TRANSFORMING BIG DATA ANALYTICS INTO A COMPETITIVE ADVANTAGE FOR INSURERS
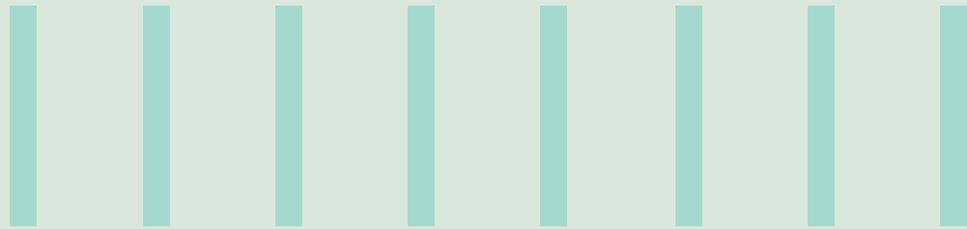
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Insurers are facing a significant rise in data volumes

Today, the amount of data available to organizations has grown manifold, thanks to the large-scale transformation in the way consumers communicate. However, having access to rich sources of data and using that data to enable effective decision-making are two separate aspects. Finding the right blend of what, why and how to use this enormous amount of data is something that needs attention in today's competitive business environment.

Big Data—enterprise data that is structured/unstructured and generated from traditional/non-traditional sources, and/or in real-time—has been a hot topic for a while now. Yet, organizations are still gaining familiarity with the valuable insights and analysis it has to offer, if used effectively. Insurers are being swamped with a huge quantities data daily and

the volumes continue to pile up with the accumulation of historical data from policies, claims, etc. and consumer behavior data generated from various digital channels. Although this data is used for various isolated objectives, it is important that insurers understand how to make use of the rapid pace, variety, and volume of data to transform their businesses. Traditionally, in the insurance industry, the use of basic transaction-based data analytics has been limited primarily to core business activities. Big Data analytics is still not a priority for insurance organizations and those aiming to leapfrog the competition need to make a move to cash in on the benefits of Big Data. A quick glance at the challenges facing today's insurers, gives a clear indication why utilizing this data effectively is all the more important now.

Challenges impacting the insurance industry

A consistently evolving business environment, increasing competition, growing risk concerns, etc. are now considered to be part of the "new normal" operating environment. These apart, there are several other specific challenges plaguing today's insurance business.

is important that insurers leverage vital insights from this data to enhance pricing mechanisms, understand consumer behavior, safeguard itself from fraudulent claims, and much more.

Along with mobile, social, and cloud innovations, the dawn of Big Data tools and new analytics capabilities will be the primary platforms for innovation across

collate more precise information about the number of transactions, product performance, customer satisfaction, etc. With Big Data, detailed segmentation of customers can be performed in order to align products with their preferences. While there are various areas of application for Big Data technologies, we specifically look at a select few as they have the potential to significantly transform the insurance

Manage risks profitably	• Competition and rising levels of risks are impacting growth and profitability	• Auto insurance, for example, is highly price-sensitive and hyper-competitive. Customers change insurers frequently based on the lowest quote available to them	• Auto insurers are increasingly facing a tough task in terms of offering the best quote while managing risks and maintaining profitability
Identify fraud effectively	• Insurers cite widespread insurance fraud and affirm heightened costs due to fraudulent claimants	• According to a recent survey, more than two-thirds (71%) of claims officials at European insurance companies have seen a surge in the number of fraudulent claims over the past 3 years	
Prevent identity theft	• The Federal Trade Commission estimates that as many as 9 million Americans have their identities stolen each year	• Medical identity theft is a growing area of concern for insurers. A recent survey shows that in the US alone, the total losses to insurance companies due to medical identity theft amounted to as high as US$41 billion for 2012	
Design products best suited For consumers	• Consumer behavior varies in terms of the type of insurance products they are looking for. Firms have to move towards customer -centric models and design products that suit their customer's needs have become a real challenge.	• According to a recent study, offering the right insurance product provides customers with higher satisfaction levels, which in turn helps in building loyalty and generating more business	
Acquire new and retain existing customers	• Insurance products have become mostly commoditized and customers are selecting the insurer purely on the basis of price	• With little variation between product/service offerings, it is really challenging for insurance companies to acquire new customers and retain existing ones.	

