How Big Data is Changing Industries
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Big data is not just some marketing buzzword. It’s an ongoing technological revolution, which will impact everyone, from brick and mortar shops to Silicon Valley startups. It’s quickly becoming a race for businesses, and sometimes entire industries, to either keep up or shut down.

What is This White Paper About?

In this white paper, we’re looking at how big data will impact the future of the following industries: Insurance, Real Estate, E-Commerce, Retail, Direct Marketing, and Legal and Public sectors.

Who is This White Paper for?

This white paper and the information in it has been created to help professionals, including data managers, marketers, senior managers and entrepreneurs from the Insurance, Real Estate, E-Commerce, Retail, Direct Marketing, and Legal and Public sectors, and/or any other related industries.

Why Should You Read it?

You will learn how big data will influence these industries, and how your business can benefit from, and keep up with, the ongoing revolution.
Insurance

Big data analysis has revolutionized many areas of modern life, yet it hasn’t really touched insurance. That is about to change.

With tight profit margins and growing competition, many more executives plan to take advantage of the benefits big data has to offer.

“Traditionally insurance has been a slow-moving business but the pace of change frankly in the past two to three years is something I’ve never seen before within the industry.”

Seth Rachlin, VP Insurance at Capgemini

From weather patterns and demographic data to social media, new sources of data help insurers streamline costs, identify new customers, get more targeted with the risks they want to underwrite, predict fraud, and identify which claims have the potential to become very expensive.

Klayton Southwood, Director of Risk Consulting at Willis Towers Watson, says insurance executives have “fairly aggressive plans” for developing big data analysis over the next couple of years. He cites the results of a survey the consultancy conducted in the US last year.

A lot can be achieved utilizing big data, yet some of the important uses are:

Pricing More Accurately, Fast: Insurers can collect highly valuable data, in some cases in real time. This enables them to make a more accurate risk assessment and offer more competitive insurance premium pricing, leading to better customer retention, and re-sculpting their portfolio-wide risk exposure by reducing adverse selection.

Tackling Fraud: Insurers can leverage big data to cut down on fraudulent claims through profiling and predictive modeling. Big data analytics allows them to match variables within each claim against the profiles of past claims which were known to be fraudulent.

Marketing: By analyzing all of the available data, insurance companies can gain a more complete understanding of customers and can become more efficient in matching products and services with customers’ needs.
In Insurance, Location is Everything

“In insurance, location is everything. It helps insurers understand where the risks are, whether there has been accidental (or deliberate) accumulation of risk and where their customers are.”

Tony Boobier, Analytics Leader - Insurance, IBM

Most aspects of our personal lives relate to location. Many businesses realize that and are now using systems to capture, store, analyze, and visualize location data for many valuable insights. These insights help geo-target sales, manage supply chains, and evaluate risk, providing businesses with new possibilities.

Likewise, in insurance, nearly every data point has some relationship to location. Location data helps insurance companies find their customers and analyze potential risks. It also helps them optimize their distribution strategy, claims services deployment, and supply chain, and also how they market and advertise their services.

P&C insurers can probably benefit from vast location data the most. Using the following data, they can better model risk and dramatically improve their pricing and underwriting.

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crime Risk Data</td>
<td>Crime risk data and theft and vandalism frequency data, including past, present, and projected crime risk scores, give insurers underwriting and pricing advantages.</td>
</tr>
<tr>
<td>Fire Risk Data</td>
<td>For most carriers, fire represents a huge loss. Accurate data on fire risk and predictive modeling can help insurers minimize losses and improve performance.</td>
</tr>
<tr>
<td>Foreclosure Alerts</td>
<td>A property in foreclosure carries a much higher risk of vandalism, arson, or other damage. Actionable data on properties currently or previously in foreclosure allows insurers to assess risk exposure and act accordingly.</td>
</tr>
<tr>
<td>Catastrophe Risk Data</td>
<td>Using modern analytics, insurers can better manage catastrophe risk. This data can be used for accurate risk assessments based on a customer’s location.</td>
</tr>
<tr>
<td>Behavioral Data</td>
<td>Human behavior is usually not well represented in insurers’ risk models. Behavioral models allow insurers to price policies for risks associated with behavior-related losses, such as fire, crime, auto, liability, water damage, and even wind and hail damage.</td>
</tr>
<tr>
<td>Property Data</td>
<td>Residential property characteristic data and predictive analytics help insurers assign price to risk more accurately.</td>
</tr>
<tr>
<td>Latitude/Longitude</td>
<td>Data on latitude/longitude-based risk areas provide companies with a competitive edge by letting them incorporate a more appropriate picture of homeowners’ risks into rating and underwriting decisions.</td>
</tr>
</tbody>
</table>

locationinc.com
Traditionally, real estate has been a game won or lost based on hard work and old-fashioned networking, with outcomes deeply dependent on timing, detecting trends, and more than a little bit of luck.

