WHITEPAPER

Test Data on Demand

Solution: **XDM**

UBS HAINER

Quality Assurance Across Products, Data Sources and Organizational Units

Abstract

In fast-paced software delivery environments, quality assurance hinges on providing relevant test or training data to engineers and quality assurance professionals on demand. XDM is a cloud-ready test data management solution that revolutionizes how organizations distribute test data across products, data sources and organizational units with efficiency, while remaining compliant with industry standards and regulatory prerequisites. XDM features a web-based storefront for use by subject matter experts, testers, and developers, enabling them to repeatably order use case specific test data for their applications with the click of a button, not requiring repeated attention of technical experts. XDM also drastically simplifies and automates the data provisioning process. Engineers can easily define application models spanning all relevant DEV, TEST and QA-environments and databases and on this basis define repeatable and automated tasks while XDM guarantees efficient task execution and load management, seamlessly interfacing with existing systems and continuous delivery pipelines.

Introduction

In today's competitive market, organizations rely on high-quality data more than ever and data management has become a hot topic, since those who efficiently provide the right data to the right people will likely edge out the competition. This is especially pronounced for data analytics products, where performance hinges on the quality of available training data, but it has always been the case for software products in general. Software quality cannot be ensured without carefully engineered test data, allowing subject matter experts (SME), testers and developers to validate functionality, performance, and security. To facilitate this, an organizational divide must be navigated: expert knowledge about business (edge-)cases that need to be tested often resides almost exclusively with SME and is passed on to technical team members on a need-to-know basis. However, engineers hold critical information about underlying dependencies and specifics of how the data is stored and processed. While diligent teams put emphasis on defining "testable" acceptance criteria for each of their features, the prerequisite of providing consistent and realistic test data in the required volume is often overlooked. Let alone the challenge of having a potentially anonymized or otherwise masked version of said data ready on the relevant test environment at the right time. In recent years, many organizations have adopted agile methodologies or some form of continuous delivery aiming for quick software

Introduction (Continued)

increments, critically increasing the need for readily available “test data on demand”. The complexity and hours needed to engineer such test data are quite commonly underestimated and undervalued.

XDM steps in as a powerful ally to tackle this challenge, resolving organizational barriers between those who use test data and those who provide it, while remaining compliant with industry standards and regulatory prerequisites. XDM revolutionizes data provisioning processes through simplified task management and automation, resulting in optimized utilization of technical resources as well as personnel.

XDM Data Shop and Test Data Finder: A Self-Service Portal for Data Consumers

“I need to quickly verify a bugfix. The bug occurred only for users with the role “Building Owner” in cases where the user owns more than 50 buildings with at least 10 units within the same postcode. To verify, I need to examine the contents of an automated email generated by our software daily at 5 pm.”

A developer or tester tasked with the above is facing a multitude of issues: This happened somewhere in the production environment, but do I have access to a user with the needed properties in one of my test environments? Ideally one where I can generate and check the email immediately? Maybe a colleague has tested the same constellation before, and the required test data already exists somewhere?

If any of the above questions are answered with “no”, they may have to embark on a journey across departments, generating manual work for multiple people: someone with access to production needs to find a suitable user with the specific properties. An admin will need to extract the user – and all required dependent tables - from one or multiple production databases and anonymize certain data (names, addresses, etc.) not relevant to this case. Only then can the data be provisioned into a test environment where automated emails are generated frequently.

XDM as your central test data management hub can significantly expedite this process, drastically reducing manual efforts through its Test Data Finder and Data Shop features. Here’s why it’s a game-changer:

XDM Data Shop and Test Data Finder (Continued)

- Operating on top of a once defined application model, XDM's Test Data Finder intelligently searches for application-specific attributes across relevant databases, ensuring that test data meets the testers' criteria. It can even point out better test data variants.

- In the self-service portal XDM Data Shop, the tester can order the needed Data with the click of a button, immediately triggering automated provisioning into the desired test environment. Execution windows prevent resource overload during peak times.

- Pre-defined task templates allow extraction of the relevant data at row-level including dependent data in all relevant parent and child tables, taking into account any constraints that may exist in the target test environment. Pre-defined masking, validation, and anonymization rules specific to the target environment and the individual tester putting in the order are automatically enforced during every extraction.

Members of individual teams can track which test data was ordered by their teammates. They can re-use it or order a separate copy whenever needed, to ensure they don't interfere with tests currently run by other colleagues.

Tailor-Made Datasets: How Does XDM Know What to Copy and What to Anonymize?

