SOLUTION BRIEF

USING TEST DATA MANAGER TO SPEED SAP S/4HANA UPGRADES

Locate, Mask and Generate Test Data for SAP S/4HANA Environments for improved feature testing and migrations

The Challenge and Solution — At a Glance

Having the right test data at the right time is crucial to developers and testers for application development, QA and product updates. Companies that utilize packaged applications such as SAP often perform rigorous testing prior to performing a version upgrade. This is necessary to avoid serious disruption to their supply chain activities when upgrading their production system. Support for SAP from a testing perspective has been limited in the past due to the proprietary nature of the SAP database.

To help clients perform test data management functions in an SAP S/4HANA environment, Broadcom Test Data Manager, in partnership with Infosys, has utilized client connectivity API's such as JDBC, ODBC and SQL from SAP. Infosys brings 16,000 SAP Experts and 4500 Data Engineers serving 450+ clients globally. They have executed 100+ large TDM engagements across the globe using their specialized services practice group and have built specialized IP to identify sensitive fields in SAP. Using the ML algorithm they have developed dynamic masking techniques specific to SAP role-based data access. Infosys provides service support to SAP data provisioning needs on Azure, AWS, and GCP platforms, along with and has developed chatbots for data selections from multiple SAP tables. For multiple customers, they have implemented RPA based techniques for TDM process automation. Using CI/CD integration, they have prepared a zero-touch platform for invoking SAP data provisioning jobs at runtime .

The integration between Test Data Manager and SAP S/4HANA brings a new level of support to help companies test features prior to an upgrade. A test data engineer can find and mask SAP test data or generate new test data synthetically. The tester can use the TDM portal to find and reserve SAP test data for their particular testing purposes. This streamlined process allows teams to manage the SAP testing process, especially during migrations and upgrades.

Key Benefits

> Connect and locate data within the SAP/4HANA database

> View referential integrity (foreign key and primary key values)

> Automate test data identification

> Mask test data from the SAP S/4HANA database

> Copy data objects using Javelin

> Maintain compliant data (GDPR, HIPAA, PCI, etc.)

> Achieve faster TDM implementation using the Infosys accelerator kit with relevant metrics, templates and process checklists.

> Increase productivity in data validation by 25% by using Infosys Data validation Tool.

> Increase productivity in SAP data mining and creation activity by 30% using Infosys utility Simulacra.

> Reduce effort in SAP synthetic data creation by 25% using Infosys ITS Self-test tool

> Increase productivity in SAP synthetic data generation by 25% using Infosys Query generator macro utility.

> 25% reduction in test data costs through automation and reuse

> 40% time saving in test data masking

> 30% increased productivity with TDM governance

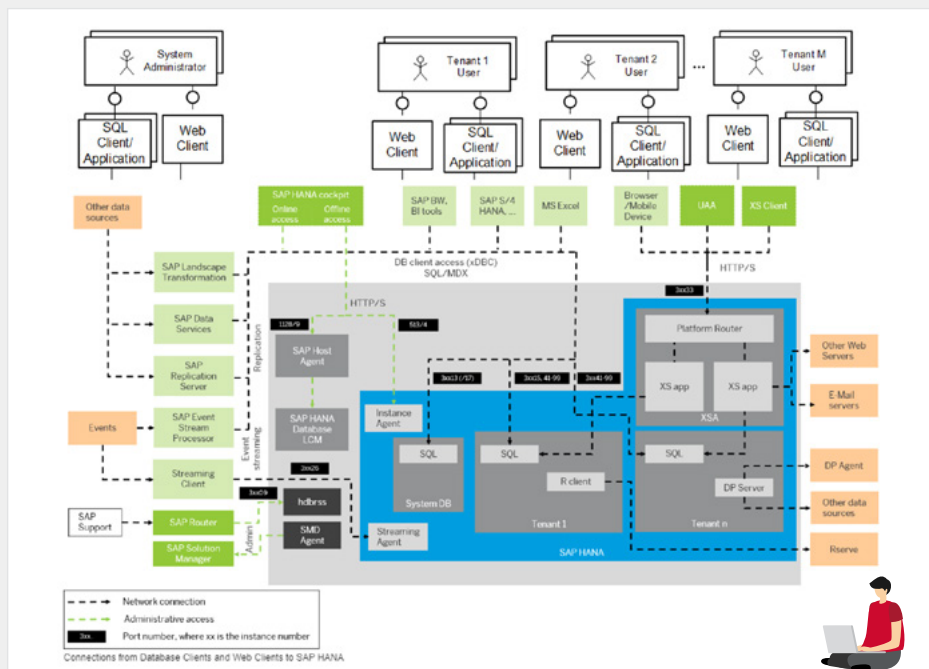> 90% cycle time reduction for test data availability

