

SOLUTION BRIEF
CA TEST DATA MANAGER FOR HPE ALM

CA Test Data Manager for HPE ALM

Generate all the data needed to deliver fully tested software, and export it directly into Hewlett Packard Enterprise Application Lifecycle Management requirements, test cases and defect management. Data constraints and bottlenecks are eliminated as re-usable data assets are provisioned on demand from a central repository. The rich test data can be linked to the smallest set of tests needed for maximum functional test coverage and exposed to test and development teams within HPE ALM, providing them with everything they need to deliver quality software on time and within budget.

Executive Summary

Challenge

Quality data is central to the delivery of valuable software, and yet the importance of delivering the right data, to the right place, at the right time is often overlooked. Application quality is routinely compromised by the use of high volume, low quality production data which is costly to maintain and typically contains sensitive data, and yet usually covers just 10-20 percent of the tests that need to be run. Defects are detected late, when they require far more time and resources to fix, while delays quickly mount and the end-user experience suffers.

More time is wasted as testers and developers search manually through unwieldy production data looking for the specific data sets they need, and they usually lack automated data discovery and provisioning tools and processes. Where no data exists, it is usually created manually, but this is another slow and error-prone process. Data is unavailable in parallel, so teams sit idle, waiting for it to become available upstream, while rare or interesting data is frequently used up by another team or lost during a data refresh.

These delays and data constraints are especially acute for organizations trying to keep up with constantly changing business or user needs. It is not unusual for test and development teams to spend the majority of a sprint or cycle waiting for data rather than developing new features or remedying defects.

Opportunity

CA Test Data Manager provides a complete, end-to-end test data management solution that is fully integrated into HPE ALM. It enables organizations to provide test and development teams with on demand access to the data and environments they need to deliver quality software on time and within budget.

Complex data structures can be quickly understood using automated data profiling and sophisticated modeling, identifying any missing data needed for rigorous testing at a glance. Powerful synthetic data generation can then be used to plug any gaps, creating the smallest set of data needed to execute every possible test. High performance, native masking engines can also be used to ensure that existing data is secure for use in test environments.

The rich data is stored centrally in a test data warehouse and, from there, it can be fed directly into HPE ALM requirements, test cases and defect management. Data is “matched” to the exact tests it can run, allowing testers and developers to request the exact data sets they need and receive it in minutes from an on demand web portal. Powerful version control and data cloning mean that data is available across versions and releases in parallel. This means that delays are avoided and distributed teams have access to the data they need to deliver quality applications earlier and at less cost.

Executive Summary

Benefits

- Fully understand existing data and identify any missing data needed for rigorous testing at a glance.
- Provide testers with all the data needed for comprehensive testing, on demand and in parallel.
- Detect defects earlier, when they require far less time and resources to fix.
- Test using rich synthetic data or secure existing data to avoid exposing sensitive information to non-production environments.
- Mitigate the risk of a costly data breach.
- Reduce prohibitively high infrastructure costs.
- Provision data to multiple teams in minutes, and eliminate the bottlenecks created by data constraints.
- Generate rich virtual data which covers the full range of possible scenarios.
- Provide teams with the stable environments they need, free from cross-system dependencies and constraints.

