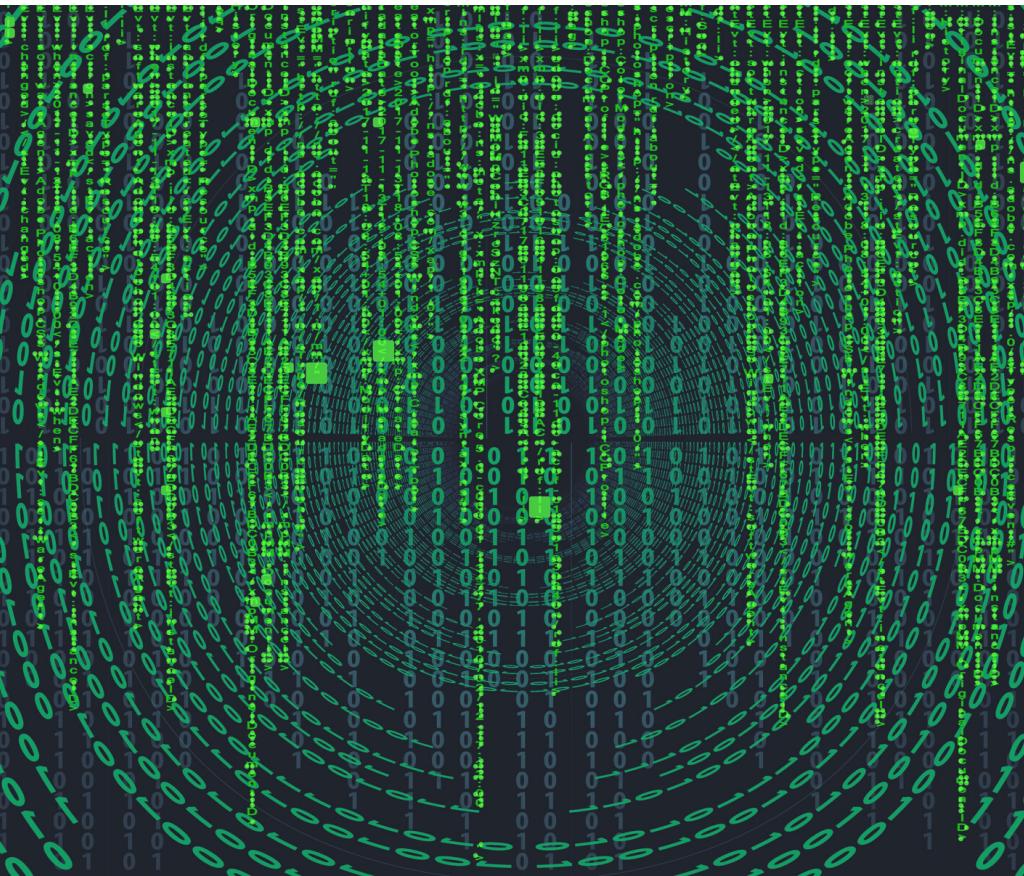


Case Studies

H A N D B O O K

A GUIDE TO DATA ANALYTICS IN DIFFERENT SECTORS



P R E D I C T I V E A N A Y T I C S

CONTENT



TRANSPORTATION



GOVERNMENT
HEALTHCARE



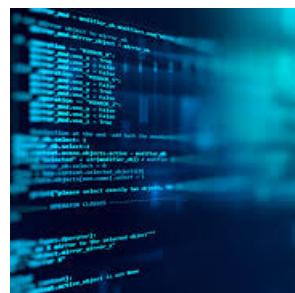
MEDIA, NEWS &
ENTERTAINMENT



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BEVERAGE



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CONTENT



29 OIL & GAS

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01 | TRANSPORTATION





Substantial Fuel Costs Saved & Data Wrangling Reduced By 60% (Southwest Airlines)

Situation Summary

Southwest Airlines Co. is a large-scale airline company that began as an intrastate Texas airline in 1967. Today, Southwest carries more domestic passengers than any other US airline. It has services to 101 locations within the US and operates in 10 foreign countries. During its peak travel season, it can operate 4,000 departures a day. Southwest is well-known for being the world's largest low-cost airline

Like many airlines, Southwest Airlines has to manage and forecast its fleet of aircrafts. This means ensuring that its flights both depart and arrive on time. The aircrafts must be properly managed so that they are put in the right places at the right times for their intended flight schedules. Southwest must forecast and anticipate customer demand for their services to ensure that they are running their flight operations

as efficiently and as profitably as possible. Crew members' locations and schedules must also be effectively managed to prevent drops in operational efficiency. All of these elements leave plenty of room to locate areas where its services or operations can be made even more efficient and can potentially save a lot of money in terms of operational costs.

For Southwest Airlines, this means the management and forecasting of 700 aircrafts flying to more than 100 national and international locations through around 4,000 flights each day. On the tech side of things, more than 100 terabytes of data and many analytic applications are already being used in these forecasting and management projects. When a new analytics platform was set to be piloted in 2016, the fuel cost was picked as the platform's project

focus. Each year, Southwest Airlines spends around \$4–\$6 billion: fuel costs are the company's second-largest expense. With costs that high, even a minor percentage improvement can lead to a huge amount of savings for Southwest's operations.

