

Data and the Firm

Module 2 - Organizing and Staffing for Analytics

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Lesson 2.0

Overview





Lesson 2.1

Banking and Financial Institution Examples



Banking and Financial Institutions



Business-specific analytic solutions

Fraud detection

Credit risk

Personalized banking

Regulatory compliance

E-banking conversion

Lending

Investments

Opportunity:

Expand revenue opportunities, through big-data lake and related resources.

Data and analytics:

Populated domain-specific objects from their data lake.

Mined merchant data to develop precise pricing models.

Results:

Annual revenue boost of \$8-15 million by more intelligently pricing customers.

\$2.5 million saved eliminating hardcopy financial statements.



Opportunity:

Overcoming challenges with integrating, storing, and processing big data.

Data and Analytics:

Integrated 150TB of semi-structured and unstructured data from its real-time billing platform.

Results:

10-fold increase in marketing upsell campaign conversion rates.

A complete, near real-time view of each prospect's credit risk profile to determine credit viability.

5-fold increase in data integration development versus hand-coding.



Opportunity:

Detect a range of financial and operational fraud via a single platform.

Data and Analytics:

Real-time access to customer information to detect suspicious behavior.

Results:

Check fraud detection improved 95% and fraud alerts increased by 60%.

Internet fraud loss-to-turnover ratios improved to 80%.

No need to add additional staff.

Opportunity:

Needed to perform advanced analytics on financial transactions to trace patterns, predict, & prevent fraudulent activities.

Data and Analytics:

Filtered by geography and within high-volume transaction bracket to automatically flag transactions.

Results:

Increased ability to identify and interrupt potentially fraudulent transactions by 40%. Stopped more than US\$37.7 fraud transactions to date.

Realized a 72% reduction in consumer fraud complaints in one year.

A Major Financial Trading Firm

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Opportunity:

Huge price arbitrage opportunity in securities lending if real-time price data made available to traders.

Data and Analytics:

18 different data sources need to quote best price to brokers from other banks looking to cover short sales.

Traders previously dependent on weekly reports that took one analyst 10 hours to build and led to stale pricing information.

Results:

Additional \$2 million a year generated from instant access to pricing

Primary Capital Mortgage

Opportunity:

Needed instant access to mortgage portfolio risk to assess purchase decisions and sales performance.

Data and Analytics:

One billion annual loans funded across three different types of databases. Account execs now get real-time self-service visibility.

Results:

Reduced time tracking loan status data from 1-2 hours down to 2-5 minutes per day.

Opportunity:

Create defensible revenue forecast models to pass Comprehensive Capital Analysis and Review (CCAR).

Data and Analytics:

Correlated and analyzed 2600 macro-economic variables.

Shortened the variable selection process from three months to two weeks.

Results:

Achieved the cleanest Federal Reserve test pass of top US banks.

Citi stock added \$9 Billion in market capitalization the following day and announced a dividend increase of 500%.

Opportunity:

Expand the breadth and depth of market coverage.

Data and Analytics:

Earnings data on thousands of companies.

Natural language market reports generated via Narrative Sciences.

Results:

Increased site traffic, broadened audience acquisition to increase ad revenues.

Expanded to cover more than 600 stories each earnings season versus dozens previously.

Opportunity:

Needed a solution which could analyze withdrawal data from 1100 ATMs to forecast activities and make better decisions.

Data and Analytics:

Implemented a solution that integrates disparate operating concepts from manufacturing and logistics as well as operations research techniques to optimize cash loading problems.

Results:

40% reduction in cash sent back to the bank along with 20% reduction in trips to replenish the network.

Cash-outs are down by more than 80%.

30,000 hours of customer wait time have been eliminated.

Opportunity:

Prevent corporate credit card customers from cancelling.

Data and Analytics:

40 predictive models analyzing 18 months of historical transactions and 115 variables including: the customer's industry, annual revenue, number of merchants paid, number of corporate credit cards, and charge points.

Results:

Identifies 24% of Australian corporate accounts that will close within four months.



Lesson 2.2

Insurance Examples



Types of Insurance Businesses

Life

Health/medical

Property

Specialty

Reinsurance

Mortgage

Title

Types of Insurance Analytic Solutions

Actuarial analysis/underwriting

Property risk (e.g fire)

Property value

Claims processing

Fraud detection

Loss Ratio

Premium pricing

Investments

Opportunity:

Personalized claim management platform which can also optimize the resources and time.

Data and Analytics:

Organized claims into different risk categories.

