

Introduction – The New ‘Real Business’

‘The real business of insurance is the mitigation of countless misfortunes.’

—Joseph George Robins (1856–1927)

The purpose of this book is not to create a textbook on either insurance or technology, so those who are looking for great depth of information on either are likely to be disappointed. Others who need to know the ins and outs of legal case law such as *Rylands v Fletcher*, or the detailed working of a Hadoop network are also likely to be disappointed, and will need to look elsewhere. Indeed, there are many books which already do good service to that cause. Perhaps helpfully, a list of recommended other reading is shown in Appendix A. This book is somewhat different as it seeks to exist in one of the exciting interfaces between insurance and technology which we have come to know as the topic of Big Data and Analytics.

Readers are most likely to come from one of two camps. For those whose origins are as insurance practitioners, they are likely to either have taken technology for granted, perhaps turned a blind eye or simply become disaffected because of the jargon used. After all, isn't technology something which happens 'over there' and is done by 'other people'?

The technologist might see matters in a different way. Their way is about the challenges of data management, governance, cleansing, tooling, and developing appropriate organizational and individual capabilities. The language of 'apps' and 'widgets' is as foreign to the insurance practitioner as are terms like 'indemnity' and 'non-disclosure' to the technologist.

The practice of insurance, and the implementation of technology should not – and cannot – become mutually exclusive. Technology has become the great enabler of change of the insurance industry, and will continue to be so especially in the area of Big Data and Analytics which is one of the hottest topics in the financial services sector.

So there is the crunch: 21st-century technology and how it impacts on a 300-year-old insurance industry. To understand the future it is necessary to think for a short while about the past, to allow current thinking to be placed in context.

1.1 ON THE POINT OF TRANSFORMATION

The starting point of this journey is over 350 years ago, in 1666, when Sir Christopher Wren allowed in his plans for rebuilding London for an ‘Insurance Office’ to safeguard the interests of the leading men of the city whose lives had been ruined by the destruction of homes, businesses and livelihoods. Some might even argue that a form of insurance existed much earlier, in China, Babylon or Rome. Before the end of the 17th century several insurance societies were already operating to provide cover in respect of damage to property and marine, and the insurance of ‘life’ emerged in the early 18th century. It might be argued that mutuals and co-operatives existed much earlier, but that debate can be put aside for the moment.

The principles of insurance are founded on case law with the foundations of insurable interest, utmost good faith and indemnity being enshrined in the early 18th century, and remain substantially unchanged. Even some of the largest global insurance companies themselves have their feet in the past albeit with some name changes. Royal Sun Alliance can trace their history to 1710 and Axa to about 1720. Those walking the streets of London will be familiar with names and places on which are founded the heritage of the insurance industry as it is known today.

It is against that background of tradition that the insurance industry now finds itself in a period of transition, perhaps transformation, maybe even radicalization. Traditional approaches for sale and distribution of insurance products are being cast aside in favor of direct and less expensive channels. The industry is on the cusp of automated claims processes with minimal or perhaps no human intervention. Fraudsters have always existed in the insurance space, but are now more prevalent and behaving with a degree of professionalism seldom seen before. Insurers are increasingly able to develop products suited to an audience of one, not of many. Quite simply, the old rules of engagement are being reinvented.

Coupled with this is the challenge of different levels of analytical maturity by market sector, by company, by location, even by department. Figure 1.1 starts to give some indication of the way the insurance industry is structured.

But this is not just a book about an industry, or an insurance company, or department. It is as much a book about how individuals within the profession itself need to become transformed.

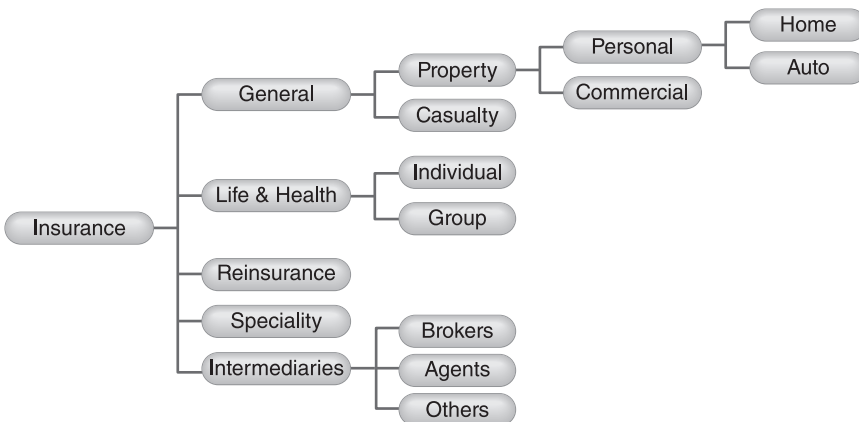


FIGURE 1.1 The insurance industry

Traditional skills will increasingly be replaced by new technologically driven solutions. New job descriptions will emerge. Old campaigners who cannot learn the new tools of the industry may find it difficult to cope. Professional institutes will increasingly need to reflect this new working environment in their training and examinations. The insurance industry as a whole also comprises multiple relationships (Figure 1.2), some of which are complex in nature.