Figure 1: Challenges impacting the insurance industry

These challenges are forcing insurers to more rapidly generate new insights from available data—in some cases, in real-time. With the rise of Big Data technologies, it

many business lines in the financial services market today. By leveraging Big Data technologies, insurers can record more transactional data in digital form,

business. Figure 2 indicates the insurance business transformation opportunities provided by Big Data.

Risk-based pricing and premium growth through the power of Big Data analytics

Increasing premium volumes is the most important goal for insurers. An important aspect of this pursuit is to deliver competitive price and rate adequacy for segments that have not been tapped so far, such as new geographies and different classes of risks. One chronic hurdle in attaining this goal has been the lack of reliable data. However, with the power of Big Data, insurers can now leverage sources like social media, surveys, sales demographics, claims data, geospatial data, telematics, etc. to understand unknown correlations that can help them price policies effectively.

Take auto insurance as a use case. Big Data can be of tangible help in identifying the accurate insurance premium for an automobile on which insurance is desired. For a particular model, its user reviews, owner experience, ratings from sources like blogs, auto forums, social media, etc. can be leveraged to conduct a sentiment analysis. The results can then be used to categorize

Figure 2: Insurance business transformation opportunities with Big Data

the automobile into an appropriate category, which can allow the insurer to set varying premiums based on the condition of the motor vehicle.

Figure 3 provides a case description. Competitive and differential pricing based on reliable risk categorization can go a long way in improving premium volumes by charging higher for riskier insurance

products. With Solvency II, accurately calculating risk-based capital becomes even more critical as it directly impacts the least amount of capital that needs to be reserved. The use of Big Data analytics can not only better correlate premiums with risks but also offer a dual benefit of obtaining a detailed view of risks.
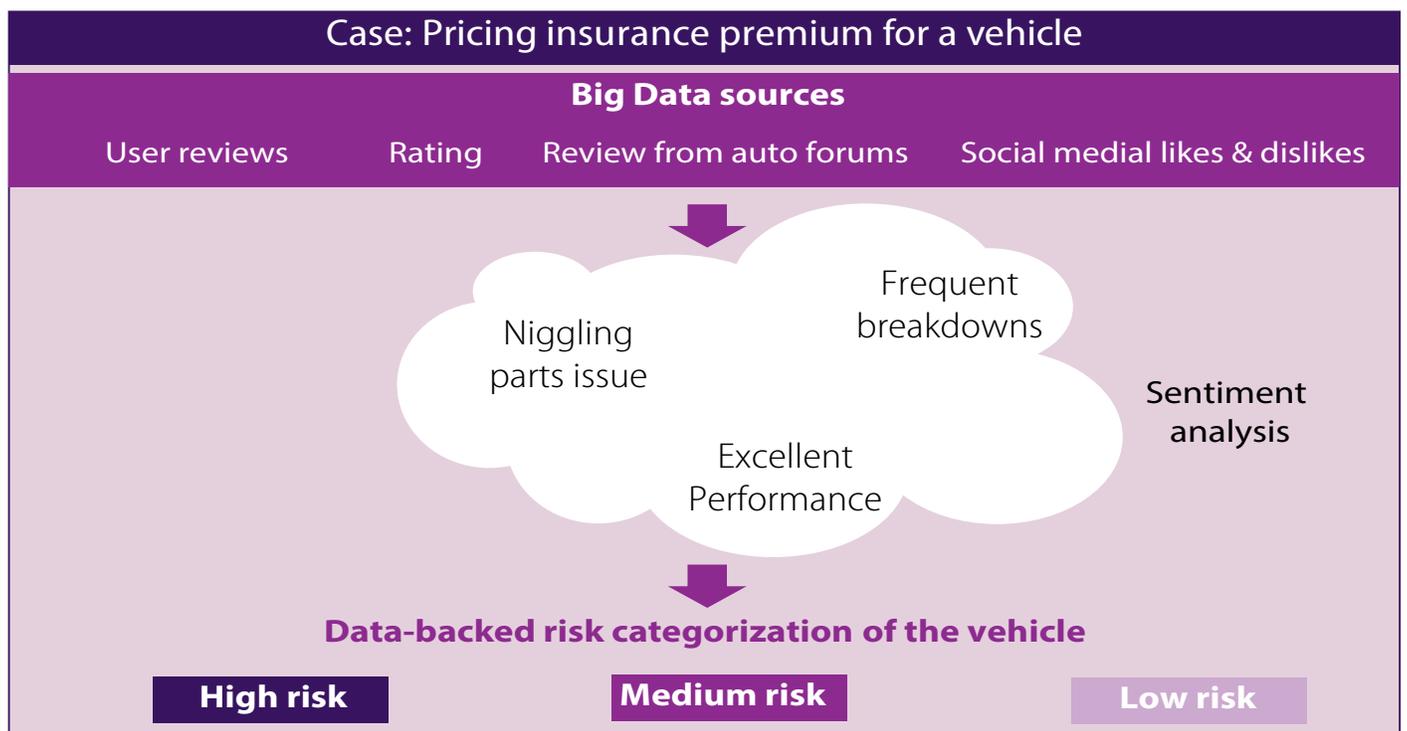