Facilitated investigation and mediation of each claim.

Results:

50% of claims are accelerated through improved categorization.

15% (54,000) claims can now be processed in less than an hour, representing a 95% reduction in claims processing time.

Opportunity:

Process a higher percentage of claims faster.

Data and Analytics:

IBM Watson's content analytics module deployed to analyze 50 million custom policies consisting of 28,000 combinations of policy terms.

Results:

Claims now are processed 25 times faster.

Rimac can now process 100% of claims, up from 1% previously.

Infinity Insurance



Opportunity:

Save and make money by reducing fraudulent auto insurance claims.

Data and Analytics:

Predictive analytics against years of historical claims and coverage data.

Text mining adjuster reports for hidden clues, e.g. missing facts, inconsistencies, changed stories.

Results:

Improved success rate in pursuing fraudulent claims from 50% to 88%, and claim investigation time by 95%.

Additional \$12 million in subrogation recoveries.

AlfaStrakhovanie (Russian Insurer)



Opportunity:

Needed a solution to better segment its target customers.

Data and Analytics:

Features like tracking, custom dimensions, and ecommerce helped identify which users were attracted by ads, the policy options they wanted, and the policy prices.

Results:

Doubled transaction rates.

Segmented its customers into groups and reached each group with a data-driven policy price.



Lesson 2.3

Retail Examples



Types of Retail Businesses

Grocery

Clothing & Accessories

Department Store

Online

Discount

Electronics

Food

Home goods

Specialty

Etc.

Types of Retail Analytic Solutions

Market analyses

Pricing & promotions

Customer

Competitor

Product mix

Inventory management

Stock turnover

Distribution channels

Store design/layout

Customer service

Opportunity:

Early detection of quality issues with products.

Data and Analytics:

Analysis of inventory, customer returns, and sales data at granular level: by store, product, color, weight, packaging, etc.

Results:

Early detection of damaged product. Vendor provided credit for all damaged products and markdowns on all sold products for \$1M+ over 6 months.

Opportunity:

Better react to changing market conditions with near-real-time product pricing.

Data and Analytics:

Sales, inventory data on 73M items; 50% annual data growth.

Results:

Reduced time to price items from 27 hours to about one hour.
70% hardware cost reduction.

US Convenience Store Chain



Opportunity:

Develop ongoing forecasting process by market product category.

Data and Analytics:

4 years of historical sales data.

1M+ external data series analyzed.

89 predictive models.

Results:

95-98% monthly accuracy.

Identified leading drivers of major inventory items.

Opportunity:

Consolidate varied product offering.

Data and Analytics:

Customer's social profile, brand affinity, recent activities, household, and macroeconomic data.

Results:

In 6 months time, revenue share was up 24.9% and conversions shot up by a staggering 217%.

Opportunity:

Accurately forecast fluctuating sales orders.

Data and Analytics:

Near-real-time and historical customer data.

Identify patterns in demand.

Results:

30 percent increase in a sales order fulfillment; also reducing the response time.

Russian Electronics Company



Opportunity:

Improve forecasting accuracy.

Data and Analytics:

1.5M point-of-sale transactions per month for 420 product groups and sales of 8000 products from 400 stores.

Predictive analytics models.

Results:

Ability to create 500 predictive models per month.

10% improvement in forecast accuracy leading to improved inventory management, pricing, sales, and staffing.

The Iron Cactus



Opportunity:

Improve in-store customer experience.

Data and Analytics:

Historical video feeds from existing security cameras.

Results:

Heat maps identified customer wait times, enabling the businesses to improve store flow.

Optimized relative product placement.

Opportunity:

Help online users to find what they're looking for more quickly.

Data and Analytics:

Product and category popularity scores are generated from social media feeds using text mining.

Machine learning-based semantic search capability from the clickstream of 45M online shoppers per month.

Results:

10-15% increase in online shoppers completing a purchase (reduction in cart abandonment).

Opportunity:

Gain free strategic advice on promotions, stocking, and so on from CPG partners.

Data and Analytics:

Place billions of rows of POS, inventory, promotion, and other data into a cloud-based data store.

Results:

Dollar General was able to eliminate its complex, expensive RDBMS-based enterprise data warehouse.

Major Yard Care Product Company



Opportunity:

Grow revenue through improved targeting and cross-selling yard care products.

Data and Analytics:

Layered POS and warranty customer data with map data to identify customers that have large foliage coverage and large driveways.

Results:

Improve direct marketing campaign performance.

