

# How Businesses Can Use **Data Science and AI** to Gain a Competitive Edge





## Intro

Businesses who don't effectively use their data will be losing \$1.2 trillion to their competitors every year by 2020. In order to stay competitive, companies need to find a way to leverage data into actionable strategies.

Artificial Intelligence is the key to maximizing data utilization. Read on for an in-depth analysis of how AI technology is being used by businesses to improve workflow, minimize waste, increase customer satisfaction, and plan for the future.

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# Executive Summary

Interest in using artificial intelligence to enhance corporate decision making has been gaining momentum over the last several years, but it hasn't been fully embraced. Only one in three executives describe their organization as highly data-driven. [62% of senior business leaders](#) turn to personal experience or advice from peers instead of data when planning, and over half have outright ignored information they didn't understand.

**These numbers highlight one glaring truth:  
the business world has  
a serious data problem.**

The problem doesn't lie with data collection. Modern companies have access to a breadth of information that would have stunned executives twenty years ago. [80% of the world's existing data](#) is stored by enterprises, and they aren't just tracking transaction data anymore. Now there are analytics from social media sites like Facebook and Pinterest, metrics from in-store tracking methods, loyalty card activity, metadata from website visits, and third-party customer insight assessments. Those are only the methods that cover customer interactions. Add operational data like that generated by internal processes and companies are creating information at an incredible rate.



Experts are predicting a 4300% increase in annual data production by 2020.

Finding reliable data storage isn't the issue, either. The rise of low-cost cloud storage options has made it possible to squirrel away massive amounts of information without an equally massive investment. A new startup no longer needs to build its own data center full of servers for an application which might see a 20% utilization rate. Companies can purchase the storage they need and save data without worrying about building the physical space to store it.

The real problem with data is the difficulty in translating a flood of information into practical courses of action. Data needs to be analyzed, processed into understandable results, and distributed to those who can best act on it before it even begins to earn its keep. That's a challenge when the sheer volume of data involved makes it impractical for humans to process using traditional accounting and tracking software.

**In fact, the average company uses only 1% of their stored data to influence business decisions.**

Advances in Artificial Intelligence offer a solution to this dilemma. Turning to AI-enabled software for data analysis generates active guidance for decision making, not just passive evaluations of current strategy. Data



can suggest new avenues of enterprise and solve problems that prevent human employees from working efficiently. A company that doesn't take advantage of that risks being outcompeted by peers who do.

Falling behind is a legitimate risk. [The last surge of interest in artificial intelligence back in the 1970s](#) collapsed because of a lack of available data and computing power to follow through on expectations. Cheaper and faster technology has already removed that limitation. Gartner estimates that [75% of companies](#) are either investing now or planning to invest in analytics and big data solutions within two years.

The investment is already paying off for many early adopters. The [Big Data Executive Survey](#) found that 48.4% of respondents from companies who have launched AI enabled data initiatives have seen a measurable return on their investment. 80% of respondents were pleased with success of their big data initiatives so far, regardless of profits.

The average Fortune 1000 company can boost net income by [more than \\$65 million](#) with a mere 10% increase in data accessibility. The growth comes from employing AI-powered processes that cost less to maintain and grant a heightened ability to take advantage of new markets and opportunities.

An increase in revenue this size has to come from somewhere. In this case, it's companies that haven't adopted AI decision-making yet.

Forrester predicts that companies who increase their data utilization “will steal \$1.2 trillion per annum from their less informed peers by 2020.”

Qubole CEO [Ashish Thusoo](#) describes the situation bluntly: “Using data is not really an option, it’s really a requirement in this day and age. Data is starting to move from experimental to the situation where if you’re not adopting you’re losing some competitive advantage.”

In short, data is fast becoming a currency and Artificial Intelligence is the tool needed to understand it.

This report will cover the scope of the data issue, then move on to discuss how AI works and the ways in which it can be applied to give businesses a competitive edge.



# The Hidden Cost of Unused Data

Most companies have more data than they know what to do with. Unless a company has a dedicated data science team, it can be hard to know what information could be useful and what's just background noise. Some incredibly helpful types of website analytics look like digital static to the untrained eye. Companies respond to this pressure by saving whatever seems relevant to future use, even when they aren't sure how far in the future they'll use it.

**Here's the catch: saving data is more expensive than it seems.**

Data doesn't self-populate in a vacuum. If it isn't produced as a by-product of normal operations, someone had to design a way to capture it. Some data comes from third-party industry reports which can cost upwards of \$1000 each.



**Smarter use of data will help marketers respond faster – and better – to business challenges.**



Noah Elkin, Street Fight

Security is another hidden cost to data maintenance. Regardless of its origin, data has to be secured against malicious intrusion by those hunting for corporate secrets or maybe just customer details (especially personally identifying information). Healthcare related businesses have a heavy regulatory burden when it comes to protecting their client data.



# DATA by the Numbers

In 2016 companies spent **\$37 billion**  
On Cloud Infrastructure

**44 Zettabytes** of Data will be created by 2020.  
One ZB is equivalent to 1 trillion terabytes

**2.5**  
BILLION GB

of Data are created every day

**80%**

of the world's Data is  
unstructured (blogs, emails, etc)

**70%**

of Data is stale after 90 days

0.5%  
of raw Data created is analyzed and used

**20%**

of Data is publicly available on the internet.  
The rest is privately held  
by businesses or governments.