The Solution

Before the pilot started, fuel cost forecasts were generated by pulling data from several different systems and compiling them into spreadsheets of monumental size. Fuel costs were forecasted each month of the year, with Southwest's team creating 1,200 forecasts for fuel demands monthly. A single finance analyst would have to spend three days every month to process the data into the fuel cost forecast, which weren't always as accurate as the company would have wanted.

For the fuel consumption pilot project, Southwest sought out Alteryx Designer and R to work out eight different predictive models, including models for neural networks and time series regression. The Alteryx Designer platform was able to create 9,600 forecasts each month for each airport during the pilot run of the project. Through machine learning and other AI techniques, the platform was able to save Southwest substantial amounts of money, optimize many aspects of the fuel cost forecasting process through automation and put various streams of data into a single, automated platform.

The Results

Southwest Airlines' pilot project with Alteryx Designer led to several notable benefits for the company:

- 9,600 forecasts generated for each airport every month through automation
- Freed up time for financial analysts who previously spent three days creating (sub-optimal) forecasts
- Substantial fuel costs saving: the exact figure is proprietary and wasn't released to the public
- The time that needs to be allocated for data wrangling was reduced by 60% Forecast accuracy was increased
- The fuel purchasing process was sped up

- Allowed Southwest to negotiate a better fuel purchasing deal from a single Southern California vendor rather than working with several different vendors
- The project won the Lebow College of Business at Drexel University Award

Business Use case

Forecast Fuel Consumption

A. Description - This use case describes how Southwest Airlines uses machine learning to forecast fuel consumption. The use case begins when Financial Analyst pulls in data and ends when a forecast of the consumption is generated.

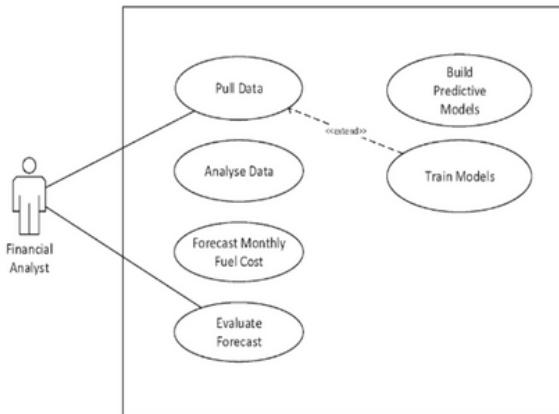
B. Actors/ Primary Actor(s): Finance Analyst Supporting Actor(s): Ariba, Southwest's enterprise data warehouse Offstage Actor(s): N/A

C. Pre-Conditions + Post-Conditions

Pre-Conditions Historical data on estimated number of trips, month, fuel price etc. exists. Predictive models that included time series regression modeling and neural networks exists. Post-Conditions Data model is updated with the forecast consumption data

D. Main Success Scenario Actor Intention Financial analyst pulls in data Fuel cost is forecasted Forecast report is generated Success Scenario Monthly consumption forecast is generated

E. Industries +Functions Industries
Airline Functions BudgetingF. Business Use Case Diagram



Use case diagram

Technology Specifications

Technology Specifications
Important note: These specifications detail the data technologies this organization and/or vendors are publicly known to be utilizing. The technologies listed below are not meant to be a complete, exhaustive list of the technologies required to implement this use case. Furthermore, the technologies listed below may not in fact be relevant to implementing the exact use case at-hand. Caveat emptor.

100s Of Millions Usd Saved Per Year (Ups)

Business Use case

Route Shipments

A. Description - This use case describes how UPS Engineer uses Network Planning Tools (NPT) to route shipments to the facilities with the most capacities. The use case begins when the engineer logs on to the NPT platform and ends when pickup is scheduled.

B. Actors/ Primary Actor(s): Primary Actor(s): Engineer Supporting Actor(s): N/A Offstage Actor(s): Customer

C. Pre-Conditions + Post-Conditions

Pre-Conditions - Data on shipping variables such as package types, destinations, weight, volume and delivery deadline exist. Post-Conditions - Algorithm updates based on feedback from customers satisfaction and costs.

D. Main Success Scenario

Actor Intention Engineer logs on to NPT to see package routes. Available hubs for diversion are presented. Engineer diverts package to another hub. Notification is sent to engineers at the receiving hub. Package sorting instruction is issued. Outbound packages are grouped into smallest numbers. Plane or truck pickup is scheduled. Engineer decisions are analyzed for improvement Success Scenario. An appropriate route forecast is presented

E. Industries +Functions Industries

- Logistics
- Freight

Functions - Route planning

Technology Specifications

Important note: These specifications detail the data technologies this organization and/or vendors are publicly known to be utilizing.

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Built an Early Warning System to Predict Financial Crises (SEC)

Situation Summary

The Division of Economic and Risk Analysis (DERA) is a part of the US Securities and Exchange Commission (SEC), a federal government agency tasked with protecting investors and with ensuring that the securities markets operate fairly and with minimal disruptions or issues. DERA was formed in September 2009, in the wake of the global financial crisis of 2007–2008, and it was assembled to incorporate intensive data analytics and financial economics into the SEC's core mission. Accordingly, DERA operates in many areas of the SEC's functions, including rulemaking, examinations, policy-enforcing and enforcement. DERA also works together with other divisions of the SEC to identify, assess and take appropriate actions in the face of certain trends and risks.