Formed higher value partnerships with major retailers.

Major Fast Food Company

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Opportunity:

Optimize customer margin and revenue.

Data and Analytics:

Continuously analyze video from drive-through lanes and on the street to identify customer “drive-by” behavior and situations.

Results:

Dynamically updated pricing.

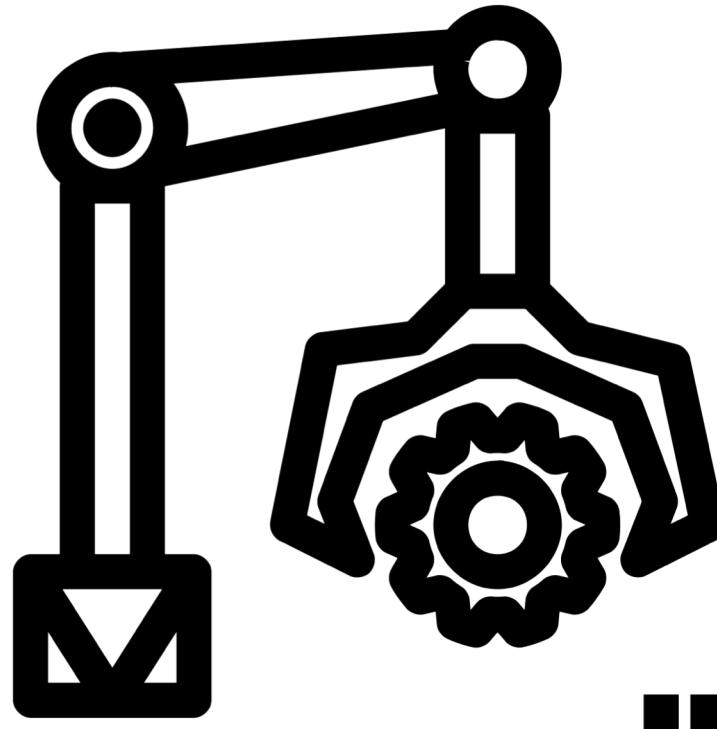
A photograph showing three students in a hallway. In the foreground, two girls are sitting on a bench, looking at a yellow spiral-bound notebook and smiling. One girl has dark hair and is wearing a blue zip-up hoodie. The other girl has glasses and a ponytail, wearing a black jacket over an orange shirt. In the background, a boy in an orange t-shirt is sitting on a chair, looking down at a laptop. The hallway has white walls and doors.

Lesson 2.4

Manufacturing, Consumer Packaged Goods Examples

Types of Manufacturing Businesses

- Industrial
- Semiconductor
- Automobile
- Aircraft
- Sports equipment
- Appliances
- Furniture
- Food



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Types of Manufacturing Analytic Solutions

Supply chain

Supplier management

Machine maintenance

Location

Materials analysis

Process optimization

Safety

Cycle time

Changeover time

Yield

Quality

Opportunity:

Cut costs and reduce time on promotional activities.

Data and Analytics:

Model dozens of data simulations a day with Amazon EC2 which processed 16 TB instances of sales data weekly.

Results:

Saved more than \$900,000.

90% faster simulation deployment.

Opportunity:

Introduce automation and analytics into iron ore mining operation.

Data and Analytics:

200 sensors embedded in autonomous mining trucks feeding 80,000 pieces of data per second to remote operators.

Results:

4x ROI or AU\$500M incremental value per year (including AU\$250K in deferred maintenance).

Asian High Tech Electronics Manufacturer

Opportunity:

Reduce total cost of production.

Data and Analytics:

Product line environmental metrics: humidity, pressure, temperature, and lighting from 1000s of sensors.

Results:

Lower production efficient ratio by 1%+, equivalent to \$US millions per year.

Opportunity:

Create a 1% jet engine and gas turbine efficiency improvement.

Data and Analytics:

Sensors collect 500G of signals on the health of each set of blades across 12,000 gas turbines and engines.

Results:

Reveals patterns on when blades break, enabling GE to tune its manufacturing. Optimized inspection and maintenance processes for turbine customers.

Opportunity:

Reduce high inventories, planning cycles, lead times.

Data and Analytics:

Manufacturing, sales, and inventory data.

Thousands of configuration options of varying popularity and margin.

Results:

Product variety reduced by 61% and days of inventory reduced by 81%

Minute Maid



Opportunity:

Inconsistencies in orange juice due to variations in orange crop, sourcing, and seasonality.