Source: conceptainc.com



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**It's all about interaction with the consumer. AI becomes a great way to deliver the best possible customer journey.**

Ben Taylor, Rainbird CEO

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While cloud storage may be cheaper than it once was, it isn't free. According to the IDC, corporate spending on cloud infrastructure was [over \\$37 billion in 2016](#). The costs of cloud storage are deceptive since they're typically paid as regular operating expenses, like a utility bill, rather than a large up-front investment of capital.

As if the expense of gathering, protecting, and storing data weren't enough, at least some of a company's data is likely to be unusable. It's only when they find a data science provider that they realize how much of their stored data is redundant, incomplete, or outdated. This isn't necessarily a result of employee error. Data which is collected by separate platforms might be duplicated in the database, for example.

The bottom line is that companies are paying to maintain a resource they aren't fully exploiting. Full databases are useless without a means of pulling meaningful insights from the numbers. To stay competitive, companies need to find a way to leverage their data into actionable information.



# Applications of Artificial Intelligence

Artificial Intelligence has come a long way. Those familiar with older forms of AI might remember expert systems where computers were programmed to use “if-then” statements to solve problems. These early AI models could solve mathematically complex problems but needed a lot of hand-holding from a programmer to convert data to a useful format. They were only able to do what they were programmed to, and unexpected hurdles brought their calculations to a halt.

Machine learning, where most AI research is now focused, relies more on creating flexible algorithms that can adapt to new information. Computers running these programs don’t need to be constantly updated with new parameters; they can learn from their own mistakes and then apply that experience to future calculations. When applied to business data the insights generated by AI can show specific ways for a company to improve and grow.

## It's being hailed as a landmark change in industry.

Eric Schmidt, Google’s executive chairman, thinks machine learning is the [“future of wealth creation”](#). He went on to predict that the combination of data and machine learning “will be the basis and fundamentals of every successful huge IPO win in 5 years.”

Artificial Intelligence has incredible potential for enhancing business strategies. Using AI techniques, companies can increase efficiency, improve customer retention and satisfaction, manage labor and repair costs, and reveal opportunities for growth and improvement.

For a better understanding of Artificial Intelligence’s flexibility, take a look at these real-world applications of AI. Each includes specific case studies demonstrating how AI is helping grow businesses today.



# AI at Work

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**Artificial Intelligence** is changing the way business is done.  
Here are a few ways companies can use it to gain a competitive edge.



## FORECASTING

Predictive Analysis assesses the market in context to provide the best possible predictions.



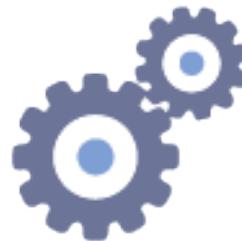
## GROWTH HACKING

AI improves the market segmenting and analysis process to fuel faster growth.



## CUSTOMER SERVICE

Smarter Chatbots provide personalized 24 Hour service with no waiting.



## PREVENTATIVE MAINTENANCE

Predicting equipment failures before they happen minimizes downtime.



## FRAUD PROTECTION

Behavior modelling spots fraudulent transactions without a lengthy human review process.

Source: conceptainc.com



# Accurate Forecasting

It's impossible to see the future, but AI powered predictive analysis comes pretty close. This is one of the key strengths of machine learning: the ability to compare wildly different streams of information and use them to form a picture of future events reliable enough to use in business. [Nearly a third of C-level executives](#) name predictive analytics as their top priority for machine learning optimization.

In the past businesses have built their predictions on statistics drawn from historical data. For example, an independent landscaper might look back at the average number of service calls they received each month and plan the upcoming year around that.

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**Information is the oil of the 21st century, and analytics is the combustion engine.**

Peter Sondergaard, Gartner Research

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The problem with this model is that it only takes into account what has happened, not what will happen. It assumes outside factors are linear and can be easily quantified. Living markets are much more complex. Housing trends, economic fluctuations, shifting population patterns, climate change, and even celebrity endorsements have a measurable effect on what people plan to do with their lawns. By relying on historical analysis



to inform future strategy, our landscaper might not be prepared for a busy summer and wind up turning away work.

Samantha Searle, a research analyst for Gartner, has been saying since 2014 that historical metrics are outdated. “To prevail in challenging market conditions, businesses need predictive metrics...rather than just historical metrics,” she wrote in a Gartner report. “Predictive risk metrics are particularly important for mitigating and even preventing the impact of disruptive events on profitability.”

Predictive analysis takes a variety of factors which might affect the company’s operations and applies an algorithm to weigh them against each other. New information or input from the user causes the software to adjust its calculations without needing additional programming. It’s one of the most powerful applications of Artificial Intelligence, and every industry can benefit from its use.

Prioritizing predictive marketing techniques has a measurable benefit on revenue. [A study conducted by Forrester Consulting](#) studied a cohort of B2B companies, half of whom relied on predictive analytics to some extent and half who did not.

**The predictive marketers were three times more likely to have higher growth rates than their industry-average competitors.**

Laura Ramos, one of the Forrester analysts who created the report, said, “Predictive analytics pays off. If you use it right, you can outdistance the competition.”



# Case Study



# Case Study: Birmingham Zoo

Birmingham Zoo is one of Alabama's most popular tourist attractions with more than half a million visitors a year. When Dr. William Foster became Executive Director they were using historical data to estimate how many guests would visit on any given day.

The numbers were often off by a significant margin. This led to situations where there were either too many employees on duty for zoo traffic or unexpected crowds overwhelmed the staff. Dr. Foster wanted an innovative way to operate more efficiently. His data science team took the historical visitor traffic data and added in variables like projected temperatures, rainfall patterns, holidays, and local school calendars to build a more reliable predictive algorithm. Zoo leadership can access the results through an intuitive digital dashboard.