Big data changes everything. From the way real estate professionals, buyers, sellers – and even banks – think about transactions involving property, to how these transactions are being made.

Consumers & Retail Investors
Real estate investors, mortgage professionals, and home buyers now have access to real estate information at their fingertips, thanks to a number of tools available. Many offer big data to benefit from information obtained through census, consumer surveys, property listings, geospatial mapping, and more.

Buyers and investors use hyperlocal demographic data, geolocation data, and crime data to make better buying choices, as well as understand home value trends at the city, zip code, and even neighborhood level.

Lenders & Banks
Big data helps commercial banks mitigate risk. Using big data, lenders can offer the best interest rates to their clients. Banks and mortgage lenders can also leverage data provided by insurers to safeguard their investments, using statistics and indicators to uncover potential risks, including forecasted asset depreciation.

Banks can also use big data to determine whether the price of a foreclosure or short sale matches what a buyer or investor might be offering. Big data also ensures that financial institutions don’t sell their properties for less than the market will bear.

Real Estate Agents
Big data analytics offers real estate agents and their clients valuable information on housing trends, demographics, crime data, and school quality.

Big data tools are making real estate professionals’ jobs much easier when it comes to selling too. They identify markets where demand is increasing.

Additionally, big data gives agents the ability to truly see what buyers want and are looking for in their real estate purchases.

Better Communities
Big data isn’t just providing new information to consumers; it also fuels new ways of looking at developments and community planning. A great example is the Hudson Yards project, a development of a new bank of commercial and residential units in Manhattan.

According to the proposal by the developers and New York University, planned spaces will be equipped with sensors that will track the quality of air, traffic, energy use, and much more.

Using such data, real estate developers can learn what kinds of spaces work best in terms of tenant health, energy efficiency, and other points.

Building Management
Managing a property can be an in-depth and tedious endeavor. Big data can help to simplify and streamline this process by identifying issues, speeding up repairs, slashing expenses, and much more.

Any information that is collected on equipment within a structure can be used by an algorithm to determine how each component within the space is functioning. As soon as a deficiency is identified, a work order to fix the issue can be generated.

Investors
Real estate investors can gain insights and project future trends using big data. It can provide a look into market trends and future tenants’ needs/wants. Information like energy efficiency, traffic patterns, air quality, health, demographics, and sociology can all play a factor and give investors an advantage.

Likewise, predictive analysis can help investors determine future values at the spatial scale that is relevant for every transaction, identify best prospective tenants, and use this information to adjust marketing strategies.

“How big data is making the commercial real estate industry more transparent. It becomes a partner to the players and to the community, whether they’re brokers, lenders, investors, or owners.”
Ely Razin, CEO of CrediFi
E-commerce

Global e-commerce sales are projected to double from $1.6 trillion in 2015 to $3.6 trillion in 2019. That represents just 12.4% of total retail sales. With big data coming into play, e-commerce is now a hotter market than ever before.

Online retailers can now use large collections of data to improve the shopping experience, increase customer satisfaction, and determine which products, pricing, and advertising are best to maximize their profits. Here are just a few ways that e-commerce benefits from big data.

**Personalized Experience**

Personalization creates customer loyalty, and customer loyalty is the ultimate competitive advantage in the world of e-commerce. Collecting data about click patterns, loyalty programs, and customer purchase history can be used to improve personalization.

A great example is Amazon. None of the shopping suggestions you get are a coincidence. They’re the result of many bits of data that the retailer has collected about your online behavior. Not surprisingly, its sales increased by 29% right after the feature was first implemented.

**Security & Compliance**

Big data analytics is a big deal for cyber security because of the insight it contains. Information such as log data, flow data, threat intelligence data, and contextual data provides security teams with a complete view of possible threats and better protection as a result.

Some companies are using transactional and crime-based geolocation data to minimize credit card fraud, identity fraud, and fraudulent returns. This has been highly relevant ever since the PCI DSS compliance regulations were introduced.

**Predict Future Industry Trends**

Big data technology helps e-commerce companies stay ahead of the curve by enabling them to proactively identify changing patterns in consumer behavior, predict trends, and forecast demand to avoid loss and boost profits.

For example, Red Roof Inn has increased their number of online bookings by 10% using data to predict flight cancellations based on weather. Using search, pay per click (PPC), and SoLoMo mobile campaigns, the hotel chain delivers highly targeted ad campaigns to its customers.