Data and Analytics:

Satellite images, weather, expected crop yields, cost pressures, regional preferences, and detailed data about the 600 flavors that comprise an orange.

Results:

Precise dynamic formula for how to blend orange juice for consistent taste, including pulp content.

After a hurricane or freeze, it can re-plan the business in 5-10 minutes.

Lesson 2.5

Energy Sector Examples

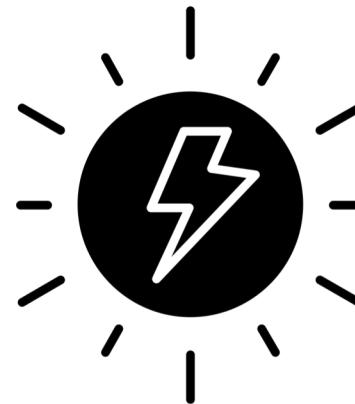


Types of Energy Sector Businesses

Oil & Gas (upstream, midstream, & downstream)

Electric (gen & distrib)

Water



Types of Insurance Analytic Solutions

Exploration

Research

Drilling

Refining

Distribution (pipeline)

Tankers

Storage

Water treatment

Employee Safety

Public safety

Land rights

Major Oil and Gas Supplier

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Opportunity:

Improve complete management of chemical usage and costs.

Data and Analytics:

Chemical samples, asset information, corrosion data, well production, events, and failures from over 48,000 assets.

Results:

Provide a unified, real-time view of well performance and production.

Opportunity:

Improve production performance and availability

Data and Analytics:

Changed data entry method from manual entry every 2 hours to an automated system every 2 minutes.

Imported process data, flow rates, pump rates etc.

Results:

Reduced refinery downtime and increased availability by 2% = \$35M a year

Opportunity:

Reduce OPEX and CAPEX through condition monitoring (CM) of substation assets.

Data and Analytics:

Real-time data through interfaces with Hydran, Transfix, MTAC, weather stations, alarm pods, SF6, etc., totalling over 85,000 data feeds/points.

Results:

Amulet saves an estimated GBP £20 million annually by reducing transmission failures.

Opportunity:

Improve reliability of the electric grid and the utilization of energy to meet state renewables goals.

Data and Analytics:

Real-time visualization and analysis of 25,000 miles of power line.

Results:

Enabled implementation of 4,000 pricing nodes (up from 5) to facilitate cost-effective local market pricing.

50% improvement in renewable forecast accuracy.

Opportunity:

Determine the most cost-effective replacement strategy for aging assets.

Data and Analytics:

Geospatial visualization and analysis of 4.5M (\$20B) assets across 30 different OT and IT data sources.

Results:

\$1.5M savings/year in fewer truck rolls.

80% of time spent analysing and 20% collecting data
(used to be reverse).

Opportunity:

Precise placement of wind turbines affects performance and useful life and energy costs.

Data and Analytics:

10x increase in breadth (178 parameters) and history (18-24 petabytes) of weather data.

Supercomputing-based analytics from IBM enables 10 sq meter grids vs 27 sq km grids previously modeled.

Results:

Reduced wind forecast modelling by 97% (3 weeks to 15 minutes) to pinpoint optimal placement of each turbine.

Opportunity:

Reduce refinery issues and unplanned maintenance.

Data and Analytics:

Vibration monitoring of the motors, reduction mechanisms, and pumps.

Results:

Reduced refinery downtime and saves 960 hours per year in manual monitoring per refinery.

Opportunity:

Improved efficiency in operations with existing gas turbine equipment.

Data and Analytics:

GE Power FlexEfficiency Analysis of 100,000+ million hours of operating data from 100 physical and 300 virtual sensors on each upgraded gas turbine.

Results:

Improved performance – more output (5-10%) better efficiency (1-2%) and lower emissions.

Powering additional 10,000 households per site; annual \$900,000 fuel cost savings.

Center Point Energy



Opportunity:

Improve energy delivery reliability and reduce costs

Data and Analytics:

Grow from collecting meter data 80,000 times to 273M times/day

Results:

Can determine exact location of power issues—precisely where they occurred and respond to it.

Greater control over energy consumption for customers.

Opportunity:

Provide reliable forecasts for demand, movement, and supply of clean water.

Data and Analytics:

Imports weather data every 15 minutes.

Amulet Predictive Analytics creates ‘what if’ scenarios in 30 minutes, replacing 2-3 weeks of analysis.

Results:

Actual versus predictive forecasts up to 2 years into the future.