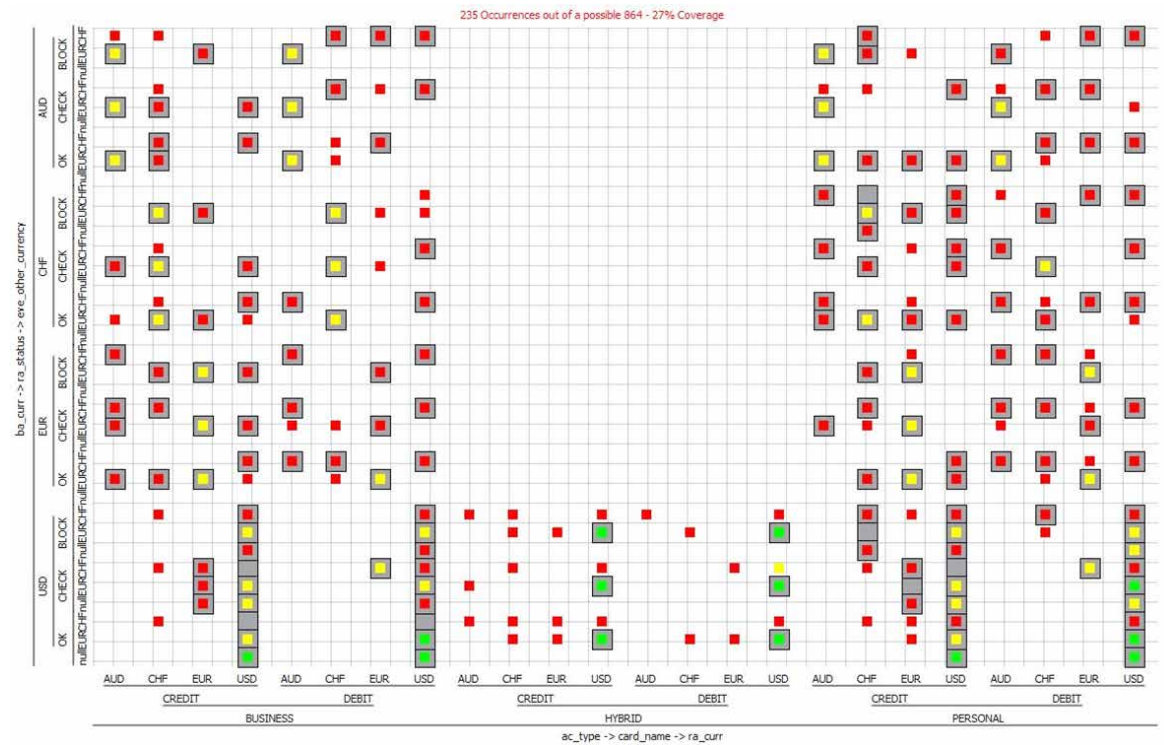
Section 1:

Understand Exactly What Data You Have and Identify any Data Needed for Rigorous Testing at a Glance

Existing data stored enterprise-wide and in HPE ALM can be quickly imported to CA Test Data Manager using automated data profiling algorithms to build a complete, multi-dimensional picture of what data exists. This exposes even the most complex relationships, providing an in-depth understanding of what variables exist and how they relate, even when faced with minimal documentation.

Figure A.

Data can be dynamically queried using spot diagrams.



Data visualization can be used to dynamically query complex data on a highly granular level, identifying what valid and invalid combinations of test data attributes exist. Any missing data needed for rigorous testing can be identified at a glance, while sophisticated coverage analysis can be used to measure exactly what proportion of possible tests the data can satisfy. Interesting or rare combinations of data can be identified, locked and reserved.

- Provide testers, developers and the business with an in-depth understanding of production data and live data models, even when no subject matter expertise or comprehensive documentation is available.
- Identify any missing data needed for rigorous data at a glance, and know exactly what data needs to be created for rigorous testing.