Figure 3: Pricing insurance premiums for an automobile

Identity verification and entity resolution through Big Data analytics

Individuals are not always who they say they are. As a result, insurance companies face huge challenges in identity management and are constantly in need of ways to enrich the efficacy of their identity verifications.

Big Data can provide the answer—by delivering valuable real-time insights based on data from thousands of dissimilar sources that can be taken together to form a multifaceted view of an individual. This can enable insurance companies to resolve identity issues with little disruption to their business flow.

For instance, during the underwriting phase, insurers can deploy Big Data solutions that scrutinize people's identities by probing and examining enormous volumes of data rapidly. This data can be leveraged to conduct link analyses, clustering analyses, and complex analyses to determine and authenticate the identity of policy applicants, thereby ensuring that a match between an individual and his/her identity. Refer Figure 4:

Figure 4: Identify verification through Big Data analytics

Empowering insurance claims fraud detection through Big Data analytics

Solutions for analyzing high volumes of data are important in addressing the increasing prevalence of insurance claims fraud. Insurers need ways to identify possible fraudulent claims and facilitate rapid visualization and reporting to improve continuing anti-fraud efforts.

The use of Big Data solutions can play a big part in empowering insurance companies in their fight against fraud. For example, during claims intake, companies can use Big Data solutions designed to collect and analyze flowing data from multiple sources (such as social media posts) to make informed investigations and policy decisions. This can help insurers discover, for instance, whether a policyholder is being honest about the details of a particular accident and if services rendered are legitimate.

A case in example—a particular injury claim could possibly include forged medical claims or a fake accident. By applying Big Data analysis, the insurer can rapidly look for trends in past claims, identify resemblances, and deliver fraud propensity scores to claim intake experts in real time. This can eventually help claim intake specialists adjust their line of inquiry and direct doubtful claims to investigators, empowering companies to detect and report fraudulent claims very early in the cycle.

Using Big Data analytics to design products and services

Needless to say, the happier the customer is with a product, the higher he is going to rate the insurer in terms of customer satisfaction. In today's competitive world, an insurer needs to offer products and services that align to the customer's demands.

Big Data analytics can help in apprehending customer demands, interests, needs, etc. using data from various social media channels, surveys, blogs, etc. The insights generated from the analytics tools can help the product and service designing team to launch/modify

an offering as per the customer's interests.

For example, actuaries can use data factors relating to an automobile's condition (age, performance, value, security, etc.), driver (age, employment, driving history, etc.) and location (area of use, climatic conditions, etc.), and apply analytics tools to understand customer behavior, preferences, buying capacity, premium paying capacity, etc. Armed with this information, insurers will be able to perform an exhaustive segmentation of customers and more precisely tailor products or services. Additionally, insurers can also deploy Big Data analytics to develop next-gen products and services.

Big Data analytics for customer acquisition and retention

Many insurance products have become commoditized and customers these days select their insurer mainly on the basis of price. With little variation between product/ service offerings, it is challenging for insurance companies to acquire new customers and retain existing ones. Insurers need a framework of capabilities that enable them to predict customer/prospect lapse so as to devise strategies to improve customer acquisition and retention.