DERA and the SEC went through a series of improvements with their analytical programs and techniques that are designed to work with very large amounts of data. These programs are driving forces behind surveillance initiatives and innovations in the SEC's market risk assessment programs. Over time, DERA and the SEC at large realized the impact that data-driven machine learning approaches have on the ability of regulators to better understand the likeliest outcomes of various sorts of investor patterns and actions.

The emergence of big data, such as data related to the many investing actions that people take every day, created new challenges and new opportunities for the SEC's machine learning methods to be improved. These improved machine learning methods were recently incorporated into risk assessment programs and other significant initiatives that DERA and the SEC engage in.

The Solution

The SEC began working with machine learning as the global financial crisis was just beginning. Back then, the organization worked with methods such as simple text analytics, regular expressions and simple word counts. The SEC tested these methods by assessing corporate issuer filings in an attempt to determine if its agents could have predicted the risks that credit default swaps (CDS) would soon pose. The text analytics method was used to machine-measure how often these CDS contracts were brought up in corporate issuer filings. Trends were then examined over time and from many different corporate issues to conclude if there were any indications of imminent risk from the rising use of CDS that might've been factored into an early warning announcement.

The Results

Overall, this simple text analytics method was crudely constructed and didn't perform exactly as originally intended. However, it proved that this machine learning method could be fruitfully applied to SEC filings. The SEC had obtained the following results from its machine learning method:

- The text analysis showed that CDS contracts were first mentioned in 1998, in a Form 10-K by three banks.
- The number of CDS mentions by corporate issuers had risen to over a hundred.
- A notably higher amount of CDS mentions and disclosures were observed in 2009. However, this was due to the financial crisis already well underway.
- Mentions of CDS by the press were relatively insignificant until 2008.

- The SEC's machine learning system processed lead paragraphs, headlines and major news outlet articles' full texts during the years before the financial crisis. In 2008, the number of CDS articles increased 10 times over compared with 2007.

This initial data-focused trial created new chances for the SEC's machine learning systems to work with a lot of data and to improve its computer algorithms' abilities to pinpoint associations. These algorithms depend on large sums of data to make more associations and become more accurate with their predictions.

Currently, the SEC is striving to scale up their applications at much higher levels than previously possible. Market exchanges are already reporting their transactions to the Consolidated Audit Trail (CAT) system, with broker-dealers following suit in the future. The SEC also uses the Hadoop computation clusters to process extravagant datasets, such as the Option Pricing Reporting Authority (OPRA), processing the digital equivalent of around 500 million documents per day.

SEC's staff strives to use machine learning to enhance the information obtained from registrants and market participants. Machine learning systems will be used to gather high-quality data from corporate issuer financial disclosures, investment company holdings, equity market transactions and from security-based swaps.

>33% Increase in Relevant Research Findings (Cambridge University)

Business Use case

Analyze Research Papers

A. Description - This use case describes a researcher's (at the University of Cambridge) use of a literature-based discovery (LBD) system to identify intermittently linked associations for cancer research in published literature. The use case begins when a researcher enters the search query text in the interface and ends when mention of the researched concept is returned to the researcher.

B. Actors/ Primary Actor(s): Primary Actor(s): Researcher. Supporting Actor(s): N/A. Offstage Actor(s): N/A

C. Pre-Conditions + Post-Conditions

PRE-CONDITIONS:LBD model is deployed via web-based user interface or programmable API. POST-CONDITIONS N/A

D. Main Success Scenario - Researcher enters search query text. Text is disambiguated into concept ID Search query is executed on concept graph. Graph result is returned to Researcher. Researcher navigates concept graph

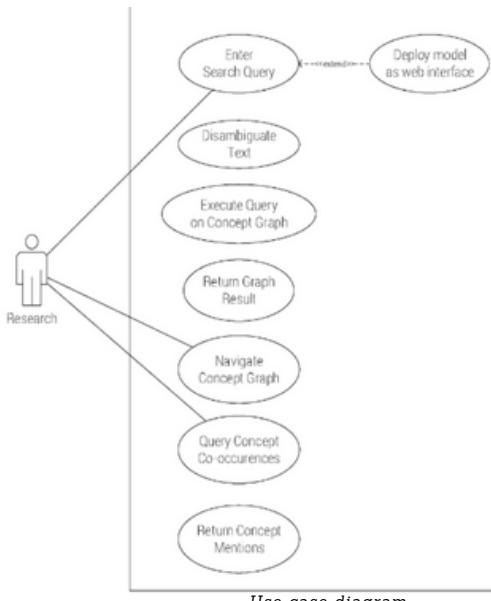
E. Industries +Functions Industries

- Academia
 - Pharmaceutical.
- Functions- Research and development

Technology Use case

Important note: These specifications detail the data technologies this organization and/or vendors are publicly known to be utilizing.