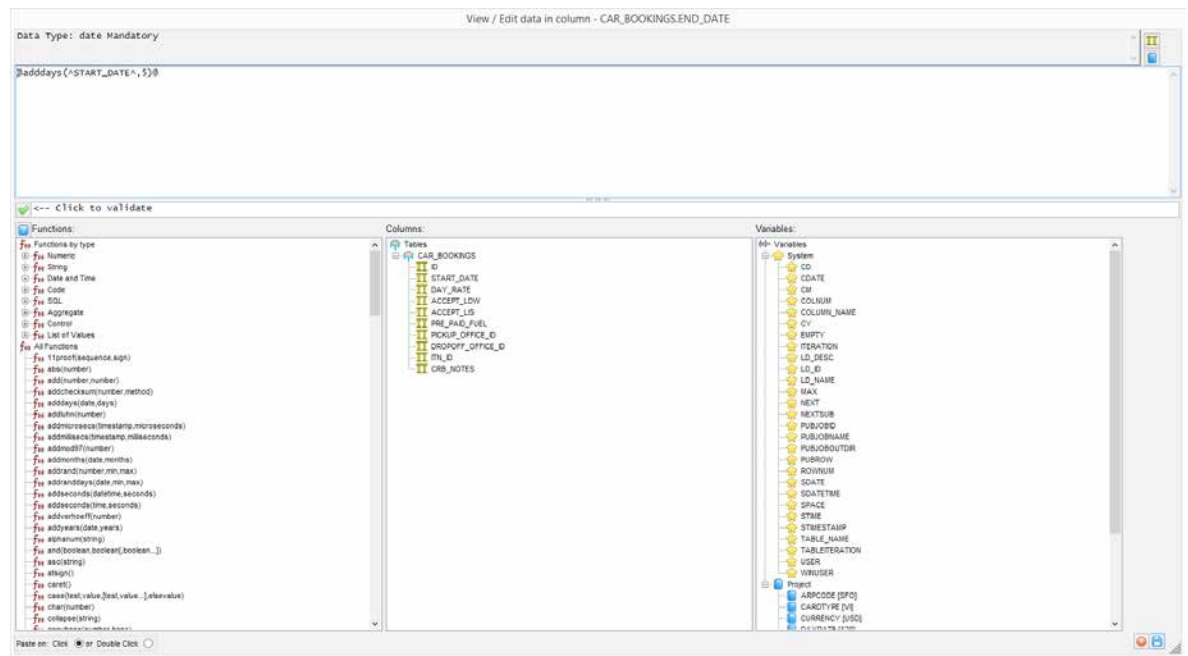
Section 2:

Enhance Existing Data Using Powerful Synthetic Data Generation

Based on this data model, powerful synthetic data generation can be used to create the smallest set of data needed for maximum test coverage. A comprehensive set of combinable generation functions, seed tables and variables can also be used to create data for specific test cases, while data can be generated using parameters defined in HPE ALM. This data includes the outliers, unexpected results and future scenarios needed for rigorous testing, providing testers with all the data they need to discover defects earlier, when they require far less time and resources to fix.

Figure B.

The Data Painter tool provides a comprehensive set of combinable functions, seed tables, and system and default variables.



Using powerful synthetic data generation allows you to:

- Detect defects earlier, when they require far less time and resources to fix, by testing every outlier, unexpected result and negative path.
- Test using rich synthetic data with all the characteristics of production but none of the sensitive content, and avoid costly data breaches.
- Create system data which is tailored to HPE ALM test cases, using powerful data generation functions, default values and variables.

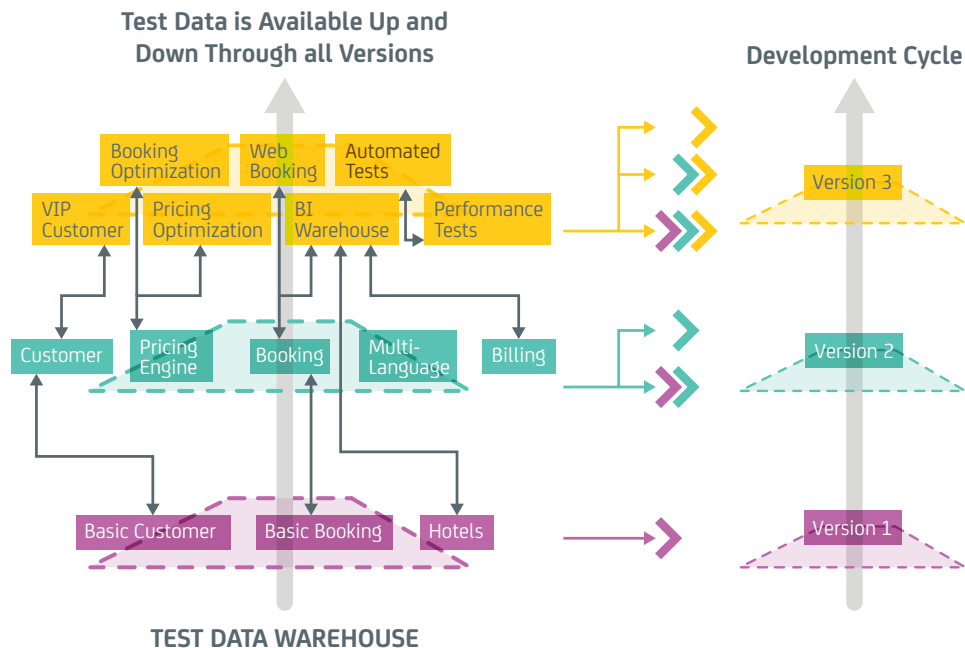
Section 3:

