indium
Make Technology Work

Testing an AI Driven Platform for Asset Management

QA
Services

Success Story

Client

The largest and widest global analytics provider with vast experience and gleaning insights from structured and unstructured data in over 150 countries

Application Overview

Client's Application is an Artificial Intelligence driven platform. It gives automated and actionable intelligence to Asset Management firms at the individual customer level in the form of personalized action recommendations and channel strategies. It enables personalized nurturing, drive customer growth and lifetime value, customer acquisition, valuation management, attrition, loyalty, offer decisions and interaction strategies.

This AI centric product is deployable On Premises. Implementations include several Machine Learning (including DeepLearning on GPUs) algorithms working in conjunction with extensive data engineering. The insights/analytics are presented to the end user via our web application or through our Salesforce Application to predict the next set of interactions for every individual customer.

Business Challenges

- Coordinating and driving 4 different teams to work together to maintain the deliveries within the schedule and also performing QA on the same.
- Understanding the DS algorithms and preparation of test data to test.
- Installer testing on cloud and standalone servers.
- Detecting unknown errors during Salesforce integration.
- DB testing with millions of records/data.
- Managing test environments on different servers including cloud.

Technical Requirements

- Validate web application for 3 different users (Admin, Sales and Marketing users).
- Develop and execute Functional, Performance, Regression, Unit, Integration, DB, DS test plans.
- Identify and automate test scenarios of the "Web app".
- Automate the process of Master Controller and QA the same with incremental data for 20 run sequences.
- On – demand QA to execute regression tests for each sprint/release.

Services Offered

Functional Testing | Performance Testing | Regression Testing | UI Testing | Test Automation | UAT/ Production Testing | API/Web Services Testing | Database Validation | Data Science Testing | Installation Testing | Integration testing with Salesforce

Domain

Analytics

Tools

Test management: JIRA| Functional Testing: Selenium, Python | Performance testing tool: JMeter , Django, Angular2, Cassandra, Apache 2, Mod_Wsgi, Rest Framework, SSL, Anaconda, Python, Spider
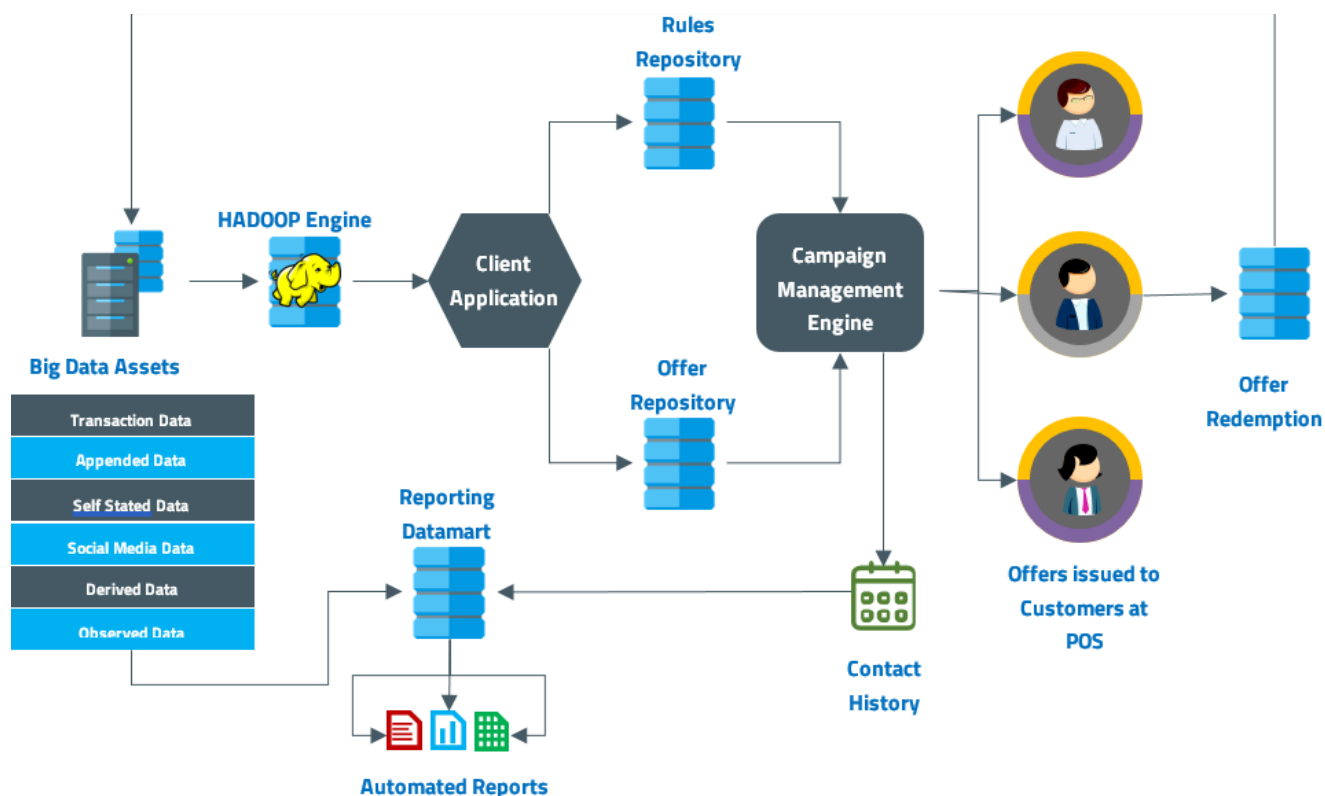
Key Highlights