The AI-based model allows the zoo to predict when unrelated events, like an unusually warm summer and a school holiday, might overlap to cause a surge in visitors.



It also suggests possible periods of low attendance. Zoos can take advantage of these periods to conduct maintenance without disturbing visitors or target them with tailored marketing campaigns.

Armed with the new analytics, Birmingham Zoo now has a better understanding of attendance and the ability to more effectively plan events. That means less money wasted through overstaffing and poorly-timed construction.

**“It allows the Zoo to identify future attendance patterns before they occur, and to make real-time adjustments to the daily operations in order to meet our longer-term goals,”**

    said Dr. Foster.



# Case Study



# Case Study: PhotoBarn

PhotoBarn is a custom memento company based out of Tennessee. Their business model revolves around a process in which customers upload photos which are then transferred by hand to a variety of mediums: blocks, boards, sheets of burlap, wooden ornaments, and more. Balancing the variety of products presented a serious challenge to the company. There was no intuitive way to predict which mediums would sell when. Unexpected spikes in demand caused supply chain problems, with suppliers running short of materials at key moments. Orders were backing up in the warehouse and products took far too long to reach customers.

In 2015, PhotoBarn marketing chief Ryan McClurkin decided to overhaul the entire process. He called on predictive analytics to create an algorithm that could anticipate demand far enough in advance to plan. PhotoBarn could now have materials available to fill orders before they were even made. The analytics were also useful for testing possible plans for expansion. “When you’re talking about corporate strategy, what types of new policies we’re going to put in place, and what kinds of new projects we’re going to pursue, predictive analytics can help you decide which ones will be impactful,” McClurkin explained.

The change paid off. **PhotoBarn experienced a massive increase in efficiency, moving five times more product without hiring additional employees.** Much of this is due to the improved planning which ironed out supply hurdles in the warehouse. Employees no longer have periods of forced inactivity due to supply shortages, removing the wasted labor expenses common before the reorganization.



# Defining Normal With Behavioral Analysis

While predictive analysis aims to predict the future, behavioral analysis-sometimes called behavior analytics - **focuses on what's happening right now**. Raw event data is analyzed to construct a digital picture of a person or system's "normal" behavior. That digital picture can be compared to itself, which is what a lot of cybersecurity software does, or it can be associated with data from other users to determine how people as a group are behaving.

Behavioral analysis has been around since well before machine learning began trending. It serves as the basis of cyber security software. However, even today many modern virus detection programs don't fully incorporate Artificial Intelligence into their programming. They restrict their analysis to a single category of data and rely on a set list of rules to determine what kind of activity falls within the limits of "normal".

That lack of flexibility causes these programs to throw out a lot of false positives, forcing network administrators to choose how sensitive they wanted their program to be. Too broad a normal range and technicians don't have time to check all the alerts, too narrow and they risk bypassing an actual issue. It's a balancing act that often ends in failure. Target Corporation (NYSE:TGT) suffered a huge security breach in 2014 because of this exact weakness. Their software saw a threat, but there were too many false positives obscuring the real attacker.

Using Artificial Intelligence to power behavioral analysis is a proven way to reduce false positives without increasing the risk of false negatives.



AI software is able to [correlate data](#) across several channels of incoming data to confirm or deny alerts before passing them along to the IT manager. Fewer false positives means the user has time to check every possible threat.

It's clear to see how this applies to information security, but what else can behavioral analysis do? Alexandru Balan, Chief Security Researcher at Bitdefender, says, "Machine learning and behavioral analysis is one of the biggest trends in detecting anything and everything these days." That means any company that relies on knowing how things usually work or finding abnormalities in patterns of activity can be improved through behavior analysis.

### **Some common applications are:**

- **Preventing online fraud**
- **Fueling recommendation engines for e-commerce**
- **Detecting insider threats to a network**

Virus detection and insider threat software are among the better-known applications of behavioral analysis, so these case studies will examine other practices.

**I really believe one of the things that will distinguish businesses into this next decade is this area of how they use information. Predictive analytics, I think it'll change culture, it'll change everything that you do. And I believe it'll differentiate the winners and the losers no matter what business you are in are in.**

**Ginni Rometty, IBM CEO**



# Case Study

The logo for delivery.com, featuring the company name in a large, white, cursive-style font against a dark blue background. The background is slightly blurred, showing faint text from the slide's content.

delivery.com



# Case Study: Delivery.com

Delivery.com is a online service that arranges deliveries from restaurants that don't normally offer that service. Customers supply their street address and are presented with a list of partner restaurants in their area complete with menus. Once their order clears, the system forwards it to the restaurant and dispatches a local subcontractor to deliver the food. Delivery.com pays the courier and restaurant up front from the customer's payment.