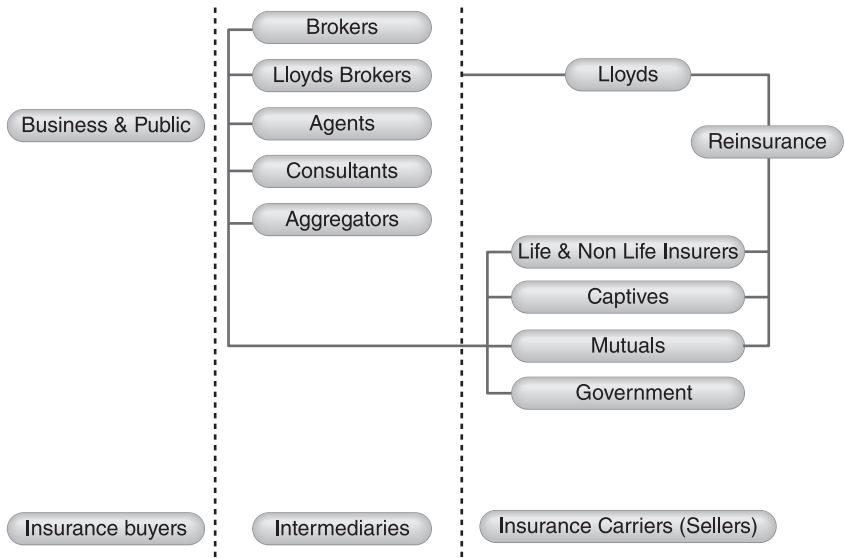


FIGURE 1.2 Relationships between parties

Even within single insurance organizations there are many functions and departments. Some operate as relative silos with little or no interference from their internal peers. Others such as Head Office functions like HR sit across the entirety of the business (Figure 1.3). All of these functions have the propensity for change, and at the heart of all these changes rests the topic of Big Data and Analytics.

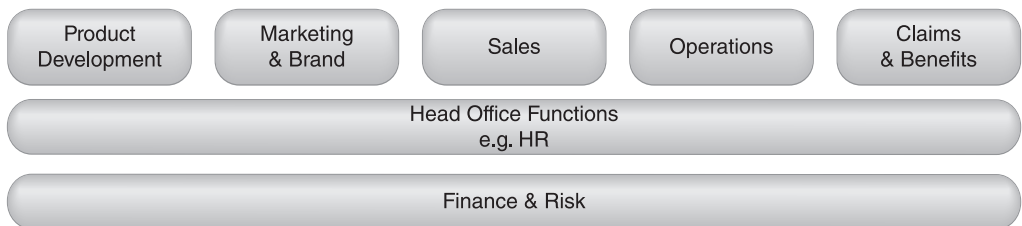


FIGURE 1.3 Insurance functions

1.1.1 Big Data Defined by Its Characteristics

Big Data may be ‘big news’ but it is not entirely ‘new news’. The rapid growth of information has been recognized for over 50 years although according to Gil Press who wrote about the history of Big Data in Forbes¹ the expression was first used in a white paper published in 2008.

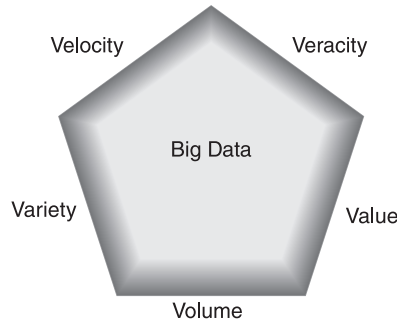


FIGURE 1.4 Big Data defined by its characteristics

With multiple definitions available, Big Data is best described by five key characteristics (Figure 1.4) which are:

- **Volume** – the sheer amount of structured and unstructured data that is available. There are differing opinions as to how much data is being created on a daily basis, usually measured in petabytes or gigabytes, one suggestion being that 2.5 billion gigabytes of information is created daily.² (A ‘byte’ is the smallest component of computer memory which represents a single letter or number. A petabyte is 10^{15} bytes. A ‘gigabyte’ is one-thousand million bytes or 10^{20} bytes.) But what does this mean? In 2010 the outgoing CEO of Google, Eric Schmidt, said that the same amount of information – 5 gigabytes – is created in 48 hours as had existed from ‘the birth of the world to 2003.’ For many it is easier to think in terms of numbers of filing cabinets and whether they might reach the moon or beyond but such comparisons are superfluous. Others suggest that it is the equivalent of the entire contents of the British Library being created *every day*.