- Tested the algorithms (used & developed) in DS scripts with real time data Automated EDA module for generation of 100s of business metrics from the raw data
- GPU Implementation of Deep learning algorithms with TensorFlow (Ensemble of CNN, LSTM networks for needs and product prediction)

Key Success

Indium software helped the client at a period of significant uncertainty in the product evolution and wore a very mature hat to articulate how the QA strategy should be established. Several key technical recommendations by us helped shape the client's QA process.

Indium software's adherence to Agile Scrum process and using JIRA helped the client in largely becoming process oriented.

Application Architecture

Data science (DS) Testing

1. Developed 300 DS related test cases

2. Tested 4 markers (Diversification, Responsiveness, Momentum, Email engagement) and its associate signals

3. Tested the algorithms (used & developed) in DS scripts with real time data
- Includes modules for I/O, data processing (pre-and post), automated report generation, validation tests, estimation of confidence metrics, and automated parameter estimation.
- Scalable implementation that can be tuned to meet specific business requirements by simply changing

configuration parameters external to the corresponding algorithms.
- Automated EDA module for generation of 100s of business metrics from the raw data.
- GPU Implementation of Deep learning algorithms with TensorFlow (Ensemble of CNN, LSTM networks for needs and product prediction).
- Reinforcement learning (For action recommendations).
- Probabilistic Learning Proprietary bootstrapping algorithm for behavioral classification under limited data coverage.
- All the implementations work with incremental data to support continuous and adaptive learning by the algorithms.

- Tested the Text mining module developed for handling unstructured text data (conversations, call notes, reports etc.) to support use cases such as 'Investor theme preference', 'Content relevance', etc. The text mining module leverages concepts such as word2vec, doc2vec and algorithms such as LSTM for solving these problems. We have also collected and curated a huge corpus of documents related to the financial industry from the web that we use for training.

Backend Testing (Cassandra DB)

Integrity of data is tested and evaluated on the below items

- Conversion of incremental raw data into LDM (Logical data Model) tables.
- Generation of output data from DS algorithms into tables of DS keyspace.
- Web consumption of data from DS keyspace into tables of Web keyspace.
- Exported millions of records into excel to find the Mean, Average and Median values for Markers across sales users.
- Used Pandas to calculate the Mean, Average and Median values of markers with 15 million records of transaction data.

Functional testing

- Developed an accumulated total of 500 functional test cases for 4 releases (8 sprints).
- Logged 400 functional bugs in JIRA.
- Regression testing is performed on each sprint release covering 400 test cases on Development and demo server.

Engineering side Testing

Installer Testing (Standalone and AWS environments)
Installer – An automated installation tested for Ubuntu 16.04 working on standalone systems as well as AWS, which installs the client's application within 7 minutes with all pre-requisite requirements – Anaconda,

Cassandra DB along with Schema, Java and Web Consumption engine, along with checked out code.

External tool Integration Testing
Integration of the application with Salesforce for consumption of output (Application with Salesforce vice versa).

Process Automation
We used Master Controller to execute ETL and Validation scripts, set of DS algorithms for Signal and Marker Generation and Post Marker generation data.

For each run sequence, 42 processes were run with incremental data based on the scheduled process calendar from DB. Verification of the generation of corresponding data (signals, markers, and data) from the appropriate keyspaces was done by Indium.

Performance testing

Developed JMeter scripts to calculate the Response time, latency for visiting each web page and API hit with various user loads (10, 50, 100, 500, 1000, 10000 users)and compared with bench mark data.

API Testing

Tools used: Advanced REST client, POSTMAN
- Developed 150 test cases to test 60 API's.
- All the API's were tested on each sprint release.
- 124 bugs were logged.
- Tested all the API's with RSA 256 # encryption authentication.

UI Testing

- Developed 250 UI test cases.
- Tested the UI elements in compliance with all the web page templates designed (Alignments, error messages, color, font, size, image clarity, charts and chart values).

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