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Make Technology Work

ENHANCING CUSTOMER INSIGHTS: DATA-CENTRIC QA DRIVES RETAIL AND E-COMMERCE SUCCESS FOR CLIENT'S 360-DEGREE VIEW

PROJECT OVERVIEW

The retail giant manages a deluge of customer data from stores, POS devices, online transactions, items bought, and more. This amount of data was kept in various databases for at least five years and was organised by brands, transaction type (online or in-person), account management-related information, and operational data for specific products. Although data is operating in a "logical" silo, the retailer was unable to see an integrated customer view because it was difficult to map the appropriate data points from each database to feed into a customer intelligence engine.

SOLUTION DELIVERED

ETL testing and Big Data testing

CLIENT DOMAIN

Retail, E-commerce

KEY HIGHLIGHTS

- Streamlined end-to-end ETL process data validations, reducing the effort from 8 hours to less than an hour using a custom automation framework.
- Significant time savings were achieved, improving operational efficiency and allocating resources to other critical business tasks.

ABOUT CLIENT

Our client is a multinational retail business that generates revenue exceeding $4 billion. The company operates a diverse range of brands through various channels and adaptable business models. Customers can purchase personalized apparel from a wide selection of brands, rent outfits, or even order custom-made clothing tailored to their individual specifications.

BUSINESS CHALLENGES

To gain a Customer 360 perspective, the retail company needs to analyze customer data from various sources. This includes store data, POS units, online transactions, and product purchases. However, this data is stored in different databases categorized by brands, transaction modes, account management, and product operations. Despite operating in separate silos, the retailer faces challenges in visualizing a comprehensive customer view and mapping the relevant data points for their Customer Intelligence engine. They aim to analyze customer journeys, sales values across categories, and transaction dynamics, predict behaviors, forecast product demands, and design effective marketing campaigns.

- Big Data ETL tools lack a user-friendly GUI interface.
- Manual assessment of data quality after transformations are challenging.
- Real-time data transformations further complicate the process.
- There is a need for automated validations to ensure data integrity.

SOLUTION HIGHLIGHTS

- Subject Matter and ETL Expertise: Indium Software's team included a Retail subject matter expert and ETL expert who understood the data workflow, transformations, business objectives, and system performance factors.
- Full-Stack Team: The employed team possessed a range of skills, including knowledge of Retail, expertise in ETL, proficiency in Big Data Technologies, experience in different Testing Environments, and proficiency in Test Tools.
- Collaboration with Data Scientists and Warehouse Architects: Indium's testers worked closely with Data Scientists and Warehouse Architects, gaining high-level domain understanding for various projects.
- Automation Scope for Reconciliation Tests: The team defined an automation scope for Reconciliation tests, reducing the manual effort required to cover 50 metrics from 8 hours to less than an hour using a custom automation framework.
- Detailed Test Scenarios: Test scenarios were meticulously documented in standard templates for each testing type.

TECH STACK

AGIL**ONE** ORACLE

MySQL △ UNIX

Data stage (ETL),
Defect Management Tools,

Indium Software's Team employed Retail subject matter / ETL expert to comprehend the data workflow, transformations, business objectives and the performance factors of the system.

| Create ETL Test Plan & Estimation | Design Test Cases & Prepare Test Data | Test Execution & Bug Reporting | Automation Scope | Summary & Results Analysis | Test Closure |

ETL Complexity

Data Sources	MDM, Customer data by Source Channel, Product DB
Data Source Types	Oracle DB, MySQL, Flat Files
Customer 360	Dynamic features for Data Target Holding
Transformation	80 Tables with simple-to-complex transformational nature

Test Strategy

Data sets were gathered in batches instead of mass volumes for Test Sprints. Estimations were done accordingly, and test results are produced for each batch.

Batch 0	1 month sample data (recent)
Batch 1	Historic data (5 years)
Batch 2	5 month data (recent)
Batch 3	1 month (most recent)
Batch 4	Incremental data (daily)

TEST COVERAGE MATRIX

Customer 360 ETL Transformation

Scope Of Testing

DATA AGGREGATION
Collective data is maintained in Customer360 using ETL Tools (stored in .CSV files) for better performance

- Production Validation Testing on data being moved to Customer360 for correct order of data
- Flow Tests

CUSTOMER IDENTITY
Data is cleansed and fed into required standard 'formats' before loading into Customer360 using match and merge rules, Identity Resolution Engine, De Duplication for customer information

QA Validations on the data for defined Formats and Layouts
- Source to Target Testing Data
- Acquisition Testing Compatibility

DATA INTEGRITY
Match back from Customer 360 to original Databases

- Data Completeness Tests for
- Transformation

Scope Of Testing

DATA PROCESSING
Apply layered rules to derive/set the context for BI data

Validate the processed data in a temporary database against the rules and context of customer intelligence Data Quality Validations (syntax and reference tests)
- Metadata Testing
- IRE Validations/ De duplication
- Reconciliation Testing and
- Automation
- UAT

REAL TIME DATA
Data flux is real time for daily/weekly campaigns

- Incremental ETL Testing
- Verify data updates from the sources to the aggregate Customer360

ABOUT INDIUM

Indium Software is a fast-growing Digital Engineering company, focused on building modern solutions across Applications, Data, and Gaming for its clients. With deep expertise in next-gen offerings combining data and applications, Indium offers a wide range of services including Product Engineering, Low-Code development, Data Engineering, Ai/ML, Digital Assurance, and end-to-end Gaming services.

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