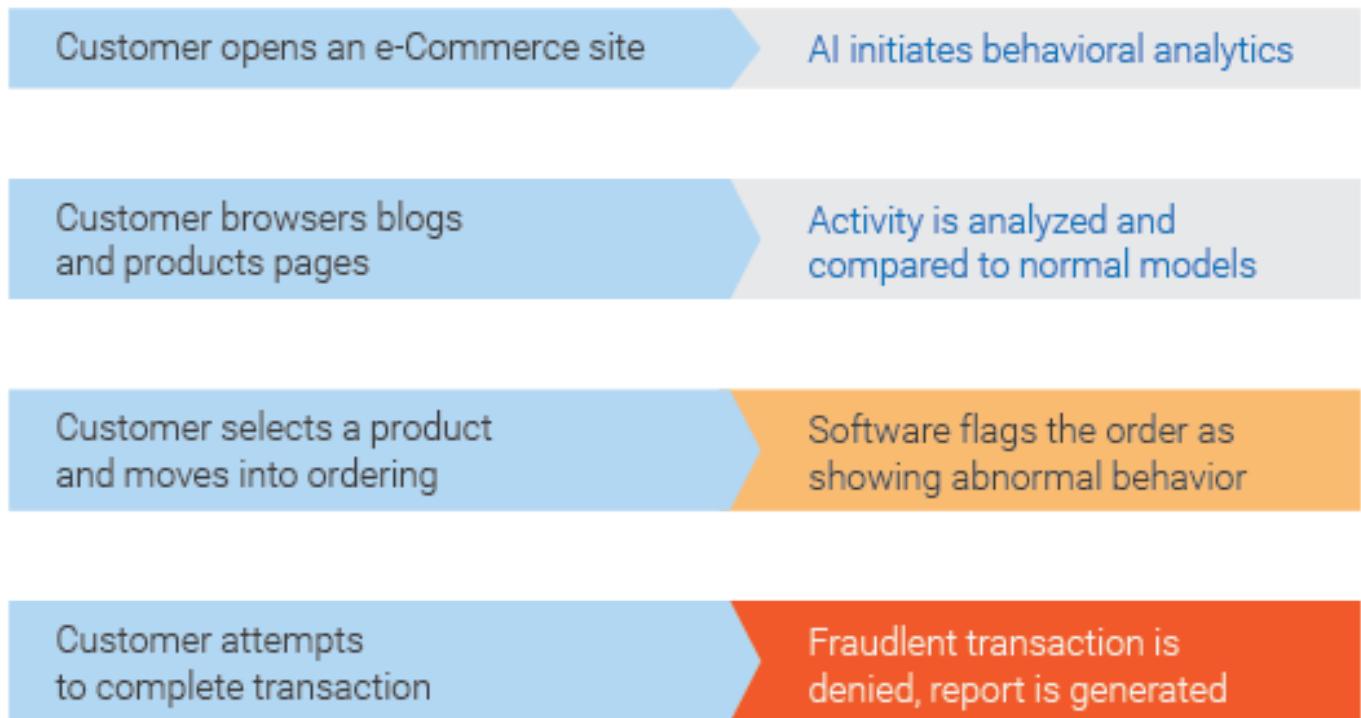
While this model makes attracting new partners easier, it does mean Delivery.com takes the **brunt of losses from fraud**. Despite this, the company started out using very basic fraud detection software. The reasoning behind this was that, in order to stay competitive, Delivery.com needs to get the product to their customers within the same time frame as more common delivery options like pizza. The more time spent validating the customer, the less time the partner restaurant and courier have to execute.

Delivery.com's security was not up to the task of screening orders. Like over 90% of online fraud detection platforms, it still used logic-based rules to forward suspicious activity to a human for clearance. This results in 10-26% of transactions needing to be manually reviewed for signs of fraud.



# Fighting Fraud With AI

How Behavioral Analysis can detect fraudulent orders online.



Source: conceptainc.com

Delivery.com has an eight-minute window to forward orders to their partner businesses if they want to guarantee delivery within an hour. Manually verifying a fraud alert can take as much as ten minutes. Prioritizing time over precision, human operators couldn't thoroughly inspect each flagged order. Subtly fraudulent orders passed through while some legitimate customers were denied for insignificant technical errors. On top of the risk factors, the noticeable lag in order confirmation while this process was carried out negatively impacted the customer experience.



“We had our customer service team actually stepping in and looking at flags and trying to review the transactions,” said [Colin Sims](#), COO for Delivery.com. “It completely devoured their time and they weren’t able to deal with regular customer issues.”

Dealing with fraud became a major operational expense. Delivery.com was a popular target for scammers, especially those using stolen credit card information. The cost of refunding fraudulent orders began eating into profits. Increasing processing times was not a feasible option, so Delivery.com had to think creatively.

**Delivery.com's behavioral analysis starts observing a customer as soon as they land on the homepage. Everything relating to their activity on the site is tracked. The software notices if a customer is ordering from a strange location, quickly clicks on the first restaurant in a search list, orders a huge amount of food without spending much time on the menu, or any of a number of small “tells”. It assigns a weighted value to each data point based on how far or close it lies to the definition of normal. When the customer moves from ordering to payment, the system compares their behavior to its models of “good customers” and “scammers”.**