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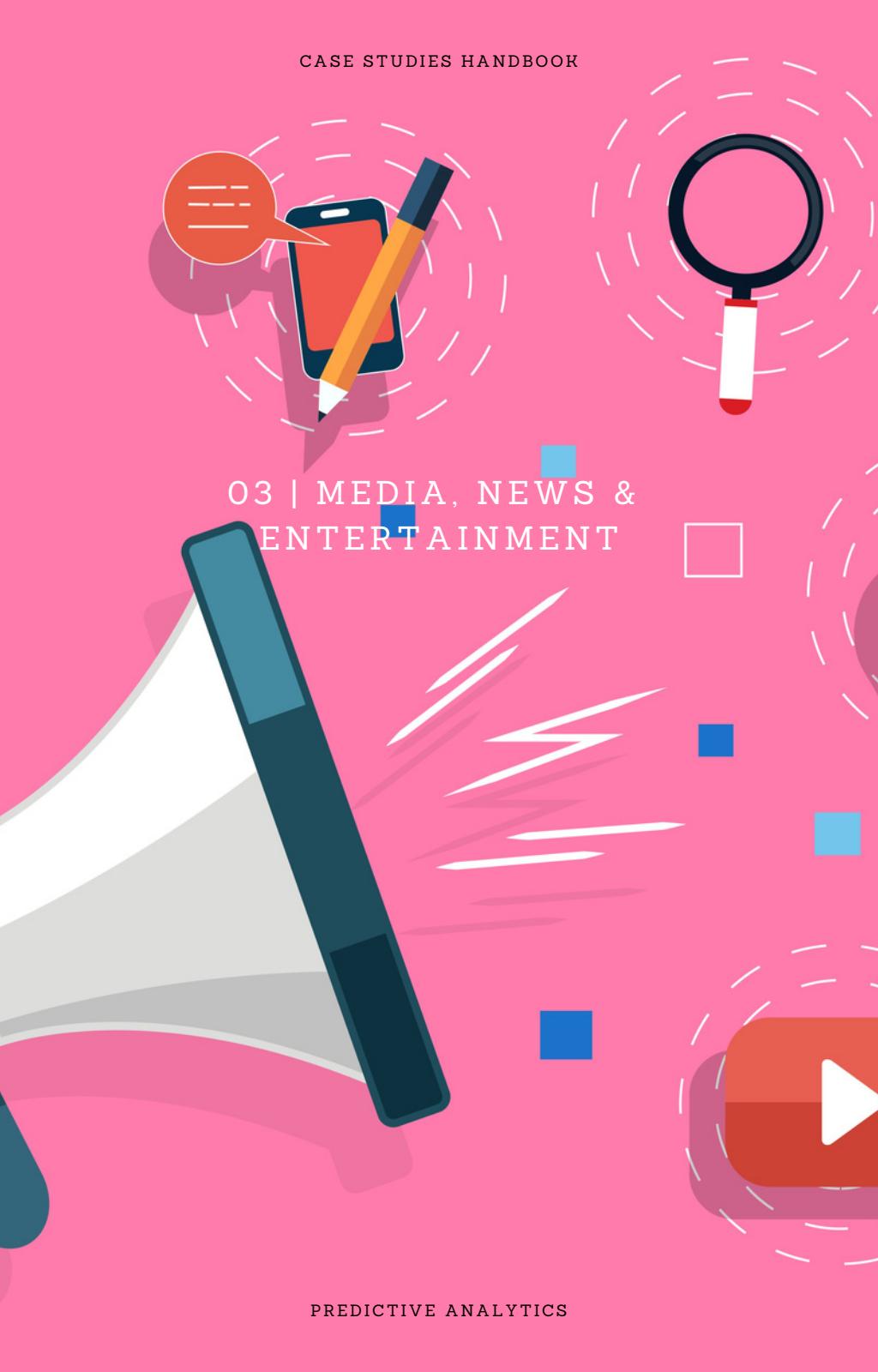


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03 | MEDIA, NEWS & ENTERTAINMENT

Grew Loyalty / Rewards Program To \$1 Billion USD (Caesars Entertainment)

Route(s): Marketing
Industry: Media, News & Entertainment

Situation Summary

Caesars Entertainment is a gaming company that runs a large number of high-end hotels and casinos in many domestic cities and 54 international locations. In Las Vegas, it is the company with the most active development, which includes the Linq project: open-air dining, retail and entertainment anchored by a massive observation wheel, the largest in the world.

Caesars is heavily invested in the activities of its customers, as these activities can give the company a better sense of what visitors are coming to Las Vegas for. In 2012, 40 million people took a trip to Las Vegas, but very few came specifically or primarily to gamble at casinos such as Caesars'. Most repeat visitors claimed that pleasure and vacation were why they had come back to Las Vegas: only nine percent primarily came to gamble. With new visitors to Las Vegas, a mere one percent of them came to gamble at Las Vegas' casinos.

To get a better sense of what new and return visitors and Caesar customers were doing in Las Vegas, Caesars Entertainment launched a loyalty program now known as Total Rewards. Billed as a means of customizing and enhancing the guest experience, it is capable of tracking customers' gaming and non-gaming behaviors, including actions taken concerning entertainment and dining.