FIGURE 1: TDM and SAP integration employs the SQL Client/Application layer and the JDBC, ODBC API's for communication.

SOLUTION BRIEF

SAP S/4HANA —
Enables a new level of test data management

Support for SAP from a testing perspective has been limited over the years due to the proprietary nature of their database. The release of SAP S/4HANA and their browser-based tools and API's has opened up new access to SAP data. This means that IT, developers and testers have more ways to view, extract and manage SAP test data. It also means that tools such as Broadcom's Test Data Manager can be employed more easily to speed the testing and customization of SAP.

SAP S/4HANA offers simplifications, increased efficiency, and compelling features that customers are looking for in this newest version. The clock is also ticking for users of previous SAP versions which is causing many to look at the pros and cons of upgrading. However, the upgrade process can be slow and painful and this is where doing the right testing with the right test data becomes absolutely essential.

As part of any upgrade process, a company must identify and rank all the functions of their application and determine their priority for testing. They may look at the number of transactions performed during a certain timeframe to determine which ones are used the most or have the greatest impact on the business. Once they have a priority list, they can begin to test these aspects of the SAP system. Efficiently performing tests, results in a faster upgrade. Therefore, the use of Test Data Manager to quickly find, build and manage test data becomes a key component in the upgrade process.

IInfosys and Broadcom have collaborated to help customers address their challenges and transform how they locate and generate test data for SAP environments. **Some of the main capabilities of this solution include:**

- **Automate processes and improve testing cycles** – Quickly locate and evaluate data within the SAP database for testing purposes

- **Subset and mask test data** – Quickly subset and mask (obfuscate) SAP data for any variety of testing needs

- **Clone test data** – Retain core characteristics of the data, and maintain cross-application integrity when copying test data

- **Generate synthetic data** – Create test data from scratch that matches the characteristics of your original SAP data

- **Generate negative test scenarios** – Generate outliers that can stress test your applications beyond using good test data

- **Audit and mask PII data** – Identify sensitive data within your SAP database and mask it for compliance needs, generate reports that show you where sensitive data resides

- **Find and Reserve data** – Locate and reserve a list of pre-fetched SAP test data through the TDM portal.

- **Deliver test data through a self-service portal** – Testers can view and access the test data they need. Test data engineers can configure what test data the testers will see and use.

About Infosys and Broadcom:

Broadcom and Infosys are partners towards a common goal—Empower Digital Business Success for our clients. This is leveraged by combining the technology leadership of Broadcom with the deep domain expertise of Infosys.

Infosys

Infosys brings together knowledge of industry best practice from years of experience delivering large-scale transformational programs to identify and address business challenges. The Infosys S4/HANA Adoption Framework (ISAF) platform provides quantifiable value discovery that helps you navigate the complexities of managing test data to make sure you cover all your IT bases: business process systems, architecture, technical, UI, and beyond. From industry-leading toolsets to tailored approaches, Infosys makes ERP transitions and transformations a success.

Broadcom

Broadcom's Test Data Management solution is an advanced test data management system that allows testers to locate, build and manage SAP test data through a web-based portal. Combined with Infosys's deep experience with SAP deployments, this new solution provides end-to-end support for test data management, in-sprint testing and more. Employ a single point of reference for all test and development efforts.