Using analytics, insurance firms will be able to decrease the cost of customer acquisition. Predictive modeling can help insurers decide where to allocate budgets to obtain maximum ROI. It will look at a combination of data

sources (like blogs, surveys, feedback forums etc.,) and leverage an analytics engine to analyze the collated data. Predictive modeling will enable insurers to find the right "hotspots" and launch their marketing campaigns targeting the right set of prospects.

Similarly, using analytics, insures will be able to retain customers through effective communication and cross-selling. Analytics will enable cross-selling by determining the best product or service for an existing customer based on buying patterns, demographics, etc. Using information provided by the analytics tool also enables firms to send the right message at the right time to the right customer. For example, a reminder mail/letter when a premium payment is due.

Analytics enables insurers to create a thorough roadmap for handling the complete lifecycle of a customer, from acquisition to maturity or lapse.

Preparation for Big Data adoption

Although the use of Big Data technologies promises many potential benefits to insurers in the near future, insurers must be ready to undergo a challenging journey to get their organizations ready for actual adoption and implementation of Big Data technologies. The checklist for key Big Data preparedness variables for insurers is described in Figure 5.
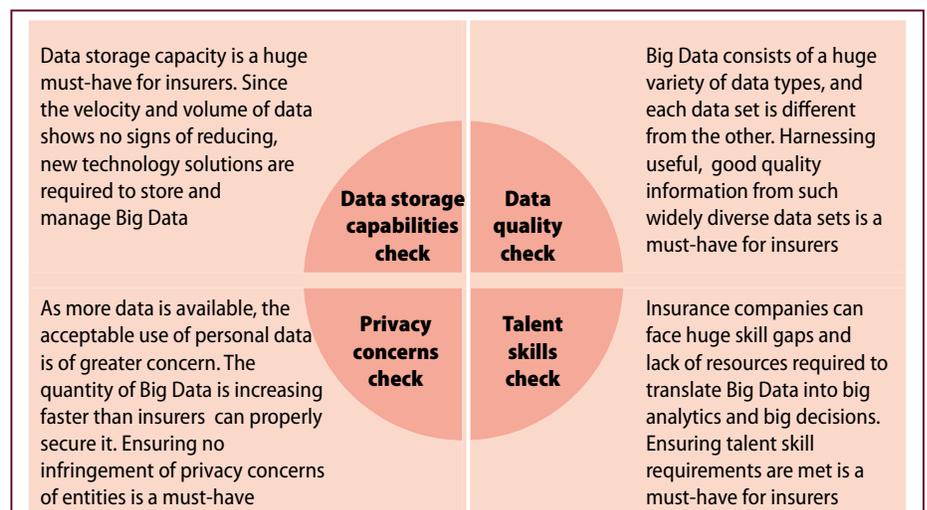

Data storage capacity is a huge must-have for insurers. Since the velocity and volume of data shows no signs of reducing, new technology solutions are required to store and manage Big Data

Big Data consists of a huge variety of data types, and each data set is different from the other. Harnessing useful, good quality information from such widely diverse data sets is a must-have for insurers

Data storage capabilities check

Data quality check

Privacy concerns check

Talent skills check

As more data is available, the acceptable use of personal data is of greater concern. The quantity of Big Data is increasing faster than insurers can properly secure it. Ensuring no infringement of privacy concerns of entities is a must-have

Insurance companies can face huge skill gaps and lack of resources required to translate Big Data into big analytics and big decisions. Ensuring talent skill requirements are met is a must-have for insurers

Figure 5: Preparedness check

Big Data infrastructure for insurers

Big Data necessitates a different set of technical tools (different from the traditional tools) in order to manage it well and overcome the various potential challenges that insurers are likely to face in the implementation of Big Data solutions. Insurers need to invest in steadfast Big Data infrastructure, including:

• Focused hardware appliances designed and augmented for obtaining, consolidating, organizing, categorizing, and storing unstructured data. Examples of such Big Data technology tools include IBM Netezza, Greenplum Data Computing Appliance, Oracle's Big Data Appliance, etc.