## The solution was a complete overhaul of their fraud detection procedures to incorporate Artificial Intelligence.

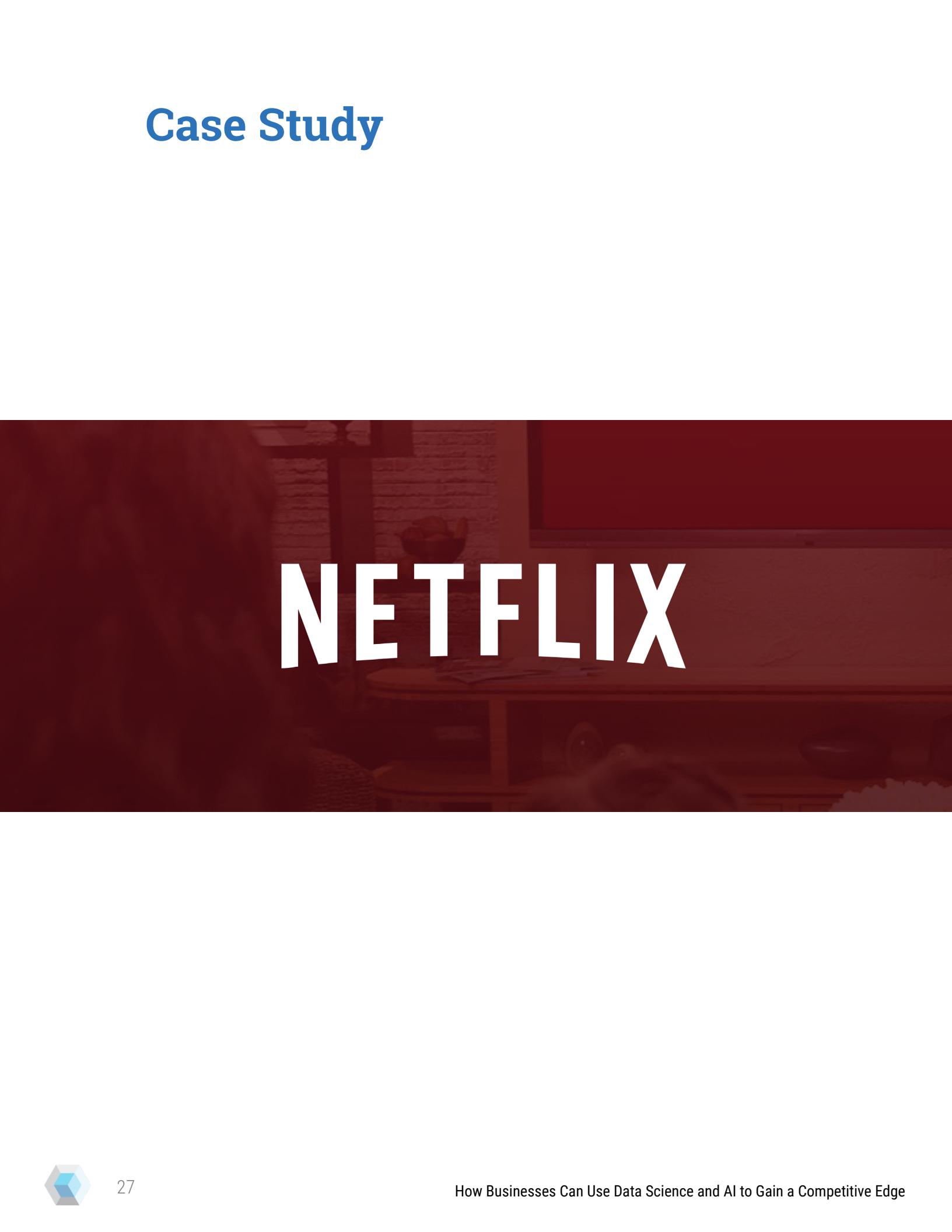
The new system began by analyzing the accumulated data from past transactions to form a model of how both legitimate customers and scammers behave. This picture is continually updated in order to keep pace with the evolving tactics of thieves. Essentially, every good customer and every fraudulent order trains the system a little more in what is and isn't "normal".

Rather than the five to ten minutes it might take for a human attendant to find and clear the order, the model reaches a decision about the trustworthiness of an order almost instantly. Delivery.com staff can access the evaluation of every order if they want to know why it was or wasn't approved.

Adopting behavioral analysis made Delivery.com's ordering process more efficient and led to a higher accuracy in fraud detection. With analytics clearing the forest of false positive, transaction approval rates rose to 99.5%. Chargebacks fell by 69%.

Moreover, the customer experience was significantly improved with fewer people being mistakenly labelled as fraud risks.

# Case Study



NETFLIX



# Case Study: Netflix

No discussion about how Artificial Intelligence helps business would be complete without Netflix (NASDAQ:NFLX). The company's success comes from its innovative use of Artificial Intelligence strategies, especially behavioral analysis, to suggest content its users might enjoy. [Chris Jaffe](#), VP of Innovation at Netflix, describes his driving goal: "If you're tired and it's the end of the day, you could read a book or a magazine, you could go on Facebook, watch linear TV, or watch Netflix. We want to make Netflix so engaging you keep choosing it."

There's a very small window for success. Netflix has [between 60-90 seconds](#) to catch a viewer's interest. Viewers give each double row of title cards as little as ten seconds before scrolling in search of something else. If that happens too often, the viewer might drop the service entirely. There are no contracts with Netflix; viewers can cancel their subscription within ten minutes penalty-free.

**To keep viewers engaged, Netflix employs a system of machine-learning enabled algorithms that focus on behavioral analytics.**

They weigh every piece of data the company has about viewer habits: what they watch all the way through, what they abandon after a few minutes, what their friends watch, and even what they hover over multiple times without choosing. This information is used to organize subscribers into "communities" based on the types of programming they favor. This allows Netflix to suggest similar shows as



well as things outside the genre which have been well-received by other members of the viewer's communities. Their recommendation system drives 80% of hours streamed annually.

Machine learning like Netflix's recommendation engine is even more accurate than suggestions from friends, according to their Director of Machine Learning [Tony Jebara](#).

**"[H]umans are notoriously bad at recommending content or items to their friends. We think aspirationally rather than realistically; we recommend a high-brow documentary that sounds intellectual rather than what our friends really would rather watch."**

Behavioral analysis, on the other hand, focuses entirely on the user's own inclinations.