Lesson 2.6

Telecommunications Examples



Types of Telcom Businesses

Mobile operators

Cable companies

Satellite companies

Separate device, infrastructure, and retail companies

Conglomerates of the above



Types of Telcom Analytic Solutions

Capacity

Utilization and demand

Pricing

Network optimization

Supplier management

Regulatory

Customer service

Customer fraud

Opportunity:

To identify “churn” prospects and take steps to prevent it.

Data and Analytics:

Analyze 500 discrete data elements including support call patterns, late or delinquent payments, and other ongoing vital signs via IBM predictive analytics solutions to identify at-risk customers.

Results:

47% reduction in customer churn, protecting \$15 million in revenue.

Predictive analytics has spread organically to other parts of the company including collections.

Opportunity:

Looking to utilize data & analytics for building customer trust, improve loyalty, boosts margins, and decrease churn.

Data and Analytics:

Built predictive models with SAP InfiniteInsight. Clustering techniques & social media analytics helped gain insights of customer behavior.

Results:

8x Increase in uptake of customer retention offers, from 0.5% to about 4%, and at a fraction of the cost.

Opportunity:

Improve performance of promotion offerings.

Data and Analytics:

New service delivery platform integrating customer and retailer data with real time promotional analytics and incentive payments.

Results:

600% increase in promotional sales.

95% reduction in time and cost of developing new promotions (10 months to less than a week).



Opportunity:

Customize offers more quickly and accurately for more than 6 million subscribers.

Data and Analytics:

Deployed a solution for predictive analytics, including segmentation, classification, regression, and data aggregation.

Results:

Witnessed 80% reduction in model creation time and 42X greater throughput for central analysts (from 40 to 1680 predictive models annually).

A photograph showing three students in a hallway. In the foreground, two girls are sitting on a bench, looking at a yellow spiral-bound notebook and smiling. One girl has dark hair and is wearing a blue zip-up hoodie. The other girl has glasses and a bun hairstyle, wearing a black jacket over an orange shirt. In the background, a boy in an orange t-shirt is sitting on a chair, looking at a laptop. The hallway has white walls and doors.

Lesson 2.7

Government and the Public Sector Examples

Types of Government and the Public Sector Businesses

Defense

Education

Public services

Public safety and legal

Welfare

Housing

Commerce, Trade, and Economy

Transportation



Types of Government and the Public Sector Analytic Solutions

Improving services and citizen engagement

Reducing fraud and ensuring compliance

Improving safety

Improving intelligence

Reducing expenses

Collecting revenues

Opportunity:

Dissuade disaffected individuals from being radicalized by ISIS online.

Data and Analytics:

The Redirect method from Google's tech incubator, Jigsaw, and its partners places special ads alongside results for 1,700 keywords and phrases it has determined attracted people to ISIS commonly search for.

Results:

Over 300,000 people were drawn to the anti-ISIS Youtube channels, and a half million minutes of the anti-ISIS videos have been watched.

Opportunity:

Tracking grease dumpers in NYC that account for 60% of backups citywide in 7,400 miles of sewer lines

Data and Analytics:

“Dark data” on local restaurants used to compare restaurants that did not have a grease carter with geo-spatial data on sewers.

Results:

95% success rate in tracking down dumpers.

Eliminated 30 million pounds of debris from sewers providing 2 million gallons of extra sewer capacity.

Helsinki Bus System



Opportunity:

Improve public transportation system to stay competitive with private bus operators in Helsinki, Finland

Data and Analytics:

Sensors generate 4 million data records each day, including speed, braking, acceleration, speed, idling, engine temperature, and fuel consumption on routes carrying 60M passengers per year.

Results:

Reduced fuel consumption by 5%; increased rider satisfaction 7%; reduced city's carbon footprint.

City of Santa Clara



Opportunity:

Optimize cities' investments in transportation infrastructure by improving traffic flow.

Data and Analytics:

Conversion of 107 traffic intersection video feeds and mapping data into actionable traffic intelligence and integrated traffic signals.

Results:

805,000 hours of reduced travel time per year due to reduced congestion (E.g. 18,000 fewer vehicle stops per day at 17 expressway intersections).

1 million gallons of fuel savings (\$3,000,000) per year.

Total emissions reduction of over 100 tons per year.

Opportunity:

Estimate crowd sizes for crowd control and safety.

Data and Analytics:

The volume of mobile calls, messages, and Internet connections opened, closed, and maintained within a grid of 10,000 cells of 235 sq meters each.