**Better Delivery Management**

Real-time delivery management analytics (think weather, traffic, and geolocation data) can be used to keep better track of shipments and eliminate return fraud. This data is particularly important for online sellers of high-priced, perishable, and/or time-sensitive goods.

The rise of sensor technology adds another dimension to delivery management. Cheap sensors can be placed in packages of high value goods. The sensors help determine the conditions and delivery time of the package, and send that information back to the customer.

**Increase Conversion Rates**

Big data allows online retailers to analyze every step of the buyer journey and better segment their customers. This is becoming particularly important during times when the average consumer uses as many as three to five devices or platforms during the course of his/her buying journey.

Understanding where, when, and how customers shop, and when shopping cart abandonment is likely to occur, enables retailers to adjust strategy accordingly. This ultimately improves online conversion rates and optimizes the shopping experience, a win-win for retailers and consumers.

**Compete on Value Rather Than Price**

Companies can now create highly personalized experiences and improve their customer service to the point that price becomes irrelevant. That’s the current trend - companies are shifting to dynamic pricing, effectively making it less important.

Amazon is a great example, as it can quickly access a competitor’s pricing and respond with its own deals, sometimes changing pricing as much as ten times per day. Companies must now find other ways to keep their customers around.
“What we’re finding is that it’s still about location, but this time it’s about the location of the customer. Where is that customer and with whom does that customer also live? That’s what’s really important in the world of e-commerce.”

David R. Bell, Professor of Marketing at The Wharton School

E-commerce: Location, Location, Location

One of the main misconceptions about e-commerce is that the online world is somehow disconnected from the offline. But the latest study from marketing professor David R. Bell at the Wharton School proves otherwise.

Location, according to the research, is very important. That’s because the realities of the offline world determine where your online customers are going to come from. Here’s one of the examples Bell cites in his research:

“The firm that we looked at – Bonobos.com – is a men’s fashion retailer. What we found was, in locations where customers were more apt to talk to each other and trust each other, there was a greater sales diffusion online. The target customer in this case is a male, aged 25-45, who is somewhat fashion-forward.

It turns out that a good proxy for where those males are congregating is the number of bars and liquor stores per capita in a location. We had some sociological theory that told us about interaction and then we were able to go to public data and find a variable that was actually a pretty good proxy.

So, it’s tying those things together, thinking about the theory and then trying to find a proxy with real data.”

Bell found that up to 50% of Bonobos customers came through offline connections. The information about the store was shared from one customer to another in an offline environment. To get up to 50% of customers essentially for free is a game-changer in a competitive environment.

You may be selling worldwide, but your products are being bought in specific geographic locations. Knowing where your customers are not only helps improve the relevance of your ad copy, images, and messaging, but it can also achieve much more than that.

Individuals choose where and how to live, and these choices lead to specific neighborhood clusters.

Neighborhoods tend to be formed by people who share demographic characteristics, lifestyles, and preferences for certain types of goods and services. Marketing studies show that people who live in similar neighborhoods have similar buying behaviors, whether they live in NYC or Dallas.

Moreover, people who are in close (physical) proximity to one another not only consume similar products and services, but also share information about the things that they like. Birds of a feather do indeed flock together.
In the past decade, with rapid technological progress and online retail booking taking over, retail chains have fought hard to keep up. Many brick and mortar companies have realized that their model offers very specific opportunities to understand customer behavior that their online competitors simply can’t match.

Big data analytics are now used at every stage of the retail process, from predicting trends and forecasting demand, to optimizing pricing and identifying the customers most likely to purchase a particular product or respond to a promotion.

**Identifying Customers**
Knowing which customers are most likely to purchase a particular product gives retailers an incredible advantage. By relying heavily on data collected through transactional records and loyalty programs both off and online, retailers can better match their customers with the right products.

**Optimizing Pricing**
Algorithms track competitor activity, market demand, and inventory levels, automatically responding to market changes in real time, and enabling retailers to take action immediately.

Big data also determines the best timing for price changes. Studies show that this approach beats the traditional "end of season sale" approach 90% of the time.

**Mitigating Risk**
Access to behavioral and crime data can help retailers with everything from site selection and loss prevention allocation, to ensuring the safety of its employees and customers.

For example, a retailer looking to move a store to a new location with a better lease and higher traffic might use big data to uncover high risk crime areas within close proximity to the proposed location. The retailer then uses this information to justify additional security resources in the budget.

Or maybe the retailer needs corporate buy-in to deploy security guards in certain high risk stores to further fortify the location and reduce shrink. Big data, especially if it is used to determine when and where to optimize security spending, can ultimately improve a retailer’s bottom line.