It is also tempting to try and put this into an insurance context. In 2012 the UK insurance industry created almost 90 million policies, which conservatively equates to somewhere around 900 million pages of policy documentation. The 14m books (at say 300 pages apiece) in the British Library equate to about 4.2 billion pages or equivalent to around five years of annual UK policy documentation. In other words, it would take insurers five years to fill the equivalent of the British Library with policy documents (assuming they wanted to). But let’s not play games – it is sufficient to acknowledge that the amount of data and information now available to us is at an unprecedented level.

Perhaps because of the enormity of scale, we seek to define Big Data not just by its size but by its characteristics.

- **Velocity** – the speed at which the data comes to us, especially in terms of live streamed data. We also describe this as ‘data in motion’ as opposed to stable, structured data which might sit in a data warehouse (which is not, as some might think, a physical building, but rather a repository of information that is designed for query and analysis rather than for transaction processing).

‘Streamed data’ presents a good example of data in motion in that it comes to us through the internet by way of movies and TV. The speed is not one which is measured in linear terms but rather in bytes per second. It is governed not only by the ability of the

source of the data to transmit the information but the ability of the receiver to ‘absorb’ it. Increasingly the technical challenge is not so much that of creating appropriate bandwidth to support high speed transmittal but rather the ability of the system to manage the security of the information.

In an insurance context, perhaps the most obvious example is the whole issue of telematics information, which flows from mobile devices not only at the speed of technology but also at the speed of the vehicle (and driver) involved.

- **Variety** – Big data comes to the user from many sources and therefore in many forms – a combination of structured, semi-structured and unstructured. Semi-structured data presents problems as it is seldom consistent. Unstructured data (for example plain text or voice) has no structure whatsoever.

In recent years an increasing amount of data is unstructured, perhaps as much as 80%. It is suggested that the winners of the future will be those organizations which can obtain insight and therefore extract value from the unstructured information.

In an insurance context this might comprise data which is based on weather, location, sensors, and also structured data from within the insurer itself – all ‘mashed’ together to provide new and compelling insights. One of the clearer examples of this is in the case of catastrophe modeling where insurers have the potential capability to combine policy data, policyholder input (from social media), weather, voice analysis from contact centers, and perhaps other key data sources which all contribute to the equation.

- **Veracity** – This is normally taken to mean the reliability of the data. Not all data is equally reliable as it comes from different sources. One measure of veracity is the ‘signal to noise’ ratio which is an expression for the usefulness of information compared to false or irrelevant data. (The expression has its origin in the quality of a radio signal compared to the background noise.)

In an insurance context this may relate to the amount of ‘spam’ or off-topic posts on a social media site where an insurer is looking for insight into the customers’ reaction to a new media campaign.

As organizations become obsessed with data governance and integrity there is a risk that any data which is less than perfect is not reliable. This is not necessarily true. One major UK bank for example gives a weighting to the veracity, or ‘truthfulness’ of the data. It allows them to use imperfect information in their decisions. The reality is that even in daily life, decisions are made on the best information available to us even if not perfect and our subsequent actions are influenced accordingly.

- **Value** – the final characteristic and one not widely commented on is that of the value of the data. This can be measured in different ways: value to the user of the data in terms of giving deeper insight to a certain issue; or perhaps the cost of acquiring key data to give that information, for example the creditworthiness of a customer.

There is a risk in thinking that all essential information is out there ‘in the ether’ and it is simply a matter of finding it and creating a mechanism for absorption. It may well be that certain types of data are critical to particular insights, and there is a cost benefit case for actively seeking it.

In an insurance context, one example might be where remote aerial information obtained from either a satellite or unmanned aerial device (i.e., a drone) would help in determining the scale of a major loss and assist insurers in more accurately setting a financial reserve. Drones were used in the New Zealand earthquake of 2011 and currently US insurers are already investigating the use of this technology.