Store Data as Reusable Assets in a Central Test Data Warehouse

The enhanced test data is stored as re-usable assets in a test data warehouse, providing a central repository to manage existing data from across the enterprise. The data is “matched” to the exact tests it can run on the basis of stable criteria and can be fed directly into HPE ALM requirements, test cases and defect management. Testers and developers are thereby provided with everything they need to deliver full tested software earlier and at less cost.

Figure C.

Data stored in the test data warehouse is updated to reflect changes to the requirements.



Powerful version control means that data sets automatically reflect and replicate changes made to system requirements, across versions and releases. Highly distributed teams are provided with the up-to-date data they need, while rare or interesting data is not eaten up by other teams or lost during a refresh. All the data needed for efficient regression testing is retained, allowing highly distributed teams to work in parallel to deliver quality software which reflects constantly changing business requirements.

The Test Data Warehouse allows you to:

- Store data pools centrally, and feed them directly in HPE ALM requirements, test cases and defects management.
- Avoid prohibitively high infrastructure costs by provisioning specific data sets “matched” to the exact tests which they can run.
- Re-use data across versions and releases in parallel to maximize the value of work done and perform more efficient regression testing.

“Our IT pipeline has new releases going into production on a weekly basis. CA Test Data Manager has significantly reduced our testing cycles to help meet these requirements.¹”

Senior Engineer, Retail Company

Section 4:

Expose Test Data to Distributed Teams in Parallel and on Demand

Data is provided to test and development teams via a self-service web-portal using automated data discovery to find it in minutes from the test data warehouse, while data mining will quickly find it from among multiple back end-systems. Dynamic form building means that data attributes are mined and combined using pre-defined criteria, rather than fixed values, providing testers with the exact data sets they need on demand.

Figure D.

The Web-Based, Test Data on Demand Portal.

Easy TDoD Logout Help			
AccountApplicationOverview AccountApplicationOverview Creditcards	Additional Account Application Additional Account Application Creditcards	Authorisation Transactions Authorisation Transactions Creditcards	Create Credit Cards Create Credit Cards Creditcards
CreateStorefrontPeopleandOrders CreateStorefrontPeopleandOrders StoreFront - Amazon	CreateVirtualCompany CreateVirtualCompany Virtualize - Credit Data	Credit Card Unusual Events Credit Card Unusual Events Creditcards	CreditCardApplicationManagement CreditCardApplicationManagement Creditcards
Full Account Application Full Account Application Creditcards	Oxford to Newbury Day at the Races Oxford to Newbury Day at the Races Journeys	Payment Transactions Payment Transactions Creditcards	Primary Account Application Primary Account Application Creditcards

As it is provisioned, data is cloned so that multiple teams can receive the data they need in parallel. This avoids the time wasted on manual data creation and waiting for data to become available, allowing testers to deliver fully tested software to market on time, and within budget.

With CA Test Data Manager for HPE ALM, you can:


- Significantly reduce the time and resources required to provision data, and enable testers to work in parallel.
- Assemble existing data objects stored in the test data warehouse into more complex scenarios, and test every possible scenario.
- Clone data as it is provisioned, and avoid the delays created when waiting for data to become available.