TDM Solution for SAP — End State View

The envisioned end state view of TDM solution consists of an end user (Dev / Test / Business) facing test data portal which abstracts core test data management activities. End users are able to consume TDM services in a self serviced manner thereby reducing efforts and any unnecessary overheads in data provisioning process.
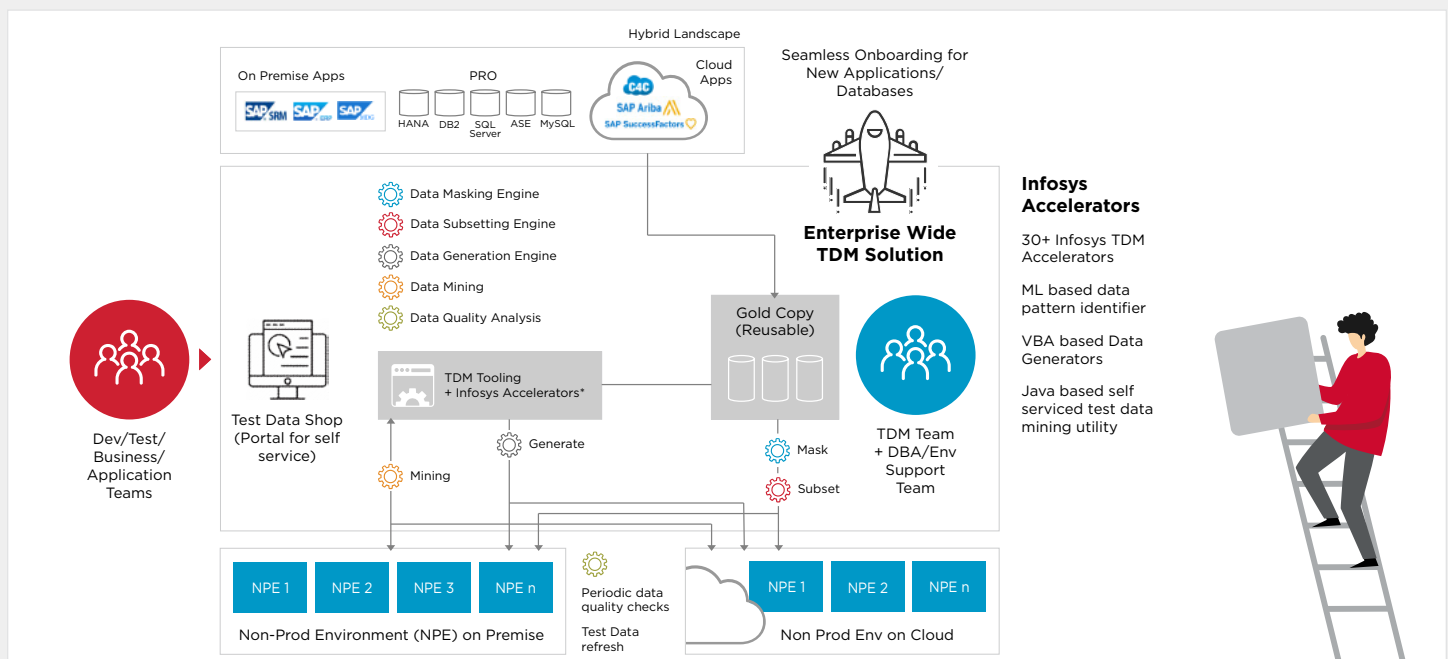
TDM core services include:

> **Data Masking** – Removing sensitive content and ensuring compliance to data privacy regulations

> **Data Sub-setting** – Creating right size data subsets ensuring test data scenario coverage

> **Data Generation** – Synthetically generating real like fictive test data sets

> **Data Mining** – Identifying right test data based on test scenarios/test cases

> **Data Quality** – Periodic assessment of test environment to ensure integrity and correctness of test data

> **SAP Test consulting** – Analyze the SAP business requirements, identify sensitive SAP fields, provide specifics on Logical relationship between SAP tables and fields which is required to complete aforesaid SAP TDM activities.

The end state solution extracts data from production environment into staging (called as gold copy). Data is consistently masked in gold copy. Masked data is then loaded on to the test environment either on cloud or on premise in the desired quantity (with subsetting). Data mining solution helps retrieve right test data sets from the test environment based on test criteria. Additionally, synthetic data can be generated into the test environment based on test requirements. Data in test environments will be periodically refreshed to ensure availability of quality test data.

