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Insurance

White Paper

Data in the Digital Era – Driving New Business Models and Results for Insurers

About the Authors

Vinod Kachroo
CTO, Insurance & Health Care

Vinod has over 26 years of experience in the financial services industry, and has handled roles of increasing responsibility. He has worked in large scale and complex environments at AIG, Prudential and MetLife, driving business and IT transformations. Vinod leads the technology, industry solutions, innovation and domain consulting practices for the Insurance and Healthcare business at Tata Consultancy Services (TCS), as well as the digital practices that include Big Data and mobility. He brings his experience in business, applications and infrastructure leadership roles to every client engagement.

Arunashish Majumdar
Chief Architect, Insurance

Arunashish (Arun) leads the TCS Insurance technology practice in North America. He specializes in transformation initiatives to improve customer experience, business agility, operational efficiency, and technical currency. Arun has handled strategic initiatives to define and deliver enterprise digital strategy, IT portfolio simplification and core systems modernization for several TCS customers.

Arun is a CPCU, a Distinguished Architect (from The Open Group) and holds a Bachelor's degree in Engineering.

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Data is not a new proposition or challenge for insurers. However, in today's data-driven digital era, do insurers need to think of data differently as they embark on their digital transformation journeys? Is 'Big Data' mere hype or is it a new business opportunity?

We are working closely with many major insurers in their transformation journey to become digital insurers. This whitepaper describes how insurers are using data in each line of business in this new digital era. The paper also recommends that insurers use an outcome-driven approach to define their data strategy, and focus on using both internal and external data to develop a holistic view of the customer who is at the vortex of this disruptive transformation.

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Introduction

Insurers have been using data for decades — in fact, some may have even been over-enthusiastic about capturing data - both, about their customers and the risks they insure against. While most insurers can boast of having terabytes and petabytes of data in their production and archival systems, some have also used this data to improve the effectiveness of processes such as new business underwriting, renewals and claims. They have also implemented various actuarial and analytics models based on historic data to define risk segmentation, develop new product and rate designs and even marketing campaign designs. Insurers are also veterans in using external data; for example, a customer's driving history obtained from the Departments of Motor Vehicles has long been a key rating factor in calculating auto premiums. Does all this mean that insurers have maximized the value of the data they possess?

Our interactions with leading insurers reveal that is not the case — most use only a small percentage of the data they collect. Insurers therefore have a big opportunity to unlock the real power of data to realize a business differentiator. The five concurrent disruptive technology innovations (viz. pervasive computing, cloud, social media, Big Data and machine learning), which are unique to today's digital era, have provided insurers the ability to make this quantum leap.

Reimagining Data in the Digital Era

Within the insurance industry, data in the digital context has different meanings for different lines of businesses. However, across all lines of business, data is used to drive innovation and effectiveness in business models and efficiency in operations (see Figure 1). We take a closer look at the different implications data has on the various insurance businesses:

Line of Business	Changing Priorities for Data
Life & Group Insurers	▪ Provide contextualized insight to agents to help them sell and service customer better ▪ Improve overall customer experience using insights from interaction/touch-points and other sources ▪ Promote insight driven product innovation and product bundling ▪ Use new sources such as Rx databases and genome data for life underwriting
P&C Consumer Line Insurers	▪ Break the data silos and move from product centric to customer centric model ▪ Improve overall customer experience using insights from interaction/touch-points and other sources ▪ Develop innovative customer engagement models using data from multiple sources (eg. Sensors, telematics, social, etc.)
Commercial Insurers	▪ Leverage data to drive pricing excellence and more contextualized risk models and reinsurance models ▪ Move from experience based rating and underwriting to structured model approach ▪ Ensure effective use of social data
Health Insurers	▪ Enable shift from Health Care to Data Driven Wellness ▪ Facilitate seamless data integration with exchanges ▪ Improve overall customer experience and develop innovative customer engagement models using data from multiple sources (eg. Sensors, partners, social, etc.)
Brokers & Reinsurers	▪ Enable shift from Document Driven to Data Driven organization ▪ Achieve higher level of automation in data entry and submission systems ▪ Build in prescriptive insights into data driven workflows

Figure 1 – Data Priorities by Lines of Business

Life and Group Insurers

Life and Group insurers have two key requirements from the digital transformation of data — increasing efficiency of their sales and distribution models, and simplifying and/or aligning their products to the needs of consumers at various stages in their lives. Here are some instances where data and analytics can help:

