



GENROCKET INDUSTRY SOLUTIONS

X12 EDI Test Data Generation for Health Care

ABOUT X12 EDI

The world of health care, like many industries, has become increasingly automated over time. Today almost all administrative health care information is captured and stored in digital format and exchanged between cooperating health care organizations using a well-defined *Electronic Data Interchange* standard developed and maintained by the well-known standards body, X12.

The management of health insurance claims and the exchange of patient care information is closely regulated by federal HIPAA standards and must be carefully safeguarded by all participating organizations, including health insurance companies, health care providers and insurance clearinghouses (the intermediaries that connect participants over secure networks). The US Federal Government through HIPAA has mandated a series of X12 transaction sets for exchanging administrative data between trading partners in a consistent manner.

As an official standards body, X12 has been chartered by the American National Standards Institute (ANSI) to develop and maintain standards that support digital business processes across several industries. According to the [X12.org website](https://www.x12.org), more than 300,000 organizations use the 300+ EDI transaction sets to ensure the timely and accurate processing of health care information every day.

Health care providers submitting claims for insurance coverage must translate human-readable information into EDI transaction codes formatted as complex hierarchical data structures for each medical service provided to patients.

A clearinghouse receives the X12 transaction set, determines which participating organizations will receive the information and securely processes and forwards the data. Insurance providers decode the transaction, process the request and respond with a different X12 transaction set that contains approvals, payment instructions and the status of pending actions.

Health Care Industry Data Feeds



In the example above, the EDI 837 document is the health care claim transaction set for defining the codes and data elements required for submitting insurance claims. The response to the EDI 837 claim is defined by the EDI 835 health care claim payment/advice transaction set, which specifies the codes and data elements for responses from insurance companies. Responses contain information about making payments and include other information such as an explanation of benefits (EOB) or an explanation of payment (EOP) remittance advice to the health care providers involved.

There are dozens of EDI transaction sets just for the health insurance industry alone. An implementation guide for each is developed by X12's Insurance Subcommittee and is then also published by Washington Publishing Company (WPC) as an XML Schema Definition (XSD).

THE SOFTWARE TESTING CHALLENGE

The X12 EDI standard has helped to enable the digital transformation of health care, resulting in tremendous benefits in cost savings and operational efficiencies for all parties concerned. At the same time, X12 EDI can present significant challenges for quality assurance organizations charged with testing the software for managing the massive volume of claims, payments and other transactions that take place every minute of every day.

Challenge #1: Provisioning Accurate Data

In order to test the multiple data feeds carrying X12 EDI transaction sets, accurate test data must be obtained. EDI test data must exercise all transaction codes, represent real-world scenarios, and contain both likely and unlikely input values for positive and negative testing. Testing edge cases

and boundary conditions requires control over the data variations used for testing. And of course, the data must be accurately structured in the proper X12 format to ensure compliance with each X12 EDI transaction set specification.

Challenge #2: Obtaining High Volume Data for Load Testing

While accurate data is required for functional and compliance testing, high volume test data is necessary for load testing to ensure applications operate correctly under heavy traffic conditions. X12 transactions are secure, bi-directional, real-time communications events between multiple trading partners. Applications must handle an instantaneous burst of activity or prolonged and heavy load conditions without dropping or mishandling transactions. That requires high volume test data that is properly formatted for each type of EDI transaction set.

Challenge #3: Eliminating Personally Identifiable Information

To address the first two challenges, one might assume that testers can copy and mask a sufficient volume of EDI production data to perform the necessary testing. However, HIPAA standards require production data containing *Personally Identifiable Information* (PII) be painstakingly scrubbed to anonymize the data before it is used. This takes a great deal of time and requires the use of complex and costly Test Data Management (TDM) systems. This is one of the many reasons why testers often spend more time provisioning test data than performing their test operations.