“With CA Test Data Manager, we reduced our time to get test data from 21 days to two days, making our entire software delivery cycle more efficient.¹”

Director of quality assurance and strategy, Financial Services Company

Section 5:

Link Test Data to Optimized Test Cases and Export Them Directly Into HPE ALM

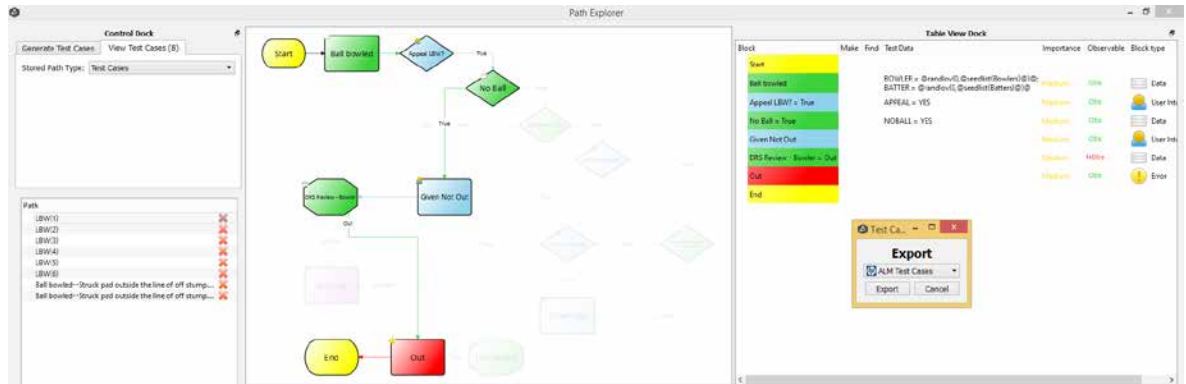
Through the close integration with CA Test Case Optimizer, test data can be generated at the same time as optimized test cases and can be exported directly into HPE ALM. 

Existing test cases and requirements can be imported directly from HPE ALM to CA Test Case Optimizer, where they are converted into unambiguous, active flowchart models. Any redundant, duplicate or invalid tests can be identified and removed automatically, while any additional tests needed to cover 100 percent of requirements are generated. Test cycles are thereby shortened, while more defects are detected earlier, significantly reducing the risk  budget over-run and scope creep.

As tests are created, CA Test Case Optimizer will call CA Test Data Manager to automatically find data in the test data warehouse, or mine it from multiple back-end systems. Any new data needed to execute the optimized tests will be generated automatically, and will be “matched” to the exact test it can run. The tests and data are then exported back out to HPE ALM, providing testers and developers with everything they need to deliver valuable software that reflects constantly changing business requirements.

Figure E.

An “active” flowchart model from which a set of optimized test cases have been derived with test data attached. Only eight of a possible 28 test cases in this example need to be run for maximum coverage, and these can be exported to HPE ALM and “matched” to the data needed to execute them.



- Find and make data, and “match” it to test cases as they are created, making everything needed for rigorous testing available to testers within HPE ALM.
- Optimize existing test cases and generate the smallest set of tests needed for maximum coverage, shortening test cycles and detecting defects earlier.
- Automatically update test cases and data when the requirements change, delivering fully tested software which reflects constantly changing user needs.