Beyond these five ‘V’s of data, it is likely that other forms of data and information will inevitably emerge. Perhaps future data analysis might even consider the use of ‘graphology’ – the study of people’s handwriting to establish character – as a useful source of information. Those who are perhaps slightly skeptical of this as a form of insight might reflect on the words of Confucius who about 500 BC warned ‘Beware of a man whose handwriting sways like a reed in the wind.’

Such thinking about graphology has become a recognized subject in many European countries and even today is used in some recruitment processes. Perhaps one day, the use of analytics will demonstrate a clearer correlation between handwriting, personality, speech and behavior. In an insurance context where on-line applications prevail, the use of handwriting is increasingly likely to be the exception and not the norm. Because of this the need for such correlation between handwriting and behavioral insight is probably unlikely to be very helpful to insurers in the short term.

1.1.2 The Hierarchy of Analytics, and How Value is Obtained from Data

Analytics, or the analysis of data, is generally recognized as the key by which data insights are obtained. Put another way, analytics unlocks the ‘value’ of the data.

There is a hierarchy of analytics (Figure 1.5).

- Analytics which serves simply to report on what has happened or what is happening which is generally known as descriptive analytics. In insurance, this might relate to the reporting of claims for a given date, for example.
- Analytics which seeks to predict on the balance of probabilities – what is likely to happen next, which we call ‘predictive analytics.’ An example of this is the projection of insurance sales and premium revenue, and in doing so allowing insurers to take a view as to what corrective campaign action might be needed.
- Analytics which not only anticipates what will happen next but what should be done about it. This is called ‘prescriptive analytics’ on the basis that it ‘prescribes’ (or suggests) a course of action. One example of this might be the activities happening within a contact center. Commonly also known as ‘next best action,’ perhaps this would be better

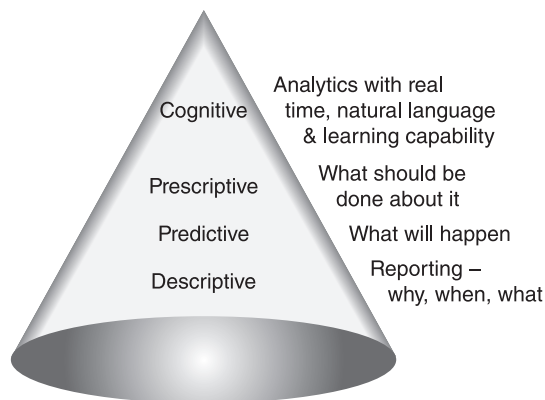


FIGURE 1.5 The hierarchy of analytics

expressed as ‘best next action,’ as it provides the contact center agent with insight to help them position the best next proposed offering to make to the customer to close the deal.

It need not unduly concern us that predictive and prescriptive are probabilistic in nature. The insurance industry is based on probability, not certainty, so to that extent insurers should feel entirely comfortable with that approach. One argument is that prediction is a statistical approach responding only to large numbers. This might suggest that these methods are more relevant to retail insurance (where larger numbers prevail) rather than specialty or commercial insurances which are more niche in nature. Increasingly the amount of data available to provide insight in niche areas is helping reassure sceptics who might previously have been uncertain.

In all these cases there is an increasing quality of visualization either in the form of dashboards, advanced graphics or some type of graphical mapping. Such visualizations are increasingly important as a tool to help users understand the data, but judgments based on the appearance of a dashboard are no substitute for the power of an analytical solution ‘below’ the dashboard. One analogy is that of an iceberg, with 80% of the volume of the iceberg being below the waterline. It is much the same with analytics: 80% or more of the true value of analytics is out of the sight of the user.

The same may be said of geospatial analytics – the analytics of place – which incorporates geocoding into the analytical data to give a sense of location in any decision. Increasingly geospatial analytics (the technical convergence of bi-directional GIS and analytics) has allowed geocoding of data to evolve from being an isolated set of technical tools or capabilities into becoming a serious contributor to the analysis and management of multiple industries and parts of society.

Overall it is important to emphasize that analytics is not the destination, but rather what is done with the analytics. Analysis provides a means to an end, contributing to a journey from the data to the provision of customer delight for example (Figure 1.6). The ultimate destination might equally be operational efficiency or better risk management. Insight provided should feed in to best practices, manual and automatic decisioning, and strategic and operational judgments. To that extent, the analytical process should not sit in isolation to the wider business but rather be an integral part of the organization, which we might call the ‘analytical enterprise.’