- The role of the life insurance agent is transforming from that of a pure sales person to a true advisor or subject matter expert on the integrated financial wellbeing and protection needs of clients. To be more effective in this new role, agents need the right analytics of the customer's needs along with contextualized product information in real time.
- Today, life insurers rate policies based on legacy medical underwriting and heuristics drawn from historical data. Advances in genomics could change this in the not-so-distant future and may transform their business models. In the absence of historical data, data modelling and analytics can help insurers determine premiums.
- To build a holistic profile of their customers, insurers must synthesize internal, external and social data, to define innovative benefits which can be bundled to meet the unique needs of their customers. Life insurers can combine Life, Long Term Care and Retirement benefits together to make a stronger proposition for the potential buyer across their changing life stage needs. Group insurers can analyze employee data to develop more focused products or benefits, creating customized offerings that improve client-stickiness and competitive advantage.

The Canadian division of a global Life and Annuities Insurer improved engagement with its agents by creating a single view of its brokers and agents across the organization, using a light weight MDM implementation and integrating it with the operational systems.

P&C Consumer Lines Insurer

To achieve business growth through customer acquisition and retention, P&C insurers are moving away from a traditional, product-centric (auto, motorcycle, home, and so on) model to a customer-centric model. Unlike banks and retailers, P&C insurers have limited consumer touch points, and interactions occur only at the time of billing or renewal or policy change. However, they are using new disruptive technologies to overcome this limitation and build interesting customer engagement models.

For example, auto insurers can combine telematics data, location data, social data and internal policy data to reward 'good' customers. While telematics data can provide insights into the driving patterns of the consumer, the location and social information can help the insurer institutionalize a more customized and frequent rewards program (instead of the traditional renewal discount) by sending out targeted rewards coupons to the consumer's smartphone.

Property insurers can create a similar consumer engagement model by collecting and analyzing data from the various sensors embedded in connected appliances at the consumer's home: for example, insurers can use the early warning signs obtained from the sensors of a washing machine or hot water heater in the basement to inform the customer and prevent a basement flooding. This not only helps the insurer avoid a claim, but also saves the customer the pain of such an incident.

Such models can generate customer loyalty that will help in customer retention but, more importantly, improve advocacy, which is critical for new customer acquisition in today's era of social networks.

Commercial Insurers

It will not be a stretch to say that commercial insurers are large data processing companies. However, contrary to popular perception, it is not enterprise-level IT systems but often, user-created actuarial and underwriting spreadsheet models that use this data. The owners of these user-created systems maintain their own data sets and know how to process the data to derive the expected results.

Today, these owners are aging out of the system and nearing retirement, posing a critical challenge for insurers who have traditionally excelled in differentiating through experience-based ratings. This has led to a growing need for enterprise-level capabilities to process huge volumes of data (current and historic) to define real-time and customized pricing and profitability models.

In addition, commercial insurers can leverage a lot of data from social media. The social reputation data of a small restaurant can be a valuable input in writing or renewing a Business Owners Policy (BOP). Similarly, data from social networks on a Workers Compensation policy plan member showing they are participating in a high impact sport during their claimed disability period can help insurers deal with fraudulent claims.

A large P&C commercial lines insurer carried out a proof-of-value engagement, by integrating GIS data with existing underwriting data on a Big Data platform, to provide better risk analysis and management capabilities to its commercial insurance underwriters.

Health Insurer

The healthcare sector is poised for many far-reaching changes. Insurers must have the right infrastructure in place for seamless integration with the growing number of exchanges. The ability to share data with the exchanges will become a key competitive differentiator, and will necessitate the establishment of health insurance information systems to ensure accurate and consistent data exchange.

The growing emphasis on preventive care is encouraging health insurers to become enablers of healthy living, as opposed to just being a payer or provider of health insurance claims. To this end, insurers are developing digital ecosystems that help the customer lead a healthy lifestyle with optimal self-care (see Figure 2). This involves collecting data that can monitor and report healthy living habits or active lifestyles through sensors or smartphone apps. Insurers can analyze and provide prescriptive recommendations that can help improve the health score of an individual, and set personal goals for healthy living. Health insurers can also build an ecosystem of partners by sharing appropriate data that can help customers achieve their health goals, and create communities that become unsponsored advocates of their brand.