Challenge #4: Managing and Versioning EDI Documents

Like all standards, X12 EDI constantly undergoes a revision process to keep pace with advancements in the health care industry. As each new version of the standard is released, test cases and test data must be revised to conform to new specifications. This requires testers to manage versions of test data used for testing. Similarly, if testing requires the data to be programmatically changed (e.g., calculating account balances for insurance premiums and deductibles during testing), test data must be returned to its original state before it can be used by other tests to ensure consistency.

Challenge #5: Adapting to the X12 EDI standard

It's common practice for some organizations to adapt the X12 EDI standard for their specific needs. This might be needed to process new forms of treatment or to support specialized policy provisions and business processes. When any standard is adapted in this way, test data must be controlled and managed to accommodate these changes. This requires the QA team to provision test data that accurately conforms to a given organization's implementation of the X12 standard to avoid the potential for false positives and false negatives in their test results.

Challenge #6: Linking and Blending Program Data with Generated Data

Many health care organizations need to link EDI document data for validity so that, for example, an EDI 837 P claim has a matching member ID and provider record. In addition, there may be a need for the EDI data to include specific program data such as diagnostic codes or procedure codes.

THE GENROCKET SOLUTION

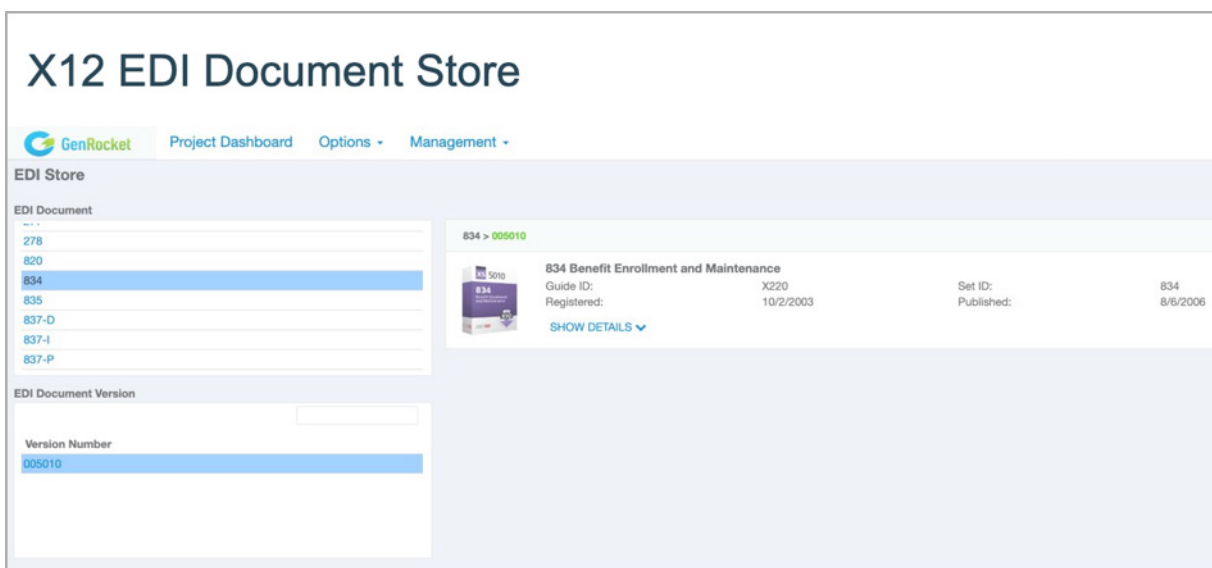
GenRocket has developed a turnkey solution to meet the challenge of provisioning X12 EDI test data in a simple and powerful way. Its *Industry Solutions Package* for X12 EDI allows QA teams to generate real-time synthetic test data with full control over data variety and volume. The X12 EDI solution is an add-on package for the GenRocket TDG™ platform and provides a user-friendly management layer to configure and control advanced test data generator/receiver modules. It allows self-service provisioning of comprehensive X12 EDI test data on-demand.