1.1.3 Next Generation Analytics

Next generation analytics is likely to be ‘cognitive’ in nature, not only providing probabilistic insight based on some degree of machine learning but also with a more natural human interface (as opposed to requiring machine coding). Cognitive analytics is not ‘artificial intelligence’ or ‘AI’ out of the mold of HAL in Kubrick’s ‘2001 – A Space Odyssey’ but rather represents a different relationship between the computer and the user. We are already on that journey as evidenced by Siri, Cortana and Watson. Speculators are already beginning to describe ‘cognitive’ analytics as ‘soft AI.’ This is a trend which is likely to continue as a panacea to the enormous volumes of data which appears to be growing exponentially and the need for enhanced computer assistance to help sort it. Cognitive analytics may also have a part to play in the insurance challenges of skill shortages and the so-called demographic explosion.

Forms of cognitive computing are already being used in healthcare and asset management and it is only a matter of time before it finds its way into mainstream insurance activities.



FIGURE 1.6 From 'data' to 'customer delight'

Coupled with this is the likely emergence of contextual analytics. Insurance organizations will become increasingly good at knowing and optimizing their own performance. Unless consideration is given to what is happening outside their own organization, for example amongst their competitors, then these viewpoints are being made in a vacuum. The American scientist Alan Kay expressed it succinctly in these words: 'Context is worth 80 IQ points.'

In the cold light of day, there are two key objectives which need to be adopted by insurers: Firstly, to outperform direct competitors, and secondly, to achieve strategic objectives. To do one and not the other is a job only partly completed. Often but not always the two key objectives go hand in hand.

Outperformance of competitors by insurers may be measured in varying forms:

- Finance performance – profit, revenue, profitable growth.
- Customers – retention, sentiment, propensity to buy more products.
- Service – both direct and through third parties such as loss adjusters who are considered, by extension, as part of the insurer themselves.
- Staff – retention, sentiment.

These issues need to be considered in the context of the wider environment, for example the macro-economy or the risk environment. In a time of austerity or where there is rapid growth in the cost of living, individual families may choose to spend more on food than on insurance products. At a time when the agenda of insurers has been dominated by risks associated with capital and solvency, perhaps their eyes have been temporarily taken off the ball

in terms of other risks such as underwriting risk, reputational risk and political risk but that position is relatively easily and quickly remedied.

1.1.4 Between the Data and the Analytics

Big Data in either its structured or unstructured forms does not naturally flow into analytic outcomes, which usually takes the form of reports, predictions or recommended actions, but relies on intermediate processes which exist ‘between the data and the analytics.’

How this is done in practice is a matter for the technical experts but in simple terms the raw data needs to be captured, then brought into the system where it is filtered, cleansed and usually stored. Massive volumes of data lend themselves to complex sorting systems or ‘landing zones,’ most of which have their own language and jargon. Often a datamart or staging layer is created to ensure that an analytical outcome can be created relatively quickly. The process by which data is moved through the system is referred to as ETL, or ‘extract, transfer, load.’

There are other alternatives, such as ‘data warehouse appliances’ which provide a parallel processing approach and create a modular, scalable, easy-to-manage database system. These high speed solutions allow very rapid computing power by providing an alternative to traditional linear processing, and often come with pre-bundled analytical and geospatial capabilities. In effect this is a ‘plug and play’ approach to Big Data and Analytics. These serve as a reminder that, as was experienced with the internet in the early days, both organizations and individuals will increasingly press for computing power in the form of analytics to be provided ‘at speed.’ It doesn’t seem that long ago that, in a domestic environment, connecting to the internet was accompanied by some form of whistling and other strange noises down the telephone line. Now instant 4G connectivity is expected anytime, anyplace, anywhere – within reason. Perhaps in that light, if one level of differentiation between technology vendors is that of the breadth and depth of analytical capability, the other differentiating factor may well be speed of delivery of the analytical insight. The need for speed potentially opens the door for interesting alliances of what might previously have been competing organizations.

‘Cloud’ computing also needs to be considered here. One good and simple description of cloud computing, often just referred to as simply ‘the cloud,’ is the delivery of on-demand computing resources. This includes everything from applications to data centers – on a pay-for-use basis, often accessible through wireless. For the record (and just in case anyone is thinking it) this is not a process in the sky or somewhere in the ether, but rather is an expression to reflect a capability. Users should not be misled by the fact that there are usually no cables or physical connectivity involved. As with the other processes described above, the technology is too complex to be considered in detail, and in fact cloud computing as a topic is worthy of its own book (and there have been many of them). But cloud computing also provides another example of how a paradigm shift in the thinking of the insurance industry needs to take place. The entire concept opens the door to new thinking, and those who do not have an open mind will be disadvantaged. In their 2014 document ‘Predicts 2015: Cloud Computing Goes Beyond IT into Digital Business’ Gartner indicate that business leaders will need to ‘constantly adapt their strategies to leverage increasing cloud capabilities.’