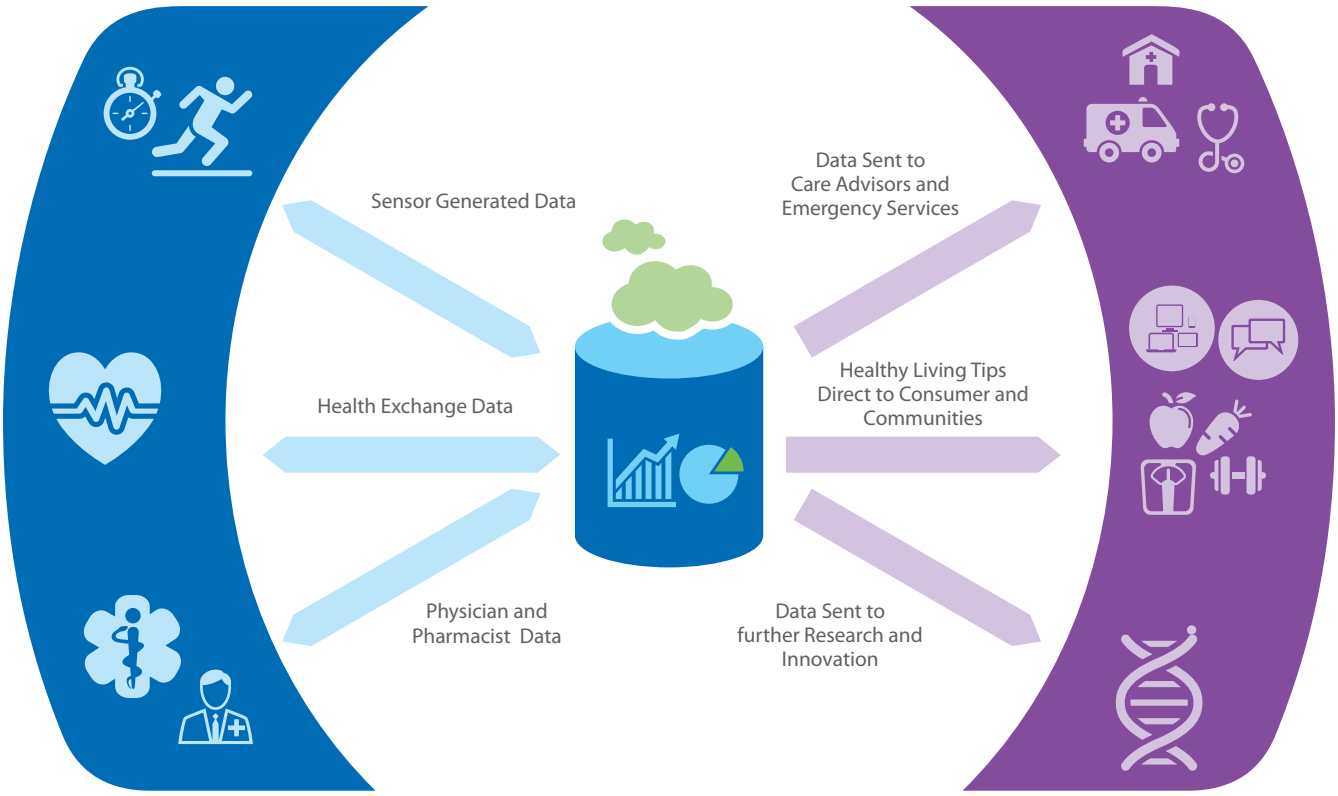

Figure 2 – Data in the Health Insurer Digital Ecosystem

Brokers and Reinsurers

Many large brokerage firms and reinsurers continue to be document-centric, with a significant amount of data captured in unstructured formats, resulting in poor data quality. Brokers need real time information on the latest products offered by the carriers, and carriers need more customer information in order to develop better products and increase wallet share.

While both brokers and reinsurers have traditionally invested heavily in business intelligence capabilities, a more data-centric model is needed today. Brokers must invest in a higher level of automation for the data entry and submission processes. As carriers assume more risk, reinsurers must improve their analysis, enable data-driven workflows and share appropriate insights with their carriers to enable business growth.

The Role of Big Data

Insurers have historically amassed huge volumes of data, but have not used all of it for decision making. Much of this is unstructured data captured in underwriter or service representative notes and customer and/or agent letters or forms. Many insurers feel that when the internal 'small' data is itself not being used to its full potential, why bother with 'Big Data' from external sources such as sensors or social media? However, insurers must realize that it is not one over the other; the true value of data lies in combining data from all sources to drive insights and

analytics, which can be used to develop innovative customer engagement models and differentiated products and/or services.