Building an X12 Document in Minutes

Through a partnership with X12.org and Washington Publishing Company (WPC), GenRocket has created an online store that WPC subscribers can use to provide quick and easy access to X12 documents in XSD format. GenRocket has simplified X12 test data provisioning with an intuitive graphical user interface that guides the tester through a step-by-step process.

Here is a summary of the user experience when building X12 test data with GenRocket:

1. The Admin selects the appropriate EDI XSD from the **X12 EDI GenRocket Store**.



The screenshot displays the 'X12 EDI Document Store' web application. At the top, there is a navigation bar with the GenRocket logo and links for 'Project Dashboard', 'Options', and 'Management'. Below this, the 'EDI Store' section is active. On the left, a sidebar titled 'EDI Document' lists various document types: 278, 820, 834 (highlighted), 835, 837-D, 837-I, and 837-P. Below the sidebar, the 'EDI Document Version' section shows a 'Version Number' of 005010 (highlighted). The main content area displays details for the selected document, '834 > 005010'. It includes a small image of the document cover, the title '834 Benefit Enrollment and Maintenance', and a table with the following information:

Guide ID:	X220	Set ID:	834
Registered:	10/2/2003	Published:	8/6/2006

A 'SHOW DETAILS' link with a dropdown arrow is located below the table.



- Then, by clicking one button in the EDI Test Data Management Dashboard, an EDI Project is automatically built in about 10 minutes.

EDI Test Data Management Dashboard

GenRocket Project Dashboard Options Management Help Admin

EDI Management Dashboard

EDI Header

Name Action

834-005010-X220	
835-005010-X221	
837-005010-X299	

EDI Versions

Version	Description	Action
1.0	Edi Version - ...	

Copy 100 Headers

EDI Segment And Loops

	Min Occurs	Max Occurs	Loop Count	Action
ISA_InterchangeControlHeader	1	1	1	
GS_FunctionalGroupHeader	1	1	1	
ST_TransactionSetHeader	1	1	1	
BGN_BeginningSegment	1	1	1	
REF_TransactionSetPolicyNumber	0	1	1	
QTP_FieldEffectiveDate	0	1	1	
QTY_TransactionSetControlTotals	0	3	1	
Loop_1000A	1	1	1	
Loop_1000B	1	1	1	
Loop_1000C	0	2	1	
Loop_2000		1	1	
SE_TransactionSetTrailer	1	1	1	
GE_FunctionalGroupTrailer	1	1	1	
IEA_InterchangeControlTrailer	1	1	1	

- At this point, the Admin can easily navigate to loops, segments, elements and sub-elements in the EDI document to customize the project to meet their specific test data needs. The EDI Test Data Project Dashboard provides a granular view for making changes to any element of the test data using GenRocket's graphical interface for managing test data configuration.

EDI Test Data Project Dashboard

GenRocket Project Dashboard Options Management Presets

Project Dashboard

Projects

Q Filter

EDI-834-005010-X220	
EDI-835-005010-X221	

New Project All Projects 79 Proj

Queue Status

Queue Id Action Status

No tasks are waiting in the queue to be executed.

Refresh

Resources

My Resources

resource.home.directory
resource.jdbc.config
resource.jdbc.dest.config

Add Resource Add Service Download My Profile Download Office Certificates Select Server

EDI-834-005010-X220 - Version 1.0

Project Versions

Name	Description	Action	Manage
1.0	Edi Version - 1.0		Pick

Copy Version New Version

Scenario Chain Sets

Advanced Search

EDIScenarioChainSet1

New Scenario Chain Set

Domains

Advanced Search Q

AdditionalBenefitIdentifiers...	
AdditionalLoopTermination2...	
AdditionalReportingCategori...	
AdministrativeCommunicati...	

New Domain 50/104 Domains

Scenarios

Advanced Search Q

AdditionalBenefitIdentifiers232...	
AdditionalLoopTermination2000...	
AdditionalReportingCategories2...	
AdministrativeCommunications...	