It is increasingly critical that business users need to have some understanding not only of current IT capabilities but what are likely to be the IT capabilities of the future, in order to effectively manage their business and create new and compelling strategies.

It is easy to get bogged down in terminology. Readers should try not to become either distracted or confused by many expressions which are not familiar to them. It may be sufficient for individuals simply to become aware of what they do *not* know, and as a result have an open mind about technology and change. Some may view this as a catalyst, a personal challenge or perhaps a call to action in order to find out about new elements of their own industry and other associated industries. Managers may wish to encourage their direct reports to become more familiar with technology as part of their annual personal development planning.

1.2 BIG DATA AND ANALYTICS FOR ALL INSURERS

At face value, Big Data and Analytics are for big insurers who have the economy of scale to supplement data external to their organization with a firm foundation of internal information. Many of the industry proof points, for example fraud analysis and telematics, are firmly aimed at the property and casualty market, and especially at the B2C sector. But insurance is a broad church, and there are many parts of the industry, perhaps all of them, that can benefit from an analytical approach.

1.2.1 Three Key Imperatives

At the highest level, all insurers are interested in three key elements

- Operational efficiency – delivered through cost reduction, claims management and productivity strategies.
- Profitable growth – delivered through profitable customer acquisition and retention, cross selling and upselling.
- Risk management – delivered through capital efficiency and operational risk management.

Underpinning these three elements is what might be described as a ‘pure play,’ that of financial performance management. It is called ‘pure’ because the analytical approaches used in the Office of Finance are generally transferable from industry to industry. All CFOs are interested in the financial performance of their organization and need to report to stockholders using standardized techniques. In the case of insurance CFOs, there is often less certainty in the figures which invariably make projections for ‘IBNR’ (Incurred But Not Reported), a situation where insurers need to take into account the amount owed by them to customers who are covered for a claim but have not yet reported it, such as in the case of a major weather event. The effect of long tail claims, i.e., claims of lengthy duration, is also an important part of the consideration of the insurance CFO and their team.

Increasingly insurers are gaining greater insight into the convergence of the risk, compliance and financial performance management process. This approach, where data is reused and where reporting software for instance is repurposed, allows insurers to gain added value from the compliance process. It also creates a soft benefit in that it starts to break down the silos of risk and finance that exist in many organizations and increasingly embeds a risk culture into operational decisions.

It is tempting to suggest what are the typical trends for any given segment of the insurance sector, but different trends occur within the industry, in different sectors at different times and in different places. A typical example of this might be the Solvency II initiative

in Europe, replicated to some degree in many other locations such as South Africa and parts of Latin America. While Solvency II has been a burning (and non-negotiable) platform, insurers had no real option but to pour in money and resource albeit to the detriment of other programs. For some insurers this represented 80% of their IT development budget. To that extent, risk and regulation have been at the top of the league table in terms of prioritization, although risk and compliance in Europe are increasingly assuming a ‘business as usual’ status. Although some fine tuning is likely to occur especially around risk reporting, the topic seems less critical at the moment. Even so, there is a school of thought which indicates that now that insurers have crossed the Solvency II compliance ‘deadline’ of January 2016, the topic of risk and compliance will be revisited as insurers drive for improved operational efficiency and cost reduction.

Standard techniques such as PEST and SWOT analysis remain available to insurers to allow them to identify key issues. Such a methodology remains valid although increasingly there is concern that some traditional management school thinking may be slowly becoming out of date due to the nature, impact and speed of change. In such formal techniques, topics such as disruptive technology may be both an opportunity *and* a threat. Beyond this, the influence of disruptive technology and ‘agile’ change is forcing organizations to re-evaluate their view towards risk management.

Notwithstanding, it is still possible to identify the key business drivers of each industry sector albeit that the prioritization of each business driver may differ at a local level, and these have been tabulated below.

Life and pensions insurance comprises the largest sector representing 60% globally and usually also at a local level (although there are some exceptions due to local economic considerations and market maturity). Life and pension companies have similar key drivers (Table 1.1).