The Solution

Caesars Entertainment became a Las Vegas pioneer in terms of its data analytics capabilities and uses. Using the Total Rewards program, the company tracks customers through videos, emotion recognition software, transactional data, win/loss records and other types of data.

All of this data is used by the Total Rewards software to create improved pricing decisions, menus and floor arrangements through customer segmentation.

As of 2013, over 45 million members were having their entire Las Vegas trip monitored and analyzed to encourage more spending and to improve customer loyalty.

The Total Rewards program gives away beneficial deals such as show tickets, limousine rides, meals and room upgrade to customers who purchase items or play games at Caesars' gambling areas and resorts. Customers spend money on various items and activities hosted by Caesars, and in return, they are placed into increasingly higher reward tiers.

Meanwhile, Caesars gains information about the kind of person a given customer is and the kind of activities that the customer does while using the company's facilities. The seven-star tier is the top reward tier, in which the customer gains complimentary airfare and a complimentary stay at a Caesars hotel for up to four nights. Customers at the seven-star level spend more than \$500,000 with Caesars in a year alone.

Caesars Entertainment offers a variety of activities: gaming, shows, spa treatments, shopping and dining are the most prominent among them. All of these activities provide valuable customer data for Caesar's analytics team. This team then uses the data they collect from customers and the Total Rewards program to track why regular patrons have suddenly stopped coming, how best to arrange a casino's gambling tables and what the best pricing options would be for its hotels.

The analytics behind the company's customer service platform is a 200-strong team located in Las Vegas' Flamingo Hotel. Each Caesars customer's trip is tracked in real-time. Representatives can provide complimentary hotel stays or meals as consolation prizes for players who strike out on a few gambling machines or tables. That is, they will do so if the underlying analytics report that this investment is likely to result in the customer returning to spend more down the line. The all-important metric being tracked is the customer's "lifetime value.

The Results

Caesars Entertainment claims the following results from its Total Rewards Program:

- Caesar's ability to track total customer expenditures with the company increased from 58% (2004) to 85% in 2013
- The Total Rewards Program is valued at \$1 billion

Caesars is committed to leveraging data and analytics to learn more about its customers and improve the experiences they have at its facilities.

15-Fold Increase in News Stories Generated (Associated Press)

Route: Operations

Situation Summary

The Associated Press (AP) is an industry leader in terms of journalism and news media. This organization employs thousands of TV and radio broadcasters and roughly 1,400 daily newspapers around the US. Beyond the impressive amounts of news that AP provides, it is also an organization well-known for its style. Professionals in the fields of journalism and in other industries regard the AP Style as the quintessential writing standard.

For many years, the Associated Press' reporters had to report on the corporate earnings of US public companies every quarter, a very time-consuming and stressful process. AP sought out a data-oriented automation solution that would free up their reporters' time, giving the reporters a chance to focus more on reporting quality news content.

The Challenge

Reporting on these quarterly corporate earnings created a number of external and internal problems for AP and its many reporters. Externally, AP's main issue was the sheer volume of US public corporations that report their earnings, numbering in the thousands. Internally, the AP reporters were faced with a daunting task each quarter. These business reporters would have to grab data from corporate earnings press releases, copy them, place them within pre-written templates, add headlines and then promptly publish them. These actions needed to be performed quickly and, in the mornings, so that stock traders would be adequately informed on whether they should buy or sell a given stock.

On top of this process being time-consuming and unpleasant, the AP reporters would only manage to create around 300 news stories of these corporate earnings each quarter.

Thousands of US corporate earnings went uncovered in AP's news outlets, meaning that many traders lacked the information that they needed. Each quarter's news stories were crafted by taking financial information from the earnings reports of as many US corporations as the reporters could manage. The stories for many companies went untold. Eventually, AP decided that it needed to find a better way for the sake of its reporters, its customers and the company at large.

The Solution

One reason for AP's ability to last so long compared to other news organizations is its recognition of the need to take advantage of new technologies and strategies. AP thus turned to automation as an innovative potential solution to its reporting problems.

AP had a plan that would lead to their reporters spending much less time on gathering data and numbers, instead devoting more time to producing high-quality articles and stories for its customers and subscribers. AP was able to put their plan into action with Automated Insights' Wordsmith platform. Wordsmith uses natural language generation (NLG) to convert collected data into a written out, plain-language story. It can turn data from a corporate earnings report into an article worthy of being published at AP in only a fraction of a second.

Wordsmith's products were able to meet AP's standards because the platform's team was able to customize the NLG engine in a way that matches AP style.

AP applied Wordsmith into different sections at first. Over time, the Wordsmith platform was put through extensive and intensive testing, steadily reducing the error rates in the automated AP earnings reports.

Eventually, testing was conducted on the automated earnings of corporations from Canada and from Europe.

The Results

AP working with Automated Insights' Wordsmith platform resulted in the following achievements:

- Produced 4,400 quarterly earnings stories.
- Increased story generation rates by nearly fifteen-fold.
- Freed up around 20 percent of the time that was spent by the reporting staff creating earnings reports each quarter.

The Associated Press took a problem and turned it into an opportunity to produce higher volumes of high-quality articles through automation. Through the automated NLG capabilities of Automated Insights' Wordsmith, they converted raw corporate earnings data into thousands of AP news stories, creating many more stories about corporate quarterly earnings than previous efforts performed manually.