Big Data has provided insurers with the ability to examine dimensions of data — structured and unstructured, internal and external — that were not explored before, to create new business opportunities. Big Data's high performance parallel processing capabilities enable faster time-to-value from the massive terabytes or petabytes of data, and provide valuable insights in real time for better decision making.

The true value of Big Data initiatives depends on two complementary sets of capabilities working in tandem – Harnessing and Harvesting, discussed in our white paper, A Dozen Ways Insurers Can Leverage Big Data for Business Value.

1. **Harnessing** – This focuses on the first 3 'Vs' in Big Data – volume, velocity and variety. It determines what kind of data (structured and unstructured, internal and external) is to be used for a given purpose, and how it is to be stored and processed (Hadoop, SQL, NoSQL, and so on), and is a primary focus area for IT teams.
2. **Harvesting** – This is the more critical capability and focuses on the remaining 2 'Vs' – veracity and value: what business objectives can be achieved by business teams (who have the right business knowledge and understand the business context of the data) asking 'What If' questions on the data.

A TCS 2013 Global Trend Study on Big Data[1] covering 1217 companies and 12 industries revealed that about 55% of the investments in Big Data are geared towards four business functions that generate and maintain revenue -sales, marketing, customer service, and new product development.

We now discuss three use cases to illustrate how insurers can leverage Big Data in driving business value.

Creating a 720 degree View of the Customer

We have been talking about the 360 degree view of a customer for decades. The digital era has now provided data from several sources, including social media and sensors (Internet of Things), opening up a larger opportunity. Insurers can now complement their 360 degree internal customer view with an additional 360 degree view of the same customer derived from these external data sources. It is at the intersection of these two views that innovative business models of the future will evolve (see Figure 3). The examples of the telematics-based customer

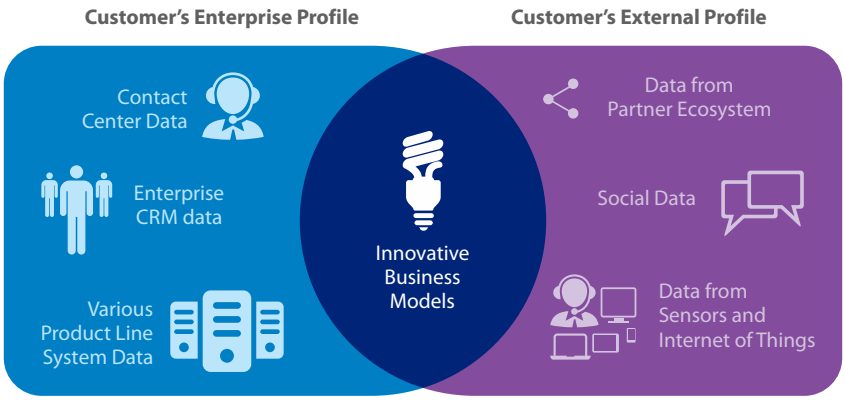

Figure 3 – Driving Business Innovation using 720 Degree view of Customer

Tata Consultancy Services, The Emerging Big Returns on Big Data – A TCS 2013 Global Trend Study, http://www.tcs.com/big-data-study/Pages/default.aspx

engagement model for auto insurers or the use of social data to substantiate general liability policy in commercial insurance (discussed earlier in this paper) are examples of the promise of this innovation. While large scale Master Data Management (MDM) and Customer Relationship Management (CRM) solutions have their own benefits and capabilities, a Big Data solution that uses a 'mash up' of internal and external customer data derived from all channels, can provide prescriptive recommendations by applying analytics on this data in real-time.

A large UK Life and Annuities insurer is utilizing a Big Data platform to analyze data from broker dealers and external sources such as LexisNexis, in order to identify lost business opportunities and enable better pricing across products.

Going from Predictive to Prescriptive Analytics

Over the last few decades, insurers have invested in building various business intelligence systems that enable descriptive analytics. These systems provided a rear-view mirror to analyze past events. Realizing this was not enough, insurers began focusing on predictive analytics, that used predictive modeling and advanced visualization and forecasting capabilities to predict future events (see Figure 4). Predictive analytics puts the power of data in decision making like never before. Now, insurers can move from predictive to prescriptive modeling by mashing internal customer and policy information with external social, demographics and/or environmental data, to draw actionable insights.