Analyzed the size of activity spikes versus baseline activity using a simple least-squares regression.

Results:

Calculate crowd size +/- 5%, at any moment

Ability to facilitate evacuations

New York City Fire Department



Opportunity:

Improve citizen safety and save city resources.

Data and Analytics:

Algorithm analyzes 2400 factors from 330,000 commercial and public buildings.

Results:

70% success in identifying fire hazards in buildings.

Bolzano, Italy



Opportunity:

Save on required community services and infrastructure for an aging population.

Data and Analytics:

A “smart city” network of home sensors to monitor temperature, carbon monoxide levels, water, and energy usage.

Results:

Lower assistance and care costs by 30%.

Enable more retirees to remain in their homes.

Reduce the need to build assisted living facilities.

Opportunity:

Increase Los Angeles police presence where it's most likely needed.

Data and Analytics:

Applied models for predicting earthquake aftershocks to historical crime data and other factors

Results:

33% reduction in burglaries and 21% reduction in violent crimes in test region of Los Angeles, compared to a slight increase in the rest of the city.

Pinellas County



Opportunity:

More efficient spending for at-risk kids.

Data and Analytics:

Integrated child-relevant datasets from different systems such as schools, child welfare, juvenile justice, and impact data.

Results:

Innovate policies and optimize budgets.

Predict where and model likely outcomes when adding resources to a particular program.

Swedish Police



Opportunity:

Increase the speed of Swedish police investigations.

Data and Analytics:

Analysed data from over 500,000 interrogations, evidence, and background info.

Results:

Helped locate a serial killer in the city of Malmö by calculating the time and location of the next shooting.

6.7M krone reallocated from administration to law enforcement.



Opportunity:

Determine which restaurants are prone to serving up foodborne illnesses.

Data and Analytics:

Researchers analyzed 3.8M tweets from 94,000 users tweeting about or while at 23,000 NYC area restaurants.

Results:

Over four months the system spotted 480 reports of possible food poisoning, which correlated with poor health department scores for these restaurants.

US Department of Human Services

Opportunity:

Detect fraudulent welfare payments with a big data platform.

Data and Analytics:

Automated data-sharing protocol and maps to detect anomalies.

Results:

650+ reviews since 2015-16 have resulted in \$25 Million+ savings.

It's also being used in large-scale statistical risk modelling in the anti-money laundering and counter-terrorism financing space.

Amsterdam Science Park



Opportunity:

Save the rhinos!

Data and Analytics:

Tag and track the animals (e.g., zebra, wildebeest, antelope) as they respond to the presence of human intruders anywhere in the 135 sq. mile African reserve.

Monitor and collect information related to the animals' location, movement, direction, and average speed of travel – along with other data.

Results:

15% decline in poaching from 2014-2016, following a 9000% increase from 2007-2014.

Beijing Subway



Opportunity:

Improve rail transit passenger flow and improve operation service.

Data and Analytics:

100 million travel records/month.

Machine learning models.

Results:

Achieved 98% accuracy to predict passenger flow volume.



Lesson 2.8

Healthcare Examples



Types of Healthcare Businesses

Hospitals

Biotech

Medical practices

Rehab centers

Senior living care

Laboratory services

Pharmaceutical and medical device companies

Types Healthcare Analytic Solutions

Developing new or expanded offerings

Developing, testing, selling new drugs or medical devices

Improving care

Optimizing resources

Predicting demand

Memorial Healthcare System



Opportunity:

Needed transparent vendor verification process to prevent fraud.

Data and Analytics:

Cross-referenced information among 800 databases for greater visibility into vendor activities.

Results:

\$2 million ROI over 10 years.

Reduced vendor invoice cycles from one month to 18 days on average, thus around 40% time reduction.

Pharmaceutical Company

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Opportunity:

Pharma companies need to monitor whether sales reps are promoting their drugs for “off-label” usage.

Data and Analytics:

Multiple complex data sources such as doctors, sales reps, prescriptions, sales rep expenses, and training attendance and generate risk ratings.

Results:

Identify and understand which sales reps or doctors are most at risk in participating in this behaviour.

Target appropriate outreach to these reps based on behavioural and data results.

Early Sense



Opportunity:

Improve hospital patient monitoring.

Data and Analytics:

A pressure plate piezoelectric sensor beneath the patient continually monitors respiration, pulse, and movement.

