	Description	Benefit
1. Parse the copybooks	Builds access logic based on your production environment	Absolutely no change to current production code base or the need for any new code development.
2. Runtime registration of the OpenLegacy CICS VSAM connector	Enables access to VSAM data for reading, writing and searching processes.	Direct access to the System of Record without blocking records, tracks or cylinders. The Java SDK contains the transport, modeling, communication and security.
3. OpenLegacy SDK & customer API	The customer API consumes the generated OpenLegacy SDK. The API contains the contract and is exposed as a RESTful or event streaming service.	Easily deployed to your API gateway, services meshes, containers or queue managers.
4. From copybook to production	Automated process to drive consistent 'VSAM to Microservice' delivery	Production microservices in just a few hours

Pain 04

How to make your mainframe not only an API contributor, but also an API consumer

So you may ask yourself, why does my mainframe application need to talk to something outside of its four corners?

"No good reason—my mainframe is the oracle (no pun intended) of all knowledge and data"

Sorry, even if you prolonged the inevitable, this is simply not true any longer.

Over the years, you pulled in foreign exchange rates, zip codes, interest and actuarial tables on a regular basis via tape, disc, or FTP. This was done at the time to accommodate a need. But, real time external integration is now a reality, even for the mainframe.

Granted, a majority of the focus around the mainframe today is about exposing critical business processes and data buried behind the layers of complexity stacked on your core system. But the forward thinking architecture viewpoint is about...

"How do I make my mainframe not just a contributor, but also a consumer in our digital ecosphere?"

A developer's integration platform fostering "creativity by design" has proven to be extremely beneficial to the enterprise.

Leveraging the institutional knowledge of the legacy application in the race to develop new products and services is not only disruptive, but also rewarding.

One of our more creative customers used the capabilities of OpenLegacy to rapidly develop the coexistence integration flows in a Core Banking System Replacement (CBSR) initiative. To accelerate the project timeline and reduce project risk, this bank needed constant and dynamic auto-generation of mainframe code.

This contract first process (meaning the new CBS had pre-defined APIs), began with pulling in those API definitions, then auto generating the necessary code, programs and copybooks for implementation into the client's environment. This enabled remaining components of the existing CBS to seamlessly communicate with the new CBS.

The following automation steps successfully resolve this pain point by enabling the mainframe to seamlessly integrate with the pre-defined 3rd party APIs. The process minimizes manual coding, and incorporates the strengths of the mainframe environment while using infrastructure automation and CI/CD/DevOps best practices.
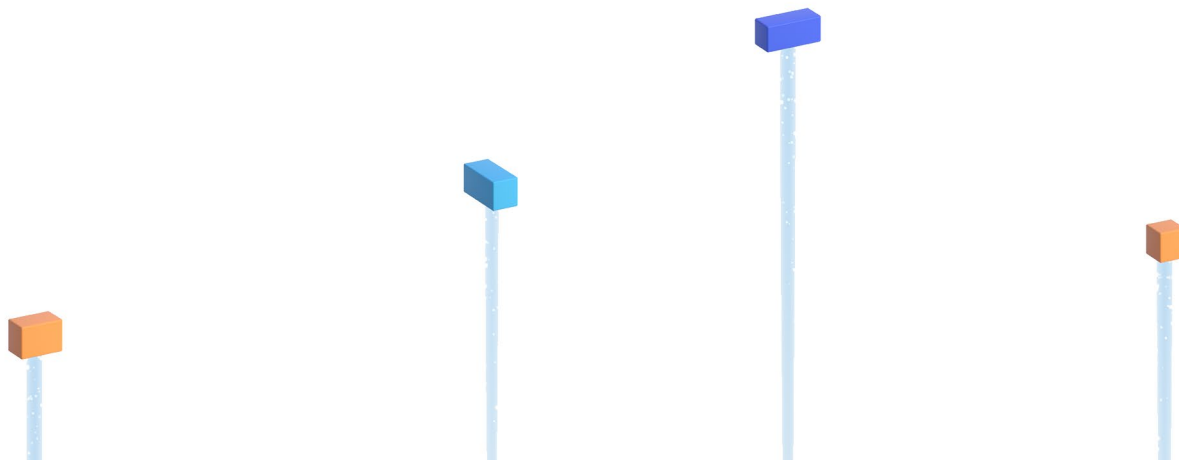
Pain relief for creating "reverse APIs" so your mainframe can consume APIs

Step	Description	Benefit
1. Parse existing API definitions	Reads in Swagger code from existing APIs and makes it ready for connections.	Automates the process of translating the Swagger into something to generate code from.
2. Generate code for use on mainframe	Generate the COBOL programs and copybooks.	Mainframe developers are familiar with COBOL code, so this process makes it easy for them.
3. Load the artifacts into the mainframe environment	Just add the code. API Caller takes care of the serialization of data.	Mainframes only need some basic COBOL code. Any translation is done outside the mainframe.
4. The mainframe is now a consumer of your Digital Ecosphere	Create calls from existing applications to generate code and you are ready to go.	Mainframe developers work as they always do and get the benefit of data from digital systems.