Grew Loyalty / Rewards Program To \$1 Billion Usd (Caesars Entertainment)

Route(s): Marketing

Business Use Case

REWARD CUSTOMER FOR VISIT TO CASINO

A. Description - The system in the casino continuously captures data about the customer. The system adds relevant reward points to the customer's account based on customer's purchase of products and services. The system associates a reward tier with the customer.

B. Actors/ Primary Actor(s): Primary Actor(s): System. Supporting Actor(s): Customer Offstage Actor(s): Casino Manager

C. Pre-Conditions + Post-Conditions

PRE-CONDITIONS; The customer has an account with the casino. Customer Data exists in a data store. Data quality is such that the system can use it to select a model and produce accurate results.

POST-CONDITIONS; Information on customer's visit to the casino is collected. The customer's reward points, and applicable rewards program tier are updated as appropriate.

D. Main Success Scenario

ACTOR INTENTION (BASIC FLOW)

- 1.An existing customer visits the casino.
- 2.The system tracks the following data for the customer.
 - Travel arrangements to the casino. Arrival and departure timeline.
 - Types of activities undertaken in casino. Duration spent in dining.
 - Dining Preferences.
 - Duration of stay in hotel
 - Accommodation preferences
 - Duration spent in other activities. Number of Companions

3.The system adds relevant reward points to the customer's account.

4.The system checks the total points in the customer's account

5.The system maintains the same reward tier or upgrades the customer to a higher reward tier based on the total points.

04 | FOOD AND BEVERAGE



15% Reduction in Restocking Trips (Coca-Cola)

Route(s): Operations

Business Use Case

Place Products in Vending Machine

A. Description - The AI solution prepares a planogram (i.e. a visual plan of where each product should be placed within the vending machine). Based on data collection and analysis, it can customize each vending machine to maximize profit. It can also do a what-if analysis on new products to help the retailer decide whether or not the product should be introduced in the vending machine.

B. Actors / Primary Actor(s): Primary Actor(s): System Supporting Actor(s): Retailer Offstage Actor(s): Customer

C. Pre-Conditions + Post-Conditions

PRE-CONDITIONS;

- Vending machines exist and are operational
- The system is able to collect data points for the vending machine.
- The system has trained models to analyze and prepare a product placement plan

POST-CONDITIONS;

- The system suggests a planogram (i.e. visual plan of where each product should be placed within the vending machine). The retailer implements the visual plan

D. Main Success Scenario

ACTOR INTENTION (BASIC FLOW)

1.The System collects data points for the vending machine. Some data elements collected are:

- Location of Vending Machine
- Demand Trend
- Sales Data
- Inventory Data etc.

2.The system builds a planogram which is a visual representation on how the products should be placed to ensure optimum sales.

3.The online retailer selects the best planogram for the vending machine and applies it to the vending machine.

4.The system suggest price for each product in the vending machine based on demand.

5.The online retailer selects price points for each item in the vending machine.

ALTERNATE FLOW (WHAT-IF ANALYSIS FOR A NEW PRODUCT)

- The retailer introduces a new product in the system
- The system runs a "what if" analysis program for the new product
- The system generates results on product placement, expected sales etc. for the new product.
- The retailer decides on product placement in the vending machine.

SUCCESS SCENARIO

The vending machine has items displayed in a manner to maximise sales. The price for each item is adjusted based on data analysis so as to maximise sales.



Significantly Decreased Their Fraud Rates (Western Union)

Situation Summary

Route(s): Finance, Operations
Industry: Finance / Credit Companies

Western Union is the go-to company in terms of sending money to other people for many individuals around the world. The giant financial and communications company offers customers ways to send funds to people over the phone, in person and through the Internet

Western Union wired over \$300 billion at the request of its customers to their intended recipients in over 200 countries and in 130 currencies. The service completes around 32 financial transactions per second.

All this financial success comes at a cost, however. Criminals have improved their methods to steal other people's money, whether in person, through phone calls or by using online devices. The most damaging criminal schemes for Western Union have been fraud and account takeovers.

Losses from fraud might account for up to 5% of a financial company's transactions. The benchmark figure for Western Union's financial sector hovers around 1.2%. That may seem like an inconsequential number, but it actually means billions of dollars in lost revenue that financial companies like Western Union must absorb as a cost of conducting its operations.

Due to its effect on company profits, firms like Western Union have significant incentives to prevent and fight fraud whenever possible.

Western Union uses multiple ways to battle fraud, including verifying the identities of money senders and recipients. However, authentication techniques that are effective for in person transactions won't work for digital transactions, including debit and credit card funding, transfers between online accounts, digital bill payment and mobile app payment transactions.

Another major problem is account takeover, which occurs when someone gains unauthorized access to another person's credit card account and then wires themselves money. Email scams and scams run by family members to exploit a relative of their funds are also issues that Western Union must watch out for. They also fight fraud to reduce their liability, increase their compliance and to protect their image as a company that can send customer's money safely and securely.