TABLE 1.1 Key drivers of life and pension insurers

Business driver	External influences	Analytical response
Profitable growth	Market conditions and volatility	Asset and liability management
Risk management	Political, technological and economic uncertainty	Operational risk management
Customer behavior	Competitive environment, personal and corporate uncertainty, disposition to withdraw funds	Predictive behavioral analysis

Healthcare takes on different flavors geographically. Many insurers offer healthcare insurance cover, as well as travel accident insurance. That part of the insurance industry generally comprises two elements with similar business drivers (Table 1.2):

- Healthcare (wellness)
- Travel and Accident.

Property and casualty – often known as General Insurance – comprise 40% of the market, although this is also broken up into subsets such as retail (or personal lines), commercial lines, and specialty lines such as terrorism, marine, fine art and the like.

TABLE 1.2 Key drivers of healthcare insurers

Business driver	External influences	Analytical response
Rising cost of healthcare provision	Lifestyle and behavior, effectiveness and availability of state provision.	Effective underwriting
Increased claims cost	Rising cost of treatment	Effective triage, claims management, fraud analytics
Regulatory changes	Shift from public to private purse	Customer analytics, risk and operational management

Key business drivers (Table 1.3) are consistent to some degree although invariably differ dependent on the type of insurance business in operation:

- Retail
- Commercial Lines
- Specialty.

TABLE 1.3 Key drivers of general insurers

Business driver	External influences	Analytical response
Cost containment	Claims experience through weather volatility; too many frictional process costs	Effective claims management; effective customer onboarding; effective supply chain management
Fraud management	Economic environment, consumer behavior	Fraud management at point of claim and underwriting
Customer retention and growth	Overcapacity of local insurance marketplaces; retail insurance as a commodity; low consumer trust/loyalty	Customer analytics to understand and avert propensity to churn.
Regulatory compliance	Solvency and other local regimes	Capital and risk management

Reinsurers and Captives: Beyond these, there are reinsurance companies who underwrite the primary carriers or cedants, and captive insurers who act only for their commercial owners. Their key business drivers (Table 1.4) are less orientated towards issues

TABLE 1.4 Key drivers of reinsurers and captives

Business driver	External influences	Analytical response
Effective understanding of major incidents	Climate change, political volatility	Predictive modeling; what if modeling; understanding of risk accumulation through spatial analytics
Financial risk management	Economic and political volatility, risk accumulation	Capital and risk management

concerning the customer and more towards the management of financial performance and risk.

- Reinsurance
- Captives.

1.2.2 The Role of Intermediaries

Insurers do not operate in a vacuum but rather depend on third parties to help them discharge their obligations, or optimize their operations. If insurers have an interest in Big Data and Analytics, then so too must their intermediaries. Such ‘intermediaries’ include:

- **Tied Agents** – A company sales person who promotes the products of their employer only. Under section 39 of the Financial Services Markets Act 2000 (FSMA) they must make their status clear to the applicant/purchaser at the earliest opportunity.
- **Independent Agents** – Also known as an insurance sales agent or ‘producer,’ the independent agent usually sells a variety of insurance products and is paid a commission or remuneration. Usually the independent agent is an independent contractor, often with an individual business. National Alliance Research indicates that on average an independent (US) agent concurrently works with 13 property and casualty insurers, and six life insurers on a regular basis.
- **Loss Adjusters** – Independent or tied claims specialists whose duty is to administer a submitted claim within the terms and conditions of the policy. The expression ‘adjuster’ leads many to believe that the role of the professional involved is one of adjusting, or ‘reducing’ the claim as presented. Whilst that may be the case in some instances, the profession can trace its roots back to the late 17th century and since that time they have been variously known as ‘valuers,’ ‘surveyors,’ ‘assessors’ and more recently ‘adjusters’ – a term which seems to have become more commonplace in the mid-1950s.
- **Repairers, Body Shops and Restoration Contractors** – A broad group who are variously appointed either directly or indirectly by the insurer, or the policyholder in the event of a claim occurring. Their responsibility is to undertake the repair of either a property or vehicle to a prescribed required standard. This must be to the standard of the local building or construction regulation, or the required standards of the motor manufacturer. In the case of a restoration contractor, this function is usually initially to ‘stabilize’ the building following fire or flood prior to permanent works taking place. In some cases, the restoration contractor is able to undertake the permanent repairs.

These independent parties directly involved in the repair/fulfillment process came to the fore as a result of the desire of insurers to gain greater control over the repair process, usually in the light of claims costs increasing and also the impact of policyholder fraud. Historically the policyholder was invited to provide three estimates for a repair, and from time to time these were found to be provided by the same repairer albeit using different letterheads. (Astute claims handlers were usually able to identify spelling errors which were consistently made in each of the three estimates.)