Results:

9% reduction in length of stay; 47% fewer ICU days; 64% fewer pressure ulcers;
43% fewer patient falls

ROI of up to \$2 million per year (for a 300 bed hospital)

University of Washington Jaundice Screening App

Opportunity:

Screen for jaundice in babies without a hospital visit.

Data and Analytics:

Smartphone application called BiliCam that checks for jaundice (excessive bilirubin) in newborns by taking a picture of the baby and a color calibration card.

Results:

Delivers results to parents and pediatricians within minutes.

Limited trial outperformed current medical apparatus costing several-thousand-dollars.

Opportunity:

Discriminate between two commonly misdiagnosed diseases.

Data and Analytics:

Echocardiograms consisting of 10,000 attributes from 90 metrics in six different locations of the heart.

Results:

Ability to discern cardiomyopathy from pericarditis.

Reduced misdiagnoses from 27% to 10%.

Opportunity:

Early identification of disease outbreaks.

Data and Analytics:

Automatically sifts through millions of posts on dozens of social media sites, local news reports, medical workers' social networks, and government websites to track instances of disease.

Results:

Identified a cluster of “mystery hemorrhagic fever” in Guinea over a week before the Ministry of Health of Guinea notified the World Health Organization (WHO), that a day later confirmed the Ebola outbreak.

Opportunity:

Improve monitoring for ovulation cycles.

Data and Analytics:

4M data points from over 70,000 women via wearable “quantified self” devices along with self-reported data on body medical history, weight, menstrual cycles, and sexual intercourse specifics via a mobile app.

Results:

Users report pregnancies in about 60 days (2-3x faster than national average).

Opportunity:

Identify and intervene with patients who are less likely to take their prescriptions correctly.

Data and Analytics:

Analyzes 400 variables including prescription history, economic makeup of the patient's neighborhood.

Results:

90% compliance prediction accuracy.

Beeping bottle caps increased compliance 2%; timers given forgetful patients improved their compliance 16%.



Lesson 2.9

Sports and Entertainment Examples



Types of Healthcare Businesses

Event venues

Teams and performance artists

Museums

Theatres

Casinos

Types Healthcare Analytic Solutions

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Connecting with fans and customers

Improving demand

Improving or customizing customer experience

Vendor management

Crowd control

Athlete performance

Concessions

Opportunity:

Identify pop-star's known stalkers attending her events

Data and Analytics:

Kiosks deployed at concert venues developed by Oak View Group that play videos of the recording artist, matching with a database of over 100 known stalkers.

Results:

In China, “Xue Liang” (or “Sharp Eyes”) monitoring system, has identified at least one stalker leading to his arrest.

Opportunity:

Improve theatre profitability, generate incremental revenue from movie goers, identify need for additional premium screens.

Data and Analytics:

Blend and analyze movie goer data, using trade area analysis to target marketing by geography, forecast demand for upcoming movies, and identify need for additional theatres.

Results:

Personalized concession marketing helping increase amount and incidence of purchase.

Reliable forecast of opening rate and revenue decay per movie to determine the lifecycle of movies and when to replace them.

Point Defiance Zoo and Aquarium



Opportunity:

Improve revenue at this small Washington zoo.

Data and Analytics:

Monitors, integrates, and analyzes data collected at exhibits and event sites, social channels, and ticket sales and historical data from 600,000 annual visitors.

Results:

Increased online ticket sales by 700%.

Doubled annual member renewals from 3% to 6%.

Opportunity:

Improve ability to measure baseball player performance.

Data and Analytics:

Collects 2.5M data points per game including batter stances and swing speed and plane; pitch speed, curve, and location; fielder reaction time and trajectory; base runner reaction and speed, etc.

Results:

Determining which fielders get the best jump on a ball and field it optimally, who are the smartest runners, how to pitch to certain batters (and vice-versa), etc.

Florida Panthers



Opportunity:

Increase fan base, sell more tickets, and drive sponsorship revenue.

Data and Analytics:

Panthers combined all fan data coming from various sources such as CRM, social media, ticketing etc. to get a complete view of their fans.

Results:

12.5x ROI from their data and analytics platform.

NFL Scheduling



Opportunity:

Schedule NFL games to maximize profit.

Data and Analytics:

20,000 variables and 50,000 constraints were analyzed using 'FICO Xpress Optimization' suite to come up with optimized schedule while evaluating 7000 game options.

Results:

NFL's revenue and sponsorship grew substantially after using the solution in the first five years.

Saves on time as new schedule can be produced in 24 hours, a task which could take months earlier.

