Mphasis
The Next Applied

AI-powered Due Diligence Platform for Private Equity

Summary

Mphasis is helping one of the top 3 global consulting firms build a due diligence platform for automatic analysis of data and generation of insights in making critical private equity decisions like mergers, acquisitions and investments using AI, NLP and Deep Learning.

The Client

Our client is one of the top 3 consulting firms globally and is developing a private market intelligence platform that helps identify and evaluate private investment opportunities. The platform automates and augments PE diligence through the power of technology and artificial intelligence to deliver high-quality, superior insights at high speed.

Problem Statement

- The first step in conducting due diligence analysis requires gathering market intelligence on companies of interest and performing a comparative analysis of an organization and its services with respect to its competitors. This is presented as diligence report and contains information ranging from company details, finances, aggregated customer sentiment of its products and services, factors of importance informing key purchase decisions and comparative analysis of target, and competitors based on these factors.

- The research and analysis to create and compile such a market intelligence report typically takes around 3-4 weeks, and is a manual exercise. It involves going through thousands of customer reviews from trustworthy sources to understand factors that matter to customers and their significance, product and services portfolio of the target and competitor companies, and running excel-based historical data analysis presented in charts, graphs, etc., for insights.

- The client wanted to develop an AI-powered Due Diligence platform that augments and accelerates this research and automatically generates reports that can then be validated by senior analysts for accuracy and precision.

- They recognized the power of Artificial Intelligence and engaged with Mphasis to leverage Natural Language Processing (NLP), Machine Learning and Deep Learning methods along with the computing power and cloud infrastructure provided by AWS, to design and implement this automated due diligence platform.

Partner Solution

To bring the vision of this automated Due Diligence platform to life, the client partnered with Mphasis for our expertise in AI and Machine Learning. The objective was to develop an AI-powered platform that end-customers can use to request for research. Analysts can use this to generate automatic insights using ML and DL algorithms that identify key topics and sentiments from customers' verbatim and aggregate insights over target and competitor firms - giving a holistic view of the market sentiment and comparative opinion of an organization of interest.

The idea was also to retrain and scale the learnings of one domain to develop models of new domains with minimal training data and human intervention.

Key Solution Highlights
The AI-enabled diligence system designed and implemented by Mphasis has the following highlights:

- NLP-based ML models to identify factors of importance (e.g., customer service) from customer reviews across different firms in one industry segment (e.g., financial services)
- Computes importance of these factors across target and its competitors
- Context-based Deep Learning models to predict such factors in incoming customer reviews and predict sentiment per customer review
- Evaluates sentiment distribution per factor to understand the net sentiment of a factor, e.g., if the net sentiment towards 'Customer service' or 'Quality of product' is positive or negative
- Metrics-based rules to automate the selection of customer quotes that support the insights and analysis of customer sentiments
- Cross-comparison of firms (e.g., software or financial services firms) across these factors
- Company disambiguation algorithm for record linkage and de-duplication across data sources
- Automatic creation of company profile slides from a curated, reliable and growing database of companies across industries
- Identifies and predicts success factors that play an important role for employees working for an organization using active and transfer-learning techniques
- Evaluates employee sentiment across these success factors like work culture, management, compensation, etc.
- ML-based short text classification models customized for survey responses from primary research
- Leverages incremental learning techniques to adapt and translate the learnings from one industry and retrain new ML models for other industries with minimal intervention

- ML pipeline workflow for continuous model enhancements, monitoring and maintenance
- Auto model selection pipeline to automatically trigger training, evaluation and cross-comparison of different ML and DL model architectures on onboarding new domain data
- Scales the platform for new domains with the use of incremental learning and auto model selection pipeline

AWS services leveraged for solution building
- **AWS Cognito** - To authenticate users to use SageMaker GroundTruth labeling service
- **AWS SageMaker Ground Truth** - Custom UI created for labeling data. Authenticated users can label and create a training dataset.
- **AWS Lambda** - Data pipelines and triggers are setup using AWS lambda
- **AWS SageMaker** - Jupyter Notebook Instance with training pipelines
- **Deep Learning AMIs** - Large language models trained using available Deep Learning AMIs
- **S3 bucket** - ML model and data artifacts are stored in S3
- **Kubernetes Service (EKS)** - Scalable services hosted in EKS for:
  - Fetching raw data from external sources
  - Platform backend APIs
  - Webserver
- **AWS Translate** - Raw data requires translation to English
- **AWS Elasticsearch** - Parsed raw data pushed to Elasticsearch for indexing and analytics
- **AWS RDS** - PostgreSQL acts as the core data store for ML predictions
- **AWS EC2** - Dedicated EC2 for hosting ML Inference services (on GPU) and Jenkins pipelines
- **AWS CloudWatch and Notification Service** - Monitor logs and raise alarms based on events
- **AWS Systems Manager** - Parameter store for all services on the platform. Helps coordinate services.
- **AWS Secrets Manager** - AWS SDKs are authorized via secrets manager
- **Load Balancer and Route 53** - Web address for the platform and manages multiple user sessions and requests
- **Router & NAT Gateway** - Communication between public-private subnets and external networks
- **IAM** - Creating roles for access between systems and users

Results

- **Powered by advanced analytics** and state-of-the-art Machine Learning models, the Due Diligence platform now enables and serves Private Equity customers and consultants across domains in the automatic generation of elaborate and deep-dive due-diligence reports with the click of a button

- **Automation enabled** through the platform brought in approximately 90% efficiency

- **Reduced the manual and cumbersome task** of extracting manual insights from review data and automated the same using large scale language models, leaving the consultants to focus on more intelligent tasks

- The consultants can now focus on just validating and cross-checking the results before sharing them with private equity clients

- The platform incorporates millions of data points from various reliable market sources and can process them at scale to provide insights, predictions and estimations at once

- Research exercises that can take weeks and sometimes months for a team of consultants to perform manually can now be done in a few days

- The automated Due Diligence platform can now serve many more customers at once and at speed as opposed to the previous manual method of research

About Mphasis

Mphasis' purpose is to be the "Driver in the Driverless Car" for Global Enterprises by applying next-generation design, architecture and engineering services, to deliver scalable and sustainable software and technology solutions. Customer centricity is foundational to Mphasis, and is reflected in the Mphasis' Front2Back™ Transformation approach. Front2Back™ uses the exponential power of cloud and cognitive to provide hyper-personalized ($C = X2C^2_{TM} = 1$) digital experience to clients and their end customers. Mphasis' Service Transformation approach helps 'shrink the core' through the application of digital technologies across legacy environments within an enterprise, enabling businesses to stay ahead in a changing world. Mphasis' core reference architectures and tools, speed and innovation with domain expertise and specialization, combined with an integrated sustainability and purpose-led approach across its operations and solutions are key to building strong relationships with marquee clients. Click here to know more. (BSE: 526299; NSE: MPHASIS)

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