If you are feeling IBM mainframe pain and want some relief, please contact us at www.openlegacy.com.
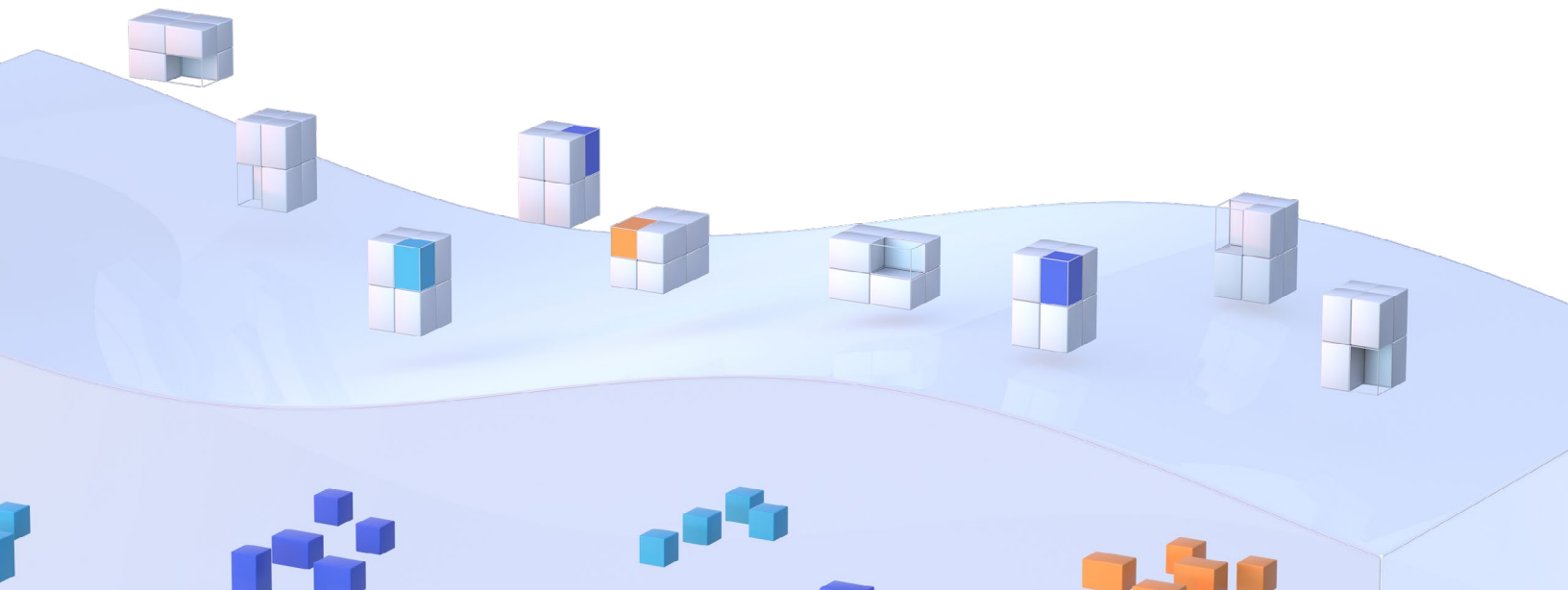
About Hans Otharsson

Hans is a global leader in legacy transformation programs with decades of experience developing, enhancing, maintaining, troubleshooting and transforming so called 'legacy applications' and associated environments. His global journey has taken him into countless environments and business scenarios, where his "straight to the point" approach has enabled him to bring true change and business driven transformation to his clients. His ability to quickly assess a situation and determine if an organization can bring value—and offer suggestions for other alternatives if needed—has made him a trusted advisor to numerous global organizations. Hans has many years' experience with 'legacy modernization' in senior executive roles at Consist Software Solutions and Ateras. At Software AG, Hans was responsible for Professional Services Sales & Delivery in North America and Canada. He also founded ModernWiser, a consultancy helping organizations understand their legacy modernization options. Hans started his career in banking and enterprise accounting systems.

In his current role as Customer Success Officer at OpenLegacy, Hans is responsible for corporate operations and client success. These dual roles capitalize on Hans' strengths of quality delivery, a customer first mentality, and solid industry experience—all of which are truly echoed in his mantra: "We measure our success on our clients' success."

About OpenLegacy

OpenLegacy's Digital-Driven Integration enables organizations with legacy systems to release new digital services faster and more efficiently than ever before. It connects directly to even the most complex legacy systems, bypassing the need for extra layers of technology. It then automatically generates APIs in minutes, rapidly integrating those assets into exciting new innovations. Finally, it deploys them as standard microservices or serverless functions, giving organizations speed and flexibility while drastically cutting costs and resources. With OpenLegacy, industry-leading companies release new apps, features, and updates in days instead of months, enabling them to truly become digital to the core.