A leading insurer could have re-priced the property premiums in a region based on external data on the transition from traditional roofs to solar panel enabled roofs. This could have prevented the insurer from being caught unawares when claims starting coming in after a hail storm damaged many of the roofs.

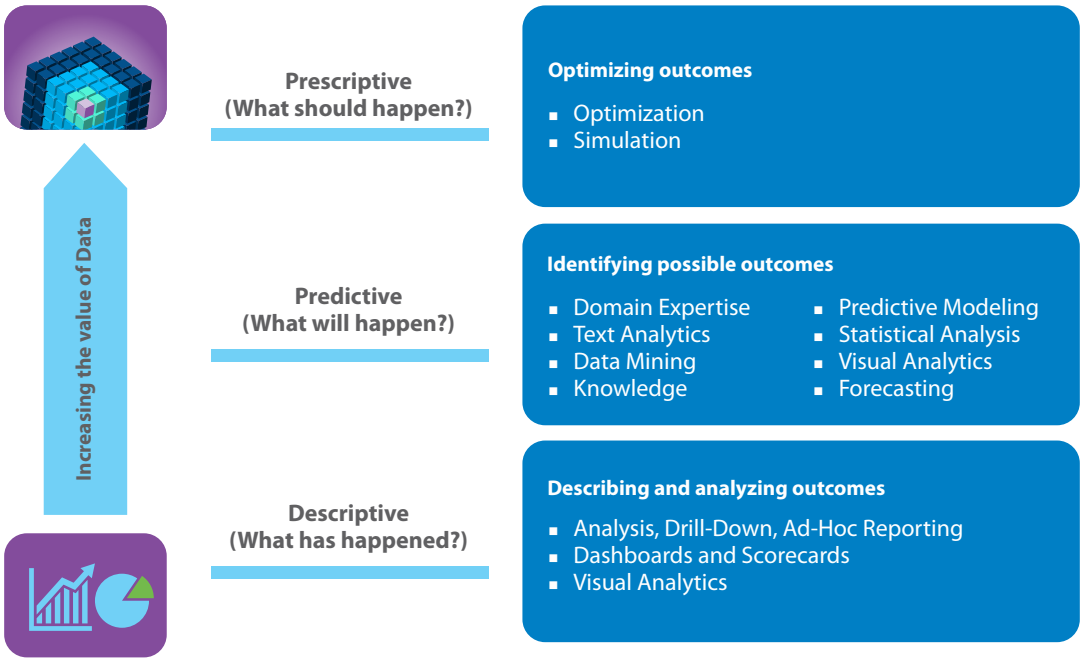

Figure 4 – Shift to Prescriptive Analytics

Managing Regulatory Compliance for Data Retention

Insurance continues to be a highly regulated industry with stringent compliance rules that require age-old data from transactional systems to be made available at short notice. However, as insurers embark on their digital transformation journeys, legacy data combined with the huge volume of data from other unstructured data sources (internal and external) can stress their storage capabilities. Big Data provides a cost effective alternative to the traditional and relatively more expensive options.

With a simple Hadoop setup, insurers can create a highly scalable and cost effective platform to archive huge volumes of structured and unstructured data. Since the Hadoop platform does not enforce a structured schema design, it can adapt to source schema changes and keep the cost down in the long run.

The ability to query and search the unstructured data will also help insurers meet compliance requirements on the retrieval of archived data, without needing to keep old legacy systems alive in a standby mode and/or developing point solutions for data retrieval and access only. Thus, Big Data can deliver business value both in terms of cost and efficiency gains, coupled with the ability to meet compliance requirements.

Focus on Business Results – 'Right to Left' Data Strategy

Most insurers have invested heavily in business intelligence or reporting capabilities such as Enterprise Data Warehouse (EDW) or Master Data Management (MDM) programs. Many insurers boast of very sophisticated business intelligence or reporting infrastructure, with a large number of reports being generated every day or month or quarter. While some insurers had reasonable success with these initiatives, the results were unfavorable for many. From a business perspective, these were initiatives with a long payback period and, in some cases, less than optimum return on investment (ROI). Many of these reports were never used by business, though they did have assigned owners and were distributed accordingly. So where did the problem lie?