• Dedicated databases that store and process data and capable of processing huge amounts of amorphous data. Examples: Hadoop and NoSQL. Despite the growth of NoSQL databases over the preceding few years, SQL continues to remain in popular use. In fact, it is likely that SQL (Structured Query Language) still rules the domain of Big Data storage/database tools.

• Focused analysis tools that are deliberately designed to interpret and mine "sense" from streaming data in any programming format, then process it to identify analytic arrangements. Examples: Hadoop, HParser and Data Quality Manager.

Very recently, technology vendors have answered the demand for analytics from insurance companies by launching a huge number of systems that provide full SQL query competencies with notable performance improvements over current Hive/Hadoop systems. Some of these ongoing initiatives include Facebook's Presto, an appliance that offers a query-based interface to Facebook's Hadoop data repository. Another example is Amazon's RedShift, which offers an SQL-based data repository facility that can handle huge numbers of queries.

A significant number of insurers are yet to invest and adopt the dedicated Big Data infrastructure required to harness the huge potential of Big Data in their organizations. While some globally renowned insurers have started leveraging Big Data technologies, many others still have a long way to go in this area.

Examples of insurers who currently leverage Big Data technologies

There are a few insurers with a focus on leveraging Big Data technologies to attain the optimum benefits. A few illustrations to see what top insurers are doing in this space.

Progressive Insurance

"Pay as You Drive" with Big Data analytics

• Progressive insurance, through its "Pay-as-You-Drive" program uses Big Data technology to analyze a person's driving habits in real-time and enable the driver to lower premium rates.

• Drivers need to plug a device called Snapshot, which collects a large volume of data (miles driven, time of the day, number of times the driver has braked hard, etc.) over a period of time. Based on the analysis of the available data, Progressive offers discounts to the individual's insurance premium.

• Snapshot combines Big Data analysis with mobile computing and cellular communications technologies. It is plugged into the automobile's on-board diagnostic port—as the customer drives, a large volume of data is collected in a mobile, next-generation database and later analyzed.

All State

Savings add up with DRIVEWISE

• Similar to Progressive, Allstate also uses Big Data analytics to analyze available data and provide discounts to customers based on their driving habits

• DRIVEWISE savings could result in discounts of up to 30%, based on their driving behavior

WellPoint

Leveraging Big Data for competitive advantage

• WellPoint uses Watson-based solutions (Watson is a highly advanced computer system developed by IBM) to improve patient care through the delivery of up-to-date, evidence-based healthcare

• Watson has the ability to process around 200 million pages of content in less than 3 seconds. It leverages analytics tools to analyze large volumes of data to support decision-making

• IBM will be developing the base Watson healthcare analytics tool for WellPoint based on Watson's capabilities

Figure 6: Actual use cases for Big Data

These illustrations highlight that, with Big Data analytics, insurers can offer variable premium pricing as per use, send customized marketing messages to customers, take informed decisions, and much more. The range of benefits is only expected to broaden as the use of Big Data analytics continuous to grow.

The road ahead

The majority of insurers have steady data analytics set up only for core insurance business processes. These data analytics solutions continue to depend significantly on traditional transactional data sources. The vast quantity of Big Data sources available are not being leveraged to the extent possible. Insurers that envision the best use of Big Data for transforming their business will have an upper hand going into the future.

To start with, insurers will definitely need to focus on a few prerequisites from business as well as technology perspective to realize the true worth of Big Data analytics. From the business side, insurers need to identify the main sources of Big Data, assess the available analytics solution, and build management belief as to how Big Data will benefit the organization. Essentially, insurers that will be best placed in future to benefit from Big Data and analytics will be those who have formed a culture where their business heads trust the real value of Big Data analytics and use the insights received to improve the company's strategic decision making capabilities.

Key considerations for insurers from a technology point of view will be ensuring adequate data infrastructure, considering alternate architectures, forecasting and governing future risks, expanding analytics capabilities, hiring the right expertise and altering the IT organization structure, if required. Insurers can also consider leveraging partnerships with insurance solutions and consulting services providers to guide and hasten the process of Big Data analytics application and deployment at their organizations.

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