New Scenario 50/104 Scenarios Search Download

Scenario Chains

Advanced Search

EDIScenarioChain1
EDIScenarioChain2
EDIScenarioChain3
EDIScenarioChain4

New Scenario Chain

Management

Organization Variable Project Version Variable Configuration Management Migration Management Generator Tags Virtual Service

banking

New Organization Variable Set Edit Organization Variable Set Delete Organization Variable Set

Name Value

org.banking.bankingid 10000

New Organization Variable

GENROCKET'S X12 EDI SOLUTION BENEFITS

The GenRocket solution meets the challenges posed by X12 EDI test data provisioning in the following ways:

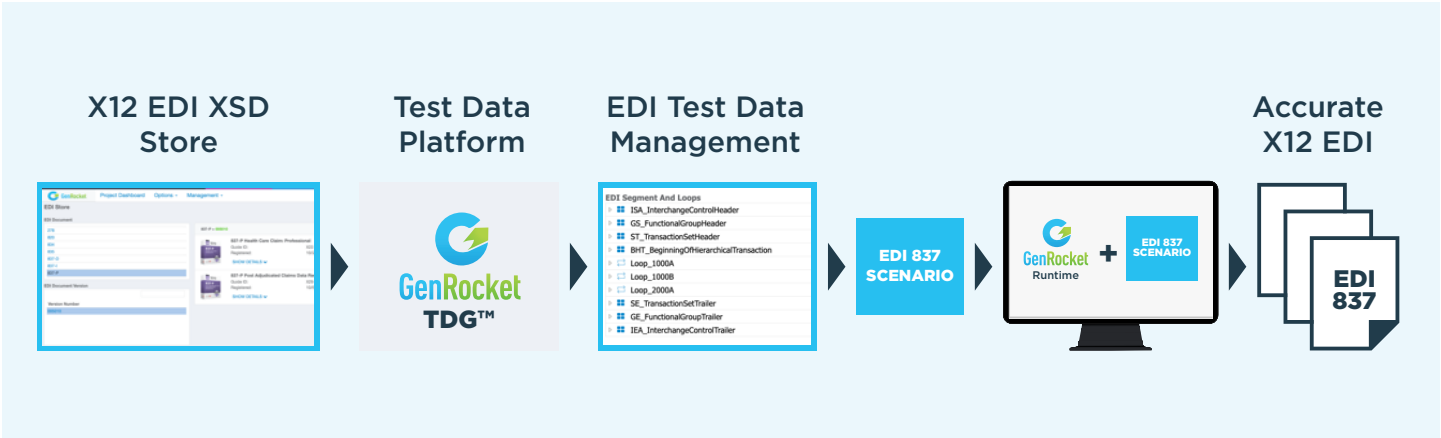
- Self service building & provisioning of accurate X12 EDI test data
- Assured HIPAA compliance by using synthetic test data vs. production data
- Rapid test data case building through Test Data Permutations and Test Data Rules.
- Data consistency and referential integrity across multiple EDI documents
- Customize X12 EDI documents to match internal organizational testing needs
- Blend EDI test data with actual program data (e.g., Member ID and Procedure Codes)

GenRocket's integrated and automated approach provides test data for any X12 EDI transaction set used by the health care industry and generates real-time, secure test data with complete control over data variation and volume. GenRocket allows testers to create a compliant X12 EDI document in just 10 minutes, allows easy customization of the test document and once configured, generates test data on-demand with a self-service model that allows testers to spend less time provisioning test data and more time testing.

For QA managers, GenRocket brings a new level of test data speed, quality and control that will drive higher levels of operational efficiency, greater coverage and ensure that higher quality software is release to production environments.



GENROCKET X12 EDI TEST DATA SOLUTION



GENROCKET X12 EDI BLENDED DATA SOLUTION