Behavioral analytics still has more to teach the company. With competitors like Amazon Prime pushing for space in the international streaming content market, Netflix needs every advantage their data can provide. One of their most recent analytics-fueled revelations concerned users in smaller countries who were abnormally likely to be dissatisfied with their recommended programming. Netflix had separate content catalogs for each nation to simplify navigating copyright laws and distribution agreements. Data showed that customers in smaller countries were not being engaged because there wasn't a large enough local community of subscribers. **The United States has around 45 million Netflix subscribers**, providing a generous population for comparison, but nations like Grenada with barely 100,000 residents weren't as fortunate.



The recommendation engines didn't have the data necessary to properly suggest new shows.

Netflix solved this issue by unlocking the country restrictions on their recommendations. Managing the legal concerns required a large team of programmers, but with behavioral analysis exposing this flaw the company could see the opportunity for improvement. Now subscribers in small countries have access to the full power of Netflix's recommendation system. Carlos Gomez-Uribe, Vice President of Product Innovation, said in an interview, "If one member in this tiny island expresses an interest for anime, then we're able to map that person to the global anime community... Now we are able to find the best story for that person regardless of where that story comes from in the world."

The ability to use Artificial Intelligence strategies like behavioral analysis has helped the company maintain the competitive edge in the international market. Their fourth quarter earnings in 2016 were up 35% from 2015, and they expected 70% of the 5.2 million new subscribers to come from outside the United States.

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**You cannot improve what you cannot measure, and the way to make smart decisions is only through data science.**

Guarav Raghav, Yelp PM

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# Predictive Maintenance

Manufacturers experience as much as 800 hours of downtime due to unexpected equipment failures.

In a best-case scenario this downtime only affects a few employees, but it can cause a bottleneck effect that forces staff to perform low-value “busy work” tasks while waiting for repair. Manufacturers have gotten smart about backing up important systems; [66% rely on a regular back-up protocol](#) to maintain data from their most important equipment.

Making it easier to recover doesn’t prevent the loss of productivity, though, and repeated failures cause unnecessary wear on equipment. Ideally, the equipment would be maintained to a level where downtime would be short and predictable. Behavioral analytics and predictive analysis can be combined to monitor industrial processes beyond simple “wear tracking” or “danger alerts”. Analyzing data on the physical aspects of manufacturing provides a living assessment of condition. This allows executives to view real-time risk assessments and plan maintenance before a machine physically breaks down.



# Case Study



# Case Study: Thyssenkrupp Elevator

[ThyssenKrupp](#) (ETR:TKA) is one of the world's leading elevator manufacturers who also supplies maintenance, overseeing more than a million elevators worldwide. Elevators are key to the function of business in major cities. If one breaks down, every company in the building suffers a loss of productivity until the elevator is back online. CEO [Andreas Schierenbeck](#) was looking for a way to improve their maintenance procedures. "We wanted to offer predictive and even preemptive maintenance, so we can guarantee a higher uptime percentage on our elevators."

ThyssenKrupp chose [Microsoft Azure Machine Learning](#) to power their analytics. The custom algorithm sifts operational data from each elevator (shaft alignment, motor temperature, variations in speed, door operation, etc.) in order to predict the ideal time for maintenance. When problems are on the horizon, ThyssenKrupp can swap out parts before a breakdown affects other systems.

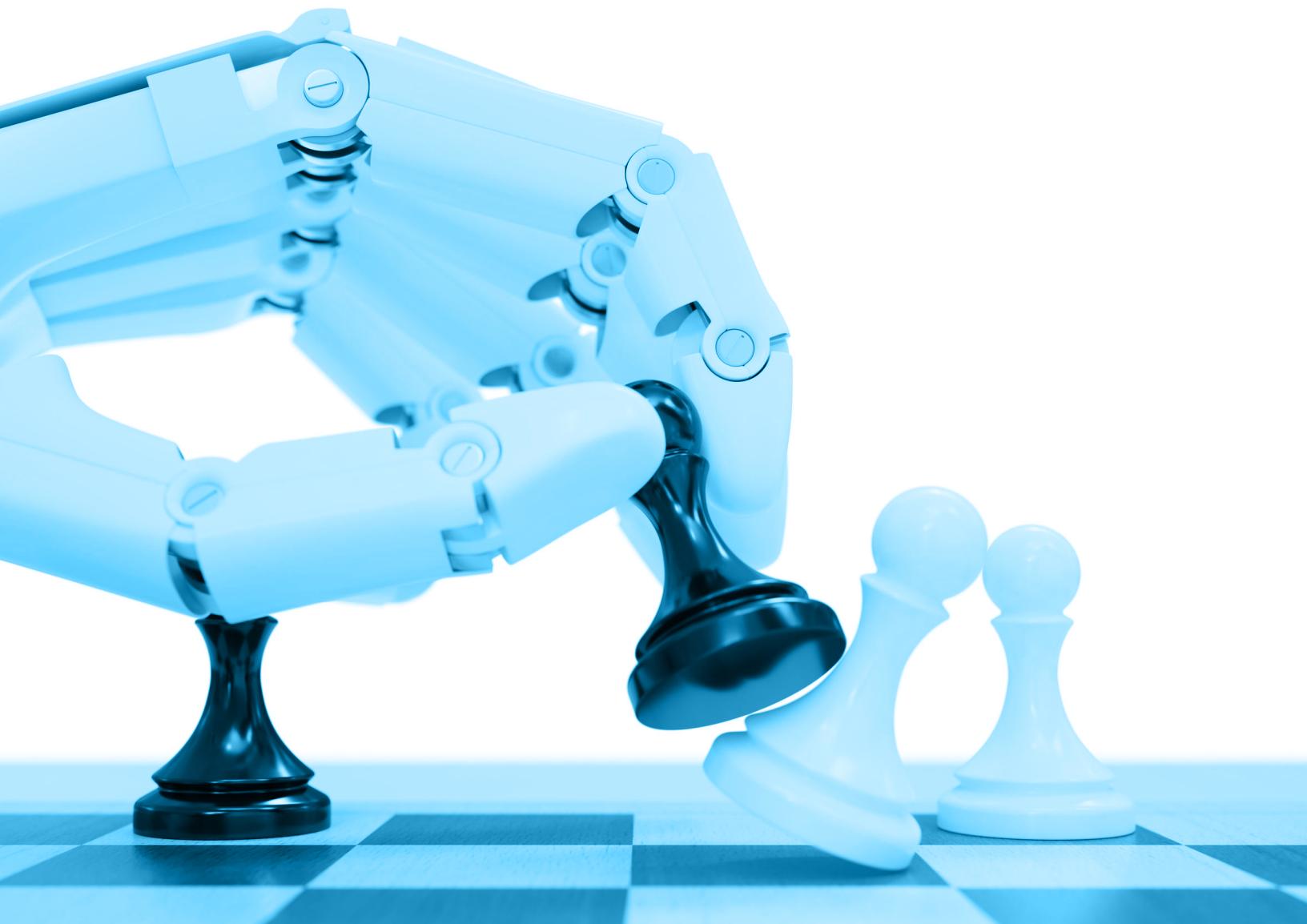
ThyssenKrupp's AI solution employs a sort of virtual troubleshooter. Instead of reporting a fault code by itself, it analyzes other data and supplies the most probable causes of the error code in context. Technicians then know what repair parts to bring. They can also rely on a set of constantly updated datasets for training purposes.