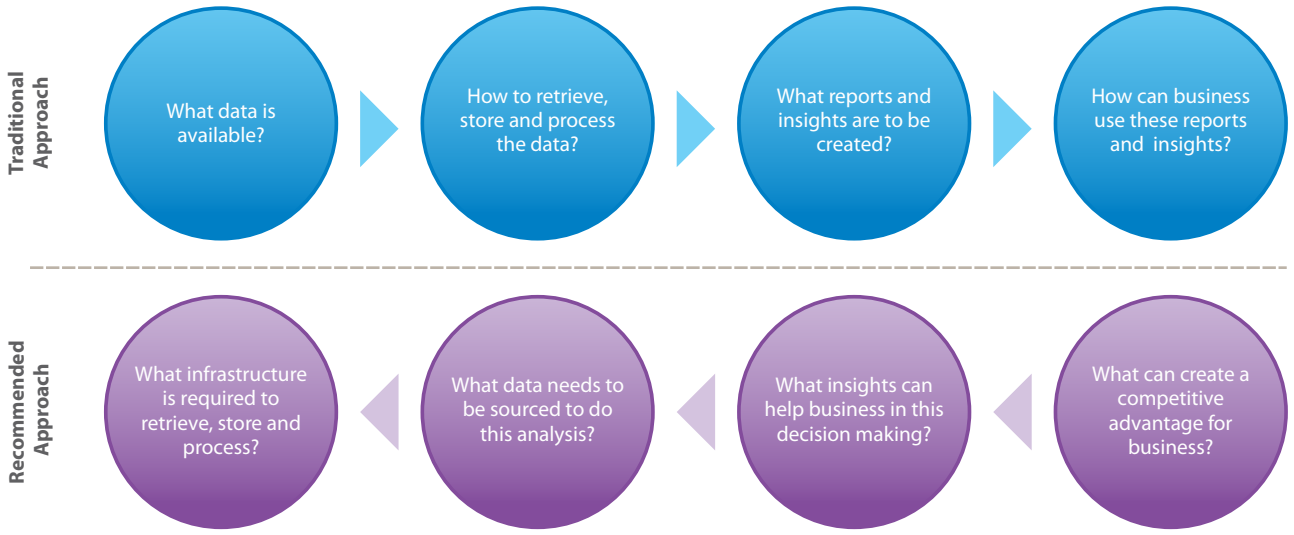

Figure 5 – Data Strategy with Focus on Business Results and Needs

Most insurers adopt a 'left-to-right' approach for enabling their analytics capability (see Figure 5). Much effort is spent in identifying the data available and the kind of data and/or analytics architecture or infrastructure required. It is usually only after the reports are created that the business considers how to use those insights for a business purpose.

We recommend reversing this and adopting a 'right-to-left' approach. Insurers should first pinpoint what insights can provide competitive advantage, and then think of the necessary data, its source (internal or external or both) and the infrastructure required to enable these insights. While a robust data or analytics infrastructure is certainly important, we recommend that organizations ensure that investments in long-term enterprise data foundation and strategy deliver continuous business value. Though Figure 5 shows the recommended approach as a sequential flow of activities, it should actually be done in an agile manner with a 'fail fast' mindset. Insurers should focus on how quickly they can learn from their experiments with data and analytics models and adapt fast, as business environments change and new technology innovations make solving business problems easier.

A large American P&C Insurance & Financial Services organization improved customer-centricity and drove higher retention and cross-sell/up-sell opportunities by creating a single view of customer, implementing various customer analytics solutions (such as segmentation and Life Time Value) and linking these to an enterprise data warehouse.

The Bermuda Triangle of Data

Data ownership, data quality and data privacy are the three sides of what we like to call 'The Bermuda Triangle of Data' (see Figure 6). This is because we have seen many 'Data Czars' get lost in discussions around these three topics and business sponsors lose interest as the discussion swirl continues. The result is that the core business imperative is lost and it becomes a theoretical debate at that point, with no valuable answers.