**Predicting Trends**
Retail brands and marketers now use forecasting algorithms, which analyze social media posts and web browsing habits to find out about popular trends.

Machine learning technologies are used to perform “sentiment analysis” and predict what the top sellers in each category are going to be.

**Forecasting Demand**
Using demographic data and economic indicators, retailers can now build a picture of spending habits across a targeted market.

Some retailers, for example, have found that the demand for books increases exponentially as the weather gets colder. So now, when the weather changes, they increase the amount of book recommendations.
Kroger collects and manages data for about 770 million consumers. Using big data analytics, Kroger achieved greater, more actionable insights on customer loyalty and profitability. The company has developed an award-winning loyalty program with nearly 60% redemption rates and over $12 billion in incremental revenue.

According to one report, their loyalty and data driven buying pattern analysis programs allowed Kroger to stay profitable, even during the recession of 2009.

In its Dallas-Fort Worth area stores, Nordstrom deployed systems using Wi-Fi signals to monitor all customers' movements and behavior. This helped the fashion retailer, with 225 stores and over $10 billion in annual sales, better analyze shopping trends and improve customer service and ad targeting.

They also generate lots of data from their audiences on Facebook, Pinterest, and Twitter and use it to predict trends, improve targeting, and optimize pricing.

Among other objectives, Macy’s has used big data to create customer-centric assortments. Macy’s can analyze a large amount of different data points, such as out-of-stock rates, price promotions, and sell-through rates. Then, they combine these with SKU data from a product at a certain location and time, and customer data, to optimize their local assortments to the specific customer segments in those locations.

As a result, the retailer managed to increase store sales by ten percent over the past few years.

Walmart has developed its own big data software tools at Walmart Labs. The more notable ones are ‘Social Genome,’ ‘ShopyCat,’ and ‘Get on the Shelf.’ ShopyCat, for example, is able to recommend suitable products to Facebook users based on the hobbies and interests of their friends. Walmart uses Social Genome to reach customers and friends of customers, who have mentioned something product related online. Then it informs them about that exact product and includes a discount.

The US retail chain of almost 9,500 stores uses big data to make it possible for suppliers to examine real-time operational and retail data. Now their suppliers can learn what products from other suppliers ended up in the same shopping basket with their products.

This allows them to work up cross-promotional agreements with other suppliers to increase the sales volume for both parties.

One of the largest Japanese retail enterprises uses big data to personalize the shopping experience. They collect, store, and analyze over two terabytes of transactional and clickstream data across 2 million registered customer interactions, so they can provide customers with recommendations on what to buy.

Understanding customer preferences has helped the retailer cross-sell and upsell products, and build new revenue streams.
"With leading companies such as American Apparel and London City Airport already onboard with location analytics, it will become commonplace in venues — especially for major brands — over the next several years and a major competitive gap for those that don’t adopt the practice."

Harvard Business Review

With the growth of a range of technologies, including mobile devices, existing in-venue Wi-Fi networks, and low cost Bluetooth-enabled beacons, setting up location analytics at a minimal cost is easier than ever before.

The ability to gather a range of customer information gives a retailer major insights and data to leverage when it comes to store design, marketing, operations, and strategy. Combining location data with existing customer data such as preferences, past purchases, and online behavioral data allows retailers to gain a more complete understanding of customer needs, wants, and behaviors. This understanding provides true competitive advantages.

The value of location analytics doesn’t end with in-store data. Businesses can now get a much better idea of whether their stores will be successful in a particular area. By mapping key area demographics, crime rates, shopping habits, and competitor locations, retailers can now create highly accurate feasibility analyses and estimate both risks and active demand.

Likewise, by analyzing competitor outlets in the area, retailers can establish whether the product or service supply hasn’t already outstripped the demand.

Moreover, retailers can not only find an ideal location by analyzing a range of variables, such as income, crime, and demographics, they can also go way beyond a snap-shot in time and evaluate micro- and macro-trends in an area. For example, what consequences might future housing or infrastructure developments potentially bring?
Direct Marketing

According to the United States Postal Service, 98% of people retrieve their mail daily, 77% sort it immediately, and 42% stop and read it.

That means that nearly half of the direct marketing target audience is actually reading it, compared to an average of 0.2% for digital ads. And according to data from the DMO Council, the response rate for direct mail is 4.4%, compared to 0.12% for email. In other words, direct marketing is still highly efficient.

Direct mail is where marketers began to segment, split test, customize, target, and measure the results of their actions. Today, with access to big data, direct marketing industries enter a completely new world of possibilities.