Elevator downtime has dropped since ThyssenKrupp began using the machine learning algorithms. Customers are also enjoying reduced emergency repair and service fees, which improves customer satisfaction.

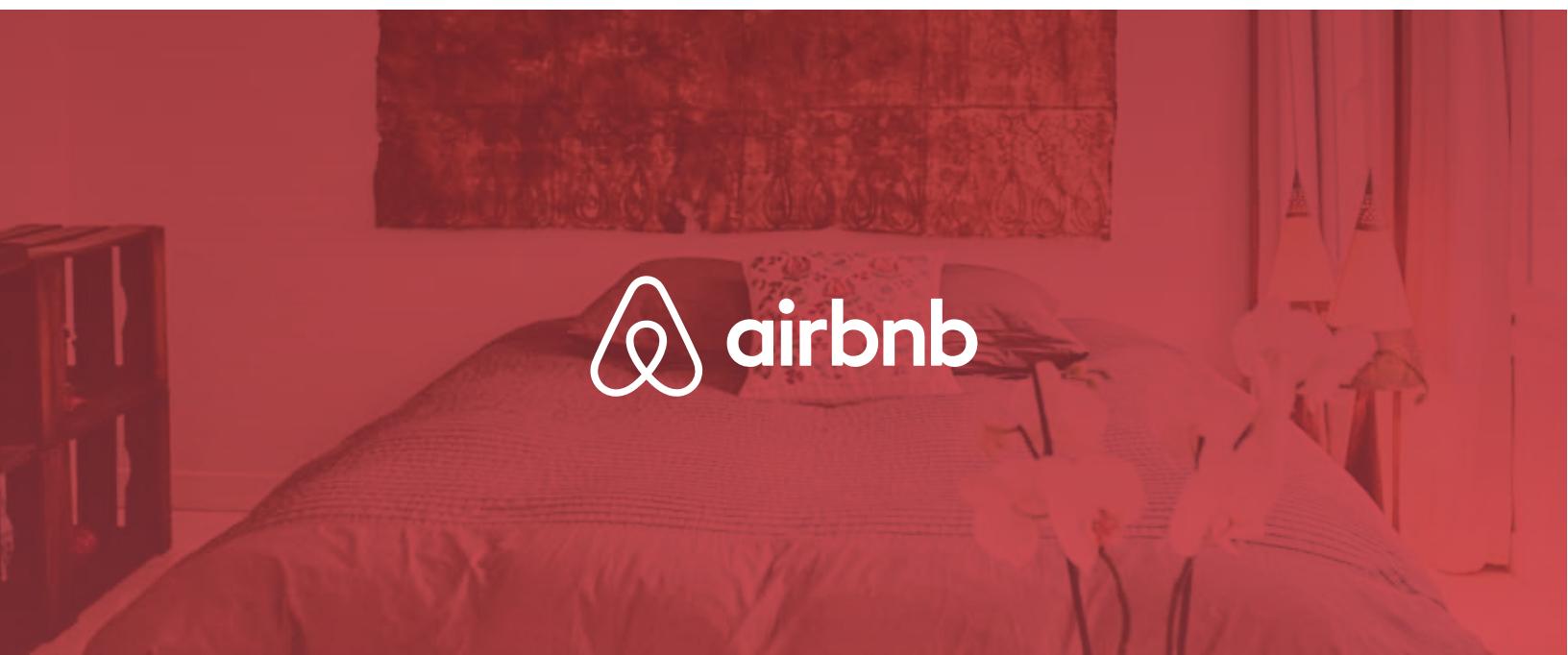


# Optimized Pricing

Ideally, a business will charge the highest price customers are happy to pay. While companies don't want to undercut themselves, charging too much can push customers to other vendors on future purchases. Artificial Intelligence systems have the power to evaluate environmental factors that may affect price in near-real time. Most people have seen this applied to airlines whose prices change daily (sometimes more than daily) in response to customer demand.