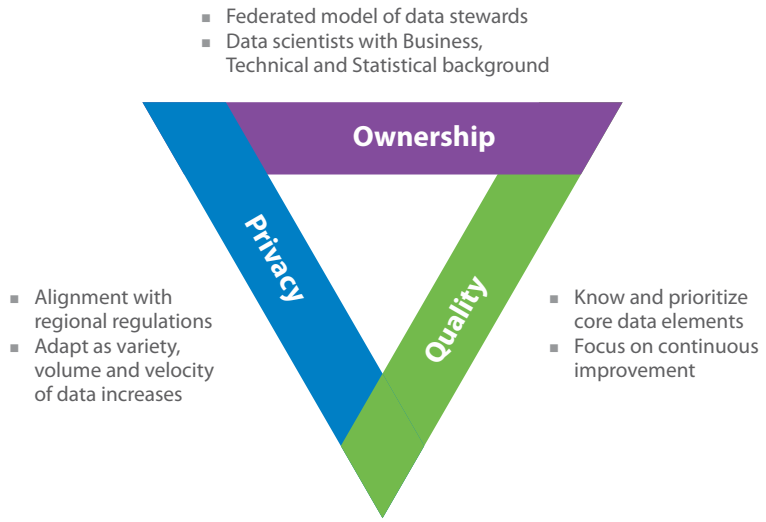

Figure 6 – The Bermuda Triangle of Data

Our view on this is to keep it simple. First, accept that this area will not be all black or white, but will have shades of grey for some more time. This is especially true now of this new digital era, with new types of data to grapple with, emerging business models that try to use this data innovatively and compliance requirements that are also evolving in parallel. Since there are no precedents in this area, insurers must be quick to adapt to these changes. This requires strong governance and agility in processes.

Finally, here are some best practices gleaned from what we have seen working well with our customers.

Data Ownership

Who owns the data within an insurance company has always been a sticky question. In addition, there can be data ownership issues outside the organization as well, across stakeholders — for example, between carriers and brokers, or between carriers and reinsurers. As insurers try to break the silos across geographies and lines of businesses, the question of data becomes even more complicated. Add to this the fact that a lot of data about the customer is also being gathered from external sources such as social media, and the complexities multiply.

We believe the answer lies in a federated data stewardship model that has accountability at the enterprise level, but has deep rooted responsibility within specific lines of businesses and/or geographies as well. The role of data scientists is becoming increasingly important. These scientists should have a strong combination of business, technology and mathematical and/or statistical capabilities and must be able to guide and take decisions on how the data should be used within the organization to create business value. We expect that in the future, this group of business-savvy data scientists will take ownership and become the stewards of data across the enterprise.

Data Quality

As insurers break down the data silos and bring in disparate sources of data across geographies and product lines, data consistency and quality will be a concern. This is especially true of unstructured data such as that from social media. As the unstructured data is present with pre-existing structured data in the enterprise, it is bound to impact data quality.

It is obvious that data quality will take a hit. So it is sensible to acknowledge this, and focus on what can be done to contain the problem at a manageable level and achieve incremental improvement. Insurers must recognize and prioritize core data elements at various points in time and focus effort towards cleansing and fixing data quality problems for those identified key elements. Over time, having the right data governance and data stewardship will ensure proactive management of data quality. For example, usage of technology (data quality, profiling tools) and feedback loops to front-end transactional systems to improve quality over time are additional measures that insurers can adopt to improve data quality.

Data Security

In this new digital era, data is freely shared and accessed through multiple channels, in various formats (text, images or videos) and across regional boundaries. Depending on the source, this data may be classified as trusted or untrusted data. In the highly regulated insurance industry, strict data regulations will always necessitate focus

on data security. Insurers should leverage the federated data ownership model to ensure their data security and data privacy policies are contextualized for the region. As insurers build new systems of engagement or extend existing systems into digital channels, current data masking and encryption processes may not be enough. Insurers must focus on sharing notice of data privacy requirements transparently with consumers and/or partners and capturing their choices and consent explicitly before they use or share their data. Self-governance must be at the forefront of all data security policies and insurers must continue to adapt as regulations become more stringent and the volume of data continues to increase at a rapid speed.

Conclusion

In these exciting times, as digital enablement leads to innovations and new business models in the insurance industry, the role data plays will continue to grow. The insurance industry is data-rich, but still has a long way to go with respect to analytics and insights. There is a need for a holistic approach towards an enterprise level data strategy and the enabling architecture and governance, to realize incremental business value.

The success of the industry will depend on its ability to process, leverage and exploit data to its advantage. Insurers must learn from other industries such as retail and banking, or from enterprises such as Google and Amazon, as to how to use data to build market share and stay ahead of competition. The industry must be smart and opportunistic in repositioning itself within its regulatory and privacy constraints. The sooner insurers learn to effectively exploit data, combining structured and unstructured data from both internal and external sources, the faster they will be able to make it a source of true competitive advantage, and turn the promise of Big Data into reality.

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