Better Targeting & Personalization

Targeted direct mail ensures that the marketing message gets to the right people. The days of “batch-and-blast” ads are long gone. Today, marketers can’t succeed without analyzing data to get actionable insight, which drives targeting, personalization, and timing.

Studies show that consumers remember just four of the 3,000 messages they see. Personalized messages make customers feel unique, which, in turn, facilitates brand loyalty. Big data allows direct marketers to achieve this brand loyalty.

Single Customer View

In today’s connected digital world, big data and direct marketing work hand-in-hand. But data is only good if it’s used and actionable. In order to better target customers and personalize messages, marketers now create 360-degree customer profiles based on available big data.

They aggregate multiple online and offline data streams to create a single marketing view on these profiles. The more extensive their data is, the higher ROI they’re likely to get.

By exploiting the location element of data, direct marketers can supercharge their data in the following ways:

Direct Mail

Using location analytics, businesses are able to target their customers more precisely than ever before. Marketers can identify the location of highly desirable customers instead of marketing to anonymous masses. This can effectively reduce customer acquisition costs, build highly relevant customer awareness, and deliver massive ROI.

Offline Advertising

Marketers can use location analytics to improve the efficiency of offline advertising spend by selecting publications and display locations local to the area where potential customers are most likely based.

For example, according to research by Kantar Media, the most common gym customers in the UK are 24-34 years old working full-time in finance. With the power of location analytics, marketers can identify the most relevant neighborhoods to target their ads.

Flyer Handouts

Flyers can be cheap and personal. However, it’s quite challenging to deliver a relevant message to the right customer. With location analytics, direct marketers can identify busy areas with high traffic in their targeted, customer-rich neighborhoods.
Legal, Policy and Beyond

Big data and analytics are driving advancements that touch nearly every part of our lives. Many industries are gaining clear benefits from analyzing and visualizing the vast amounts of data that is created.

With time, even conservative industries are waking up and actively seeking the direction big data will provide. From litigation practice to public policy, big data can reduce costs, improve productivity, and even save lives across the private and public sectors.

**Policymaking**

When elected officials draft policies, they lack access to advanced data analytics that would help them understand the economic implications the proposed legislation would have. Members of Congress don’t typically receive a detailed analysis of a bill until after it has been written.

Big data can answer many questions. For example, how will changes to immigration policy impact the job figures and the GDP? How will tax reform influence the budget, economic growth, and income distribution? What will be the impact of new investments in health care, education, and roads?

**Education**

Big data also makes it possible to mine learning information for insights regarding student performance and learning approaches. For example, Arizona State University uses software that analyzes students’ keystrokes to better understand their learning progression.

The software gathers information from the devices that students use and combines learning skills, grades, strong and weak points, as well as hesitation patterns when using the computer mouse.

**Public Transport & Logistics**

With big data, authorities achieve a better understanding of the customer demand on different routes. They can map customer journeys across multiple modes of transportation, including buses, subway, and trains/high speed rail. Then, they can use this data to plan future routes, modify the frequency on existing routes, and understand the number of buses, subways, or trains needed on each route.

By leveraging big data, local governments can predict optimal equipment maintenance requirements for buses, subways, trains, and tracks. Sensors installed on the equipment can predict upcoming faults at the individual component levels, such a stretch of rails, or specific brakes.

**Urban Planning**

Urban life has become increasingly dynamic, whereas city planning often relies on static, traditional methods. But the growing source of big data is providing a fresh outlook.

Urban planners can now make decisions based on geo-referenced data, such as socio-economic data of people, land use, infrastructure networks, mobility traces, emotional responses, climate, and pollution.

The industry is now moving towards big data-informed urban planning, which utilizes and relies on data-backed knowledge throughout the process.

**Legal Services**

Of all the industries, legal could benefit most from big data advances. The legal industry has always worked with a lot of data, but most of it remained on paper. Ongoing digitalization of all of this data opens vast new opportunities to improve their work.

Lawyers can now easily connect different kinds of (open and public) data sets, providing clarifications and new insights. But the possibilities go way beyond that. There will be an impact on litigation, marketing, and internal operations. For example, one software tool, Juristat, can even predict how a flu outbreak might affect a jury verdict.

**Compliance**

The ability to access, store, and analyze vast amounts of data will certainly benefit highly regulated industries such as finance, insurance, or pharma. But it can benefit businesses on an even more basic level, and help them prevent fines and penalties.

A great example is the EEOC v. DHL Express case, where a global shipping company was accused of assigning delivery routes to drivers based on their race and the neighborhoods’ demographics. With access to quality demographic data, the companies can now better monitor how jobs are distributed, and avoid similar, costly litigation.
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