Ready to Use Industry Process Hierarchy

Process Automation Recommendations

Business Roles and Persona Recommendations

Best Practice Business Process Flows

Business Process Dependencies

FIGURE 2: Empowering Digital Business Success

Diagram

On Premise Apps
SAP SRM, SAP ERP, SAP CRM
HANA, DB2, SQL Server, ASE, MySQL

PRO

Cloud Apps
C4C, SAP Ariba, SAP SuccessFactors

Hybrid Landscape

Seamless Onboarding for New Applications/ Databases

Enterprise Wide TDM Solution

Data Masking Engine
Data Subsetting Engine
Data Generation Engine
Data Mining
Data Quality Analysis

Dev/Test/ Business/ Application Teams

Test Data Shop (Portal for self service)

TDM Tooling + Infosys Accelerators*

Gold Copy (Reusable)

TDM Team + DBA/Env Support Team

Mining
Generate
Mask
Subset

NPE 1 NPE 2 NPE 3 NPE n
Non-Prod Environment (NPE) on Premise

Periodic data quality checks
Test Data refresh

NPE 1 NPE 2 NPE n
Non Prod Env on Cloud

Infosys Accelerators

30+ Infosys TDM Accelerators

ML based data pattern identifier

VBA based Data Generators

Java based self serviced test data mining utility

SOLUTION BRIEF

SAP TDM Use Case
Test Data Management Solution for Hybrid (Cloud / On-Premise) SAP Ecosystem

Use Case 1:
Data Subsetting, Data Mining & Data Masking

Use Case 2:
Data Generation, Data Masking & Self Service for TDM functions

Use Case 3:
Data Generation for Transaction & Master records & Data Mining

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Requirement: Data Subsetting and mining of data from SAP tables for Purchasing process with Goods Receipt scenario and perform Data Masking.

SAP Systems: SAP Ariba and S4 HANA on premise

Solution Provided:
Used Data Generator capabilities of TDM portal to perform data mining and subsetting for multiple transactional data to test:
- GR/IR for open PO
- Outgoing Payment & GR/IR clearing for incoming invoices
- Automatic Clearing on GR/IR accounts

Used in-built TDM Data profiling features to identify relevant fields for masking for Suppliers.

Successful validation of masked data in SAP Ariba and S/4 HANA on premise system.

Validated if referntial integrity is maintained for masked sensitive field.

Benefits using TDM
Reduction in data identification effort by 30%

Storage space saved by 60% due to strong subsetting principles

Ensure compliance to data privacy regulations

Requirement: Synthetic data generation, identify data from SAP HANA on premise tables for masking and utilize self service for test data availability.

SAP Systems: SAP HANA Cloud and SAP ERP on premise

Solution Provided:
Synthetic data generation using in-built TDM algorithms.

Used Data Discovery feature of TDM to identify relevant fields for masking from SAP tables such as BNKA, LFB1, SKA1, EKPO, etc.

On demand availability of Test data using Self Service feature of the tool.

Performed Data masking in compliance with data integrity and GDPR guidelines.

Successful validation of masked data in S/4 HANA Cloud & on premise systems.

Benefits using TDM
Streamline data masking process ensuring safety and security of Data

Discovery features of the tool identified 30% more sensitive fields for masking

40% effort saving in Data Masking

Requirement: Synthetic generate master data such as Business Partner (Customers) and use the records to perform metering to cash process in SAP ISU.

SAP Systems: SAP Cloud for Customers (C4C) and SAP HANA ISU

Solution Provided:
Created Business Partner (Customers), using TDM and validated in SAP ISU tables such as BUT000, BUT100, etc.

Validated created Business Partners in SAP C4C.

Using created BP, performed customer record setup for move-in process.

Used TDM Data Mining algorithms to perform validation of records in SAP ISU system.

Performed Billing and Invoicing in SAP ISU using extracted record from TDM.

Benefits using TDM
Test Data Services across hybrid SAP landscape

25% Reduced Data Cost with Reusability and High Availability of Data

100% Assurance with improved Test Data coverage

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