The Solution

Digital money transfers are a high-value target for those committing fraud, and Western Union has used a variety of digital tools to continue the fight against it. They first used a rules-based system to determine whether they would approve or decline a given transaction. Eventually, they moved on to use a suite of services, including Statistical Analysis System (SAS) tools, the Jupyter data science notebook, open source Python and R tools and H2O.ai. Over time, Western Union's data science division shifted, adding people with business backgrounds into their group of PhD-wielding data scientists. A decision was reached in early 2017 to find a common platform that people from various academic backgrounds could work together on. This decision would lead to Western Union selecting Cloudera Data Science Workbench (CDSW).

Upon a money transfer order being initiated, the request is sent to the CDH cluster, which sends back its determination of whether the order is authorized or not. In the background, many different machine learning models review many variables and perform calculations to determine the reliability

of the potential sender and the probable risk posed to the company by accepting the transaction.

The Results

Western Union's approach with CDSW has led to a significant drop in fraud rates. They claim that their current rate is substantially lower than the industry standard of 1.2%, 120 basis points.

Machine learning looks backward, but fraud is a dynamic activity. Western Union continually tracks for new ways that fraudsters are trying to overcome the obstacles posed by their fraud prevention systems, including transaction location, amounts and transaction destination. To stay ahead of the fraudsters, Western Union will continue to improve its data science program, such as incorporating neural networks and deep learning technology.

Significantly Decreased Their Fraud Rates (Western Union)

Business Use Case

A. DESCRIPTION

The use case describes how Western Union determines the legitimacy of a payment transaction using Cloudera's machine learning algorithm. It begins when a payer initiates a payment transaction and ends when Cloudera's algorithm determines the legitimacy of the transaction.

B. ACTORS

- Primary Actor(s): Cloudera algorithm
- Supporting Actor(s): Payer, Payment Engine
- Offstage Actor(s): Transaction Monitor

C. PRE-CONDITIONS + POST-CONDITIONS

PRE-CONDITIONS1.

- Transactional and behavioral data of payer exists
- Cloudera is trained to identify and react to patterns in the data
- Cloudera model is integrated with Payment Engine

POST-CONDITIONS

Cloudera is updated with the new data from suspicious transactions

D. MAIN SUCCESS SCENARIO ACTOR INTENTION

1. Payer initiates a payment transaction.
Payment Engine routes transaction to
Cloudera algorithm
Cloudera algorithm determines transaction
legitimacy
Cloudera provides response to Transaction
monitor

SUCCESS SCENARIO 1. Legitimacy of a transaction is determined

E. INDUSTRIES + FUNCTIONS INDUSTRIES

Payment

FUNCTIONS

Fraud Monitoring

Upon a money transfer order being initiated, the request is sent to the CDH cluster, which sends back its determination of whether the order is authorized or not. In the background, many different machine learning models review many variables and perform calculations to determine the reliability

30-70% Increase in Business Processes Automation (Deutsche Bank)

Route(s): Finance, Operations

Industry: Finance / Credit Companies

Situational Summary

Deutsche Bank is a German financial services and investment bank headquartered in Frankfurt, Germany. In 2018, Deutsche Bank was ranked 15th overall in terms of total assets. It is Germany's largest bank, and it is a DAX stock market index component. This company operates in Europe, Asia and the Americas, serving 58 countries. As a universal bank, it serves three primary roles: Asset Management (DWS), Corporate & Investment Banking (CIB) and Private & Commercial Banking (PCB)..

Deutsche Bank, like many other banks around the world, has a high volume of actions and financial transactions that are still paper-based or are still performed manually. Some key functions that Deutsche Bank wanted to make more automated were cash operations, tax calculations, loan operations and trade finance. Very large gains in productivity and efficiency can be found in the creation of automated processes.



Usecase diagram

To find a solution for Deutsche Bank's many, repetitive manual tasks, the company turned to a kind of technology known as robotic process automation (RPA). RPA technology is already creating results such as more efficiency in mid-and back-office processes

The Solution

Deutsche Bank turned to its Innovation Lab to create automated solutions for its many manual processes and functions. This objective led them to Work Fusion, an AI automation software provider.

A major issue for the team was that Deutsche Bank, like most other banks, is undergoing a process of technological modernization, incorporating elements such as workflow modernization resources and software package upgrades.

These sorts of modernization processes created incremental change that was very expensive to undergo and would take an extensive amount of time to finally deliver. In the meantime, the company was stuck with a great many manual activities still in place. Deutsche wanted ways for RPA tools to work together with its workforce to improve efficiency in various business functions that were still being performed manually.

When working with RPA, the Deutsche Bank Innovation Lab and Work Fusion had to teach machines various sets of tasks. The knowledge being taught is encoded through robotic processes and cognitive computing into the machines. Afterward, the knowledge is always there for people to use to improve their skills and to increase efficiencies in various processes. Once the RPA system is implemented, it can assist employees in many aspects of their everyday job tasks.

RPA isn't a simple or fast fix for problems such as what Deutsche Bank was experiencing. Business processes typically have to be overhauled to fully incorporate RPA processes and tools. When the Innovation Lab saw ways to augment a process to bring it closer to digitization, the team worked on those aspects first. Significantly manual processes were left as they were. Instead, they worked on processes that were already designed to be further automated.