Opportunity:

Improve marketing lift across multiple channels and countries to those betting on European country lottery outcomes.

Data and Analytics:

Analyzing billions of website transactions and over 500 attributes per customer.

Results:

Reduced time to develop predictive models from days to hours (30 models per day) without statisticians.

Improved marketing conversion rates by 400%.

Lesson 2.10

Other Examples



Other Businesses



Transportation

Agriculture

Education

Conservation

Professional Services

Opportunity:

Improving driver safety and efficiency

Data and Analytics:

Telematic sensors in 46,000+ vehicles capturing speed, direction, braking, drive train, RPM, oil pressure, shifting, idling time, seatbelt use, and 200 other data points including geographic and map data.

Results:

Saves 8.4M gallons of gasoline per year and reduced maintenance and accidents by cutting 85M miles off daily routes and a 25% reduction in reversing trucks for a \$50M annual savings.

Opportunity:

Understand activities within a building without having to go inside.

Data and Analytics:

Maps of the interior of a building using the unique magnetic “fingerprint” of the structure.

Results:

Emergency personnel can use a Google Map overlay to navigate a building.

Competitors can see changes to layouts and foot traffic.

Opportunity:

Understand and improve animal populations.

Data and Analytics:

Tagging smaller animals 0.15 gram VHF radio transmitters too weak for satellites to pickup.

A network of receivers placed on United Airline's 5300 daily flights.

Results:

Lower cost tags and receivers mean a greater number and variety of smaller animals can be tracked continuously.

Reduce expense of dedicated flights by private planes or catch-and-release techniques.

Tom Farms



Opportunity:

Improved farming productivity, growth, and margins.

Data and Analytics:

Drones equipped with infrared cameras survey for flood, irrigation, and crop stress. Combines take continuous readings, analyzing data in real time data on moisture, yields, etc. via iPads.

Results:

Ability to farm 20,000 acres, up from 700 acres in the 1970s, with only 25 employees.

ROI growth from 14% to 21%, despite 8x increase in cost of sensor-loaded combines.

Steady Serv



Opportunity:

Improved inventory and tracking of beers.

Data and Analytics:

SteadyServ's iKeg system tracks keg contents and levels via sensors, NFC/RFID tags, cloud, analytics, and a mobile app.

Results:

Reduces amount of wasted beer from 15% to virtually zero.

Real-time insights to all supply chain stake holders; brewers, distributors, retailers and brand managers.

Opportunity:

Crowdsourced and combined algorithms for stock trading.

Data and Analytics:

Encrypted trade data is provided to a vast community of data scientists and programmers.

Algorithms are combined via stacking and ensemble machine learning techniques.

Results:

Has received \$1.5M in funding.

7,500 data scientists have built 500,000 machine learning models that drive 34 billion predictions for the fund.

Opportunity:

Reduce the number of “hook-ups” between close cousins in Iceland.

Data and Analytics:

The database traces family lineage of 720,000 current and deceased Icelandic natives.

Results:

4.6/5.0 app store rating

Actual tagline: “Bump the app before you bump in bed.”



Opportunity:

Improve graduation rates by optimizing available resources.

Data and Analytics:

Analyzed 2.5 million grade records over 10 years to create a list of factors that hurt chances for graduation.

Results:

System prompted 51,000 in-person meetings between students and advisers and graduation rates are up 6% points since 2013.

Opportunity:

Predict student/applicant success rate & suitability for courses.

Data and Analytics:

Classroom, job, & achievement data to predict if students would face problems.

Results:

The accuracy increased from 82% to 96% in identifying “high-yield” prospects, while also saving cost of hiring external analysts.

Opportunity:

Streamline the process of detecting and reporting fraudulent behavior.

Data and Analytics:

Vast amounts of transactional data (millions of rows) and ‘risky transaction’ detection scenarios.

Run analysis (time-series, aggregations, counts) and write stories via Narrative Science that identify which buyers and risk flags are the most important.

Results:

Automated on-demand reports that accurately identify fraudulent behavior in T&E expense transactions.

Reduced the time spent creating one report from one week to a few seconds.

Opportunity:

Solve complex audit challenges by utilizing a new generation of analytic tools.

Data and Analytics:

Lavastorm Analytics Platform's discovery-based audit capabilities provided comprehensive insights where high volumes of transactions were involved. Capability to reproduce complex business logic through the visual creation of business rules.

Results:

Delivered results up to 90% faster than traditional tools.

Offers a competitive advantage within the auditing and consulting market.

40% greater accuracy in audits.