Section 6: A Fully Integrated Solution

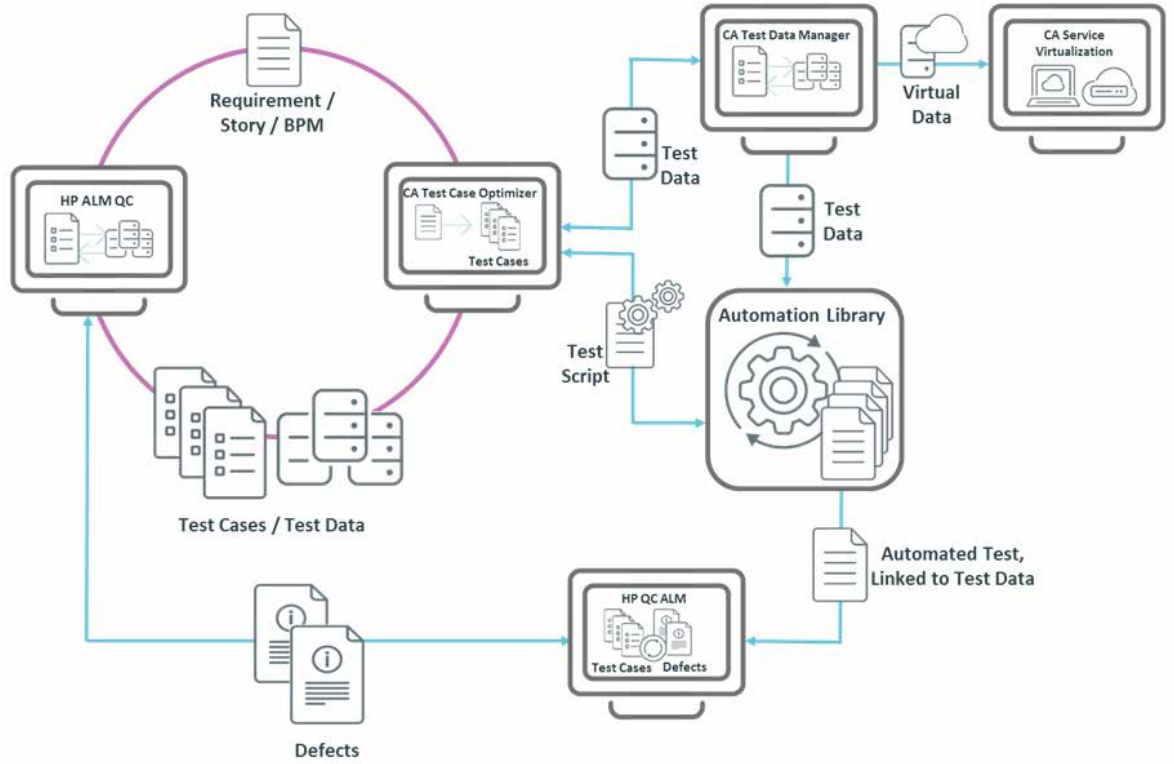
A fully integrated, end-to-end solution, CA Test Data Manager helps organizations provide testers and developers with the environments they need to deliver quality software on time and within budget. Virtual data can be generated so that it covers the full range of possible scenarios and is synchronized across the inter-dependent databases and services that exist in complex applications. The synthetic responses can be deployed directly into a deployed virtual service and can be exposed to test teams on demand through the web-based portal. This enables highly distributed teams to work in parallel, free from cross-system constraints.



With CA Test Case Optimizer, these virtual end-points can be overlaid directly onto requirements or test cases imported from HPE ALM. Testers and developers can define exactly what in a composite system or set of tests needs to be virtualized, using CA Test Data Manager and CA Service Virtualization to simulate any unavailable or missing components they need.

Figure F.

From the flowchart model, virtual end-points, test data, test cases and test scripts can all be generated.



Using CA Test Data Manager to drive service and message virtualization, you can:

- Create rich virtual data, tailored to specific test cases, using defined rules, recorded models, or templates.
- Create a model of HPE ALM requirements or test cases, and use it to generate responses which cover the full range of scenarios, as needed for effective service virtualization.
- Provide distributed test and development teams with the stable environments they need, free from cross-system dependencies and constraints.

To learn more about visit CA Test Data Manager
ca.com/us/devcenter/ca-test-data-manager



Connect with CA Technologies at ca.com



CA Technologies (NASDAQ: CA) creates software that fuels transformation for companies and enables them to seize the opportunities of the application economy. Software is at the heart of every business, in every industry. From planning to development to management and security, CA is working with companies worldwide to change the way we live, transact and communicate – across mobile, private and public cloud, distributed and mainframe environments. Learn more at ca.com.

1 The Total Economic Impact of the CA Technologies Test Data Manager Solution, a commissioned study conducted by Forrester Consulting on behalf of CA Technologies, December 2015