Work Fusion worked with the Innovation Lab to create automated solutions for complex tasks such as digitally assessing unstructured data for desired information or recognizing a document's type as it flows into a business process

These teams knew that RPA is sufficient for improving the efficiency of low-level employees. What they shot for was RPA combined with cognitive computing, which freed up valuable time for subject-matter experts who could pursue higher-value functions.

The next part of the implementation process is to use the knowledge encoded in the RPA tools' algorithms to teach employees and customers through intelligent assistants.

The Results

Deutsche Bank reported the following results of working with Work Fusion and its RPA tools:

- Depending on the business process' complexity, automation increased as much as 30-70%
- Decreased the time-length necessary for training employees
- The ultimate goal and real value proposition that Deutsche Bank pursues is RPA working in sync with cognitive computing, efficient workforce management and advanced analytical processes..



Saved 75% Of Overall GPU Cost for Visual Search (Bing)

Situation Summary

Route(s): Operations
Industry: Computer Software

A. DESCRIPTION

This use case describes how a user can do a visual search for products and related information on the retailer's website. The user can input a picture of an item as a search query and the system will display relevant information.

B. ACTORS

- Primary Actor(s): User
- Supporting Actor(s): System
- Offstage Actor(s): Retailer

C. PRE-CONDITIONS + POST-CONDITIONS

PRE-CONDITIONS

- The 'search by image' functionality is installed
- The user has an image to use as a search query

POST-CONDITIONS

The online retailer displays search results relevant to the image input in the search query

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DD. MAIN SUCCESS SCENARIO

ACTOR INTENTION (BASIC FLOW)

- The user accesses the online retailer's website.
- The user uploads an image accessible from the device being used.
- The user selects to Search.
- The system displays related products available for sale and related images in the search results matching the search query.

ALTERNATE FLOW (SEARCH FOR IMAGE FROM WEBSITE)

- The user selects to use the 'Visual Search Box'.
- The user will be able to view a magnifying glass symbol in the top left of the image.
- The user selects an image or part of an image by using the 'Visual Search Box'.
- The user selects to Search.
- The system displays related products available for sale and related images in the search results.

SUCCESS SCENARIO

The retailer displays relevant products on the system for the user to view.



Substantial Improvement in Company's Overall Performance (Shell)

Situation Summary

(Shell)Route(s): Operations
Industry: Oil & Gas

PREDICT MAINTENANCE

A. DESCRIPTION

This use case describes how Shell uses AI platforms from C3 IoT and Microsoft to prevent downtime and improve productivity and efficiency in its operations. The use case begins when data scientists integrate Shell's data and ends when engineers predict equipment failure.

B. ACTORS

- Primary Actor(s): Engineer
- Supporting Actor(s): Developer, Data Scientist
- Offstage Actor(s): N/A

C. PRE-CONDITIONS + POST-CONDITIONS

PRE CONDITIONS

Shell data from both corporate systems and equipment in the field exists

POST-CONDITIONS

N/A

TD. MAIN SUCCESS SCENARIO

ACTOR INTENTION

- Data Scientist integrates Shell data
- Data Scientist processes data into unified image
- Developer develops model
- Developer deploys model
- Engineer operates model
- Engineer predicts equipment failure

SUCCESS SCENARIO; Failure of equipment is predicted with high accuracy

E. INDUSTRIES + FUNCTIONS

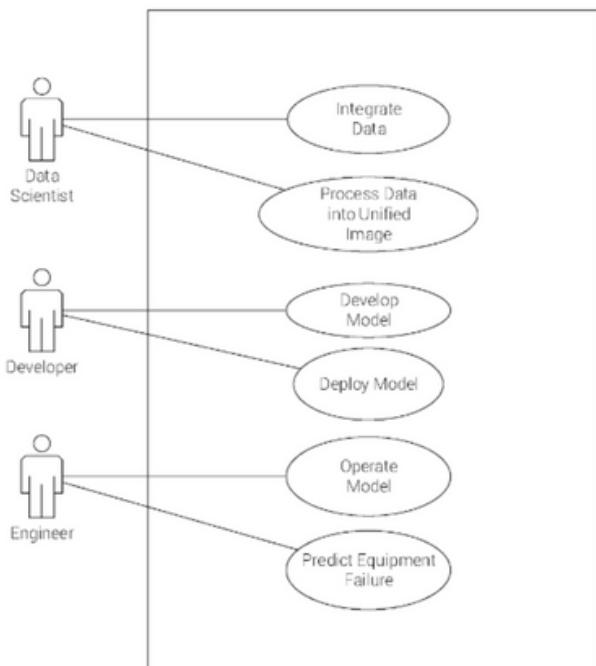
INDUSTRIES Oil and Gas

TECHNOLOGY SPECIFICATIONS

Important note: These specifications detail the data technologies this organization and/or vendors are publicly known to be utilizing.

The technologies listed below are not meant to be a complete, exhaustive list of the technologies required to implement this use case. Furthermore, the technologies listed below may not in fact be relevant to implementing the exact use case at-hand. Caveat emptor.

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Usecase diagram

PREDICTIVE ANAYTICS



PREDICTIVE ANAYTICS