Typically, knowledge required to set up a test data delivery process is distributed between people across multiple departments and teams. XDM empowers each stakeholder to repeatably configure their part of the process, minimizing work created in other departments.

Within one central, user-friendly web interface, the application team defines the relationships between databases and tables and can create so-called "Application Models" to represent these relationships across individual applications and databases. Data privacy officers determine and monitor personal identifiable information (PII) to be concealed before it is copied. The PII finder tool within XDM helps them localize it. Subject matter experts identify relevant and sensitive information and can readily configure XDM to apply tailored masking algorithms to optimize load and performance. Finally, interactions with external pipelines, monitoring and alert-generation can be customized centrally by an operations or test data management team.

Tailor-Made Datasets (Continued)

To guarantee seamless collaboration, built-in access control enables admins to precisely configure access for user groups specific to the respective organization. XDM also comes with dozens of pre-defined masking algorithms for common attributes (names, addresses, bank details) that can be easily customized.

Maintaining compliance at all times trough "Configuration as Code", the XDM configuration is documented in a human-readable, comprehensible and traceable format. XDM comes with internal logging functionality and can be integrated into existing monitoring solutions.

XDM Ensures Efficiency and Repeatability to Empower Automated Testing

Automated tests rely on a well-defined state as a starting baseline to ensure repeatability. Only then meaningful, comparable test results can be obtained and automatically evaluated against previous executions.

XDM workflows facilitate scheduled cloning of entire databases (including permissions etc.) or copying selected sets of tables repeatedly and efficiently at defined times to ensure a fresh start whenever needed. Even complex data provisioning processes involving multiple systems can be represented. Run multiple tasks in sequence or define complex logic: XDM workflows will handle the entire process, from extraction to deployment and reporting.

Multiple generations of test case data can be stored using XDM's Icebox component, making it easy to keep track of test data versions. This facilitates testing a new software version against current and future database configurations or vice versa. An Icebox generation contains both data and structures, allowing for a reversal of structural changes in the target environment if desired. Both mass data and individual test case data can be stored.

Streamlined Configuration & Operation Minimizes Administrative Overhead

While ease-of-use for developers, testers and SME are central to XDM, usability must not come at the cost of increased configuration, administration and operation expenditure.

Streamlined Configuration and Operation (Continued)

Hence, significant effort has been made to guarantee:

- **Compatibility**: XDM is compatible with many Database Technologies, including DB2 z/OS, DB2 LUW, Db2 for iSeries, Oracle, IMS, SQL Server, and PostgreSQL. In addition, it offers a generic JDBC interface allowing it to be used with other DBMS such as IMS, ExaSol and MySQL. It also has an additional component for use with VSAM and CSV files.

- **Containerization**: XDM is deployed via Docker to make the installation and update process easy. It can be integrated into platforms like Kubernetes. Existing ecosystems and continuous delivery pipelines are integrated through its REST API.

- **Lightweight configuration**: Off the shelf, XDM comes with a standardized set of configuration parameters. For most use cases, only minimal deviations from these standards are necessary. Setup will mostly consist of spinning up the respective docker containers, and ensuring communication between them and the existing ecosystem is possible (i.e. configuring access to source and target systems). It is however possible to customize XDM as needed.

- **Configuration-as-Code**: XDM can be configured to use a Git repository as source. The Git repository in continuously monitored and any changes on the Git files to the XDM installation are automatically applied. In this case XDM objects can not only be created via manual clicks in the UI, but also via the code in Git.

- **Easy Monitoring**: Enterprise architects gain visibility into resource usage and bottlenecks through the XDM web interface, including insights about all past, pending and currently running processes. The XDM web interface also includes a Grafana-based dashboard that shows the current memory consumption, disk space and CPU utilization.

- **Detailed Reporting**: XDM generates detailed reports and logs about every test data provisioning process, describing the settings used, the outputs of XDM's modules, as well as the exact changes made to the target databases.

UBS Hainer's support doesn't stop after initial setup. The XDM team will assist with out-of-the-box examples and best practises based on over 25 years of experience. Depending on customer needs, a support model can be set up, where our experts accompany the integration over several weeks or months, from building the application models to ensuring the solution is operationalized to guarantee an optimal return on your investment.

Conclusion: XDM Streamlines Your Quality Assurance Process

XDM isn't just about copying data—it's about getting the right data to the right people at the right time - enabling truly seamless testing and thereby improving not only quality and stability but also change lead times, resulting in a significantly reduced time-to-market.

Visit us at ubs-hainer.com/product/XDM and contact us today to start your successful test data management journey.

For more information, please contact:

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