# Case Study



# Case Study: Airbnb

Airbnb has an interesting business model. Though they're a hospitality company, they don't own any rental properties. Registering as a host and browsing for lodging is free. Airbnb makes its money from a 3% fee charged to the host and a guest service fee paid by the traveler. The company earns nothing without booking. Plus, hosts who don't get as many bookings as they expect become discouraged and remove their listings, leaving the company with less coverage in that area.

Because hosts set their own prices, the company noticed a tendency for rates to be wildly inconsistent across an area. Hosts didn't have the information they needed to determine reasonable pricing. Using traditional models Airbnb could only make a "best guess" suggestion for rates based on what similar listings charged. Prices fluctuated between being too high to attract renters or too low to satisfy the host.

Airbnb is often used as a "gold star" example of data science because of its focus on using its collected data **in every way possible**. Machine learning and Artificial Intelligence aren't new concepts to them; instead, their company is built on computer-driven insight. Turning to AI to solve the pricing issue was a natural move.

The Airbnb optimized pricing system relies on Artificial Intelligence to create models for the likelihood of any given room being booked on any given night at the current price point. It takes into account factors like seasonality, special events, a listing's size and quality, and nearby amenities. The system also uses a data structure called a k-d tree to



**Data is the aggregated voice of our customers. And wherever we go next—wherever we belong next—will be driven by those voices.**

Riley Newman

quantify the desirability of a neighborhood and adds that information to the mix as well.

Hosts can access these predictions via an intuitive calendar view. Each day is color-coded to indicate whether it will be booked at a certain price point. The hosts can also view an explanation of why their pricing might be off (a local convention, cold winters, cheaper traditional hotels nearby) and are shown a graph predicting the price most likely to attract travelers. They can even set their price to follow the optimized pricing as it calculates new rates.

Bar Ifrach, Airbnb's Data Science Manager, describes the move as an attempt to appeal to hosts. "We're trying to empower our hosts with tools to price their listings and get bookings seamlessly and effectively, so we have more hosts and stays on Airbnb and more matches on the platform."

The team's work is paying off. A steadier flow of bookings is one of the factors contributing to Airbnb's swiftly rising net worth. In 2015 the company was valued at \$25.5 billion, and a year later it was already raising funds with an evaluation of [\\$30 billion](#).



# Barriers to Adoption

A [2016 study from DemandBase and Wakefield Research](#) shows a growing enthusiasm among marketing executives for Artificial Intelligence techniques and their application to corporate strategy. 80% of those surveyed were confident AI would change the face of their industry within five years. At the same time, only 10% of those same executives are currently using AI to interpret their data in ways that produce suggested courses of action. [32% say their company uses Artificial Intelligence](#) mainly for voice recognition technology. A mere 7.4% take recommendations from AI into account when making decisions.

If Artificial Intelligence is such a revolutionary force in business, why isn't every company using AI processes beyond customer acquisition?

**According to Demandbase, 60% of executives feel the biggest roadblock when it comes to AI is uncertainty about how it can be blended with a company's current technology.**

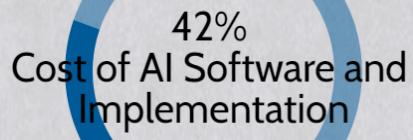
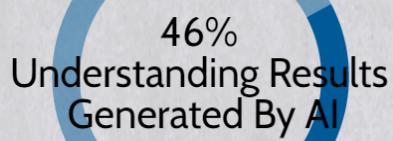
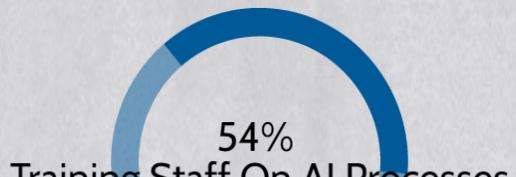
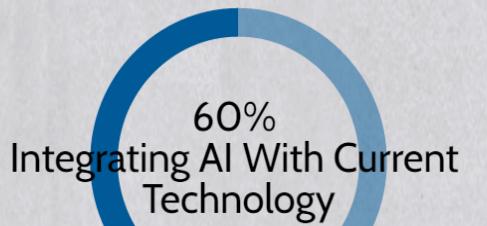
Their employees are also worried about this; [51% of data professionals](#) say their company's old data and analytics routines are the biggest barrier to adopting modern techniques.

Training staff on AI systems is a concern for 54% of executives, with 46% admitting they weren't confident they could interpret AI-generated results themselves. Finally, 42% were unhappy about the costs associated with Artificial Intelligence.



# What Keeps Companies From Using AI?

According to a 2016 study, these are the main concerns executives have about adopting AI technology.



Source: conceptainc.com



# Moving Forward

Despite these concerns, the advantages of data-based insights are fueling an increase in corporate interest.

**Investment in AI technologies for decision making are expected to rise 300% in 2017.**

In the telecommunications field, 67% of executives are making AI integration a priority.

Much of the investment will be in industry-specific apps and programs which are easily understood by people without data science degrees. This type of AI can be set up by a third-party vendor to supply insights on an intuitive virtual dashboard. Apps like this should allay the concerns of executives who worry about training or understanding data.

It's evident that Big Data has become a major factor in corporate growth. As data analysis technology gets easier to use and more companies adopt it, a growing performance gap separates companies who use their data effectively and those who don't. Executives should take a look at their reasons for putting off AI integration and consider whether the delay is already weakening their ability to compete.



Interested in learning about AI solutions for your business? Share with us the challenges you face and we'll give you an exploratory analysis and discovery proposal.

**Request a Consultation**



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