In more recent times, as well as exercising better control over the process of repair, insurers have been able to secure cost discounts with these intermediaries based on volume and term agreements, e.g., two-year contracts or longer. In addition, this has also been presented

to the policyholder customer as an ‘added value’ attribute, removing the burden of concern away from their customer at the moment of distress.

As with all parts of insurance, the specific business drivers for intermediaries (Table 1.5) are complex and will depend heavily on the nature of the intermediary involved.

TABLE 1.5 Key drivers of intermediaries

Business driver	External influences	Analytical response by insurers
Customer retention	Customer behavior, reduced loyalty	Better insight into channel effectiveness
Continued profitability	Pressure on commissions	Agent optimization and management
Claims management	Customer pressure to obtain the ‘best deal’	Agent control, management and audit regime

1.2.3 Geographical Perspectives

Not all insurance markets are moving at the same speed nor have the same level of maturity. Insurance penetration and market maturity tend to go hand in hand. This can potentially be analyzed by type of insurance and by geography, and micro segmentation helps allow analysis by demographic group.

It generally follows that insurance penetration directly correlates to the level of maturity in the banking sector. For example, with the exception of South Africa, the level of insurance penetration in the African nations is very low. Notwithstanding, the emergence of micro-insurance (insurance products whose purpose is to be both affordable and provide protection for low income people – those living on \$1–\$4 per day) has the potential to ‘buck the trend.’ Also this is a historical perspective – the rate of growth in the telecom industry in Africa may open the door to new thinking driven by the convergence of mobile technology and financial services. One other model which is beginning to emerge is the convergence of insurance with other industries, e.g., retail, which may lead to an acceleration of insurance market penetration and growth.

For the purpose of this publication, only a limited number of territories have been considered:

- North America and Canada
- Western Europe
- China
- Latin America.

These four groups of countries represent approximately 90% of the insurance market as we currently know it. It is possible to identify some correlations between these territories, for example by contrasting growth markets with mature markets, but even these generalizations can be misleading as they can fail adequately to reflect the cultural and economic differences which prevail across vast regions.

1.2.4 Analytics and the Internet of Things

By 2020, everybody will have 5.1 connected devices, according to one management analyst and Gartner indicate that there will be 15 billion networked devices, many of which will be able to communicate with each other.

The concept of ‘Smart Devices’ isn’t new, in fact starting off 20 years ago. High tech manufacturers such as LG and Samsung already offer ‘internet-enabled refrigeration.’ It is already possible to control the central heating remotely, and turn the lights off and on (or even just dim them) using an android phone. The increased popularity of mobile devices such as ‘Fitbit’ and ‘Jawbone,’ amongst others, is leading fashion companies and watchmakers to consider embedding devices in attractive jewelry and timepieces. We are rapidly entering the period of the Internet of Things (‘IoT’) with significant future impact on the insurance industry.

What are the consequences for insurance and insurers? Can we see over the horizon something which we might call the ‘Insurance of Things’ and if so, what is this and what will be the consequences? There is no doubt that Big Data and Analytics will play a part in this new environment. Enormous amounts of data will be created, analyzed and interpreted.

The use of connected devices is not entirely new in the insurance industry. The initial focus seems to have been on personal lines but will the next big wave of innovation find itself in the commercial sector? Whilst much of the focus has been on personal vehicle telematics, this is readily extended to vehicle fleet insurances. Some insurers have already obtained indirect benefit from a broad range of technologies from RFID (‘Radio Frequency Identification’) tagging of container shipments to monitoring of supply chain conditions to ensure fresh produce.

The Internet of Things in an insurance capacity will be considered later but starts to open up interesting new areas. Naturally there will be issues of security, standardization and privacy all to contend with, but these are topics which go beyond insurance and rather affect the ‘new’ modern world as we (currently) know it. If insurance in the future will be increasingly dependent on data and devices, where will the burden of maintaining and future-proofing those devices rest? Will insurance start to consider the introduction of new conditions and warranties which are directly influenced by the new Big Data environment?

1.2.5 Scale Benefit – or Size Disadvantage?

Insurers are increasingly recognizing the value in their data but are often faced with the challenge of working out how to get started, how to find and gain access to the data they need, then to convert this into a useable form. Even before they start any analysis, they have major issues in setting up the organization, systems and software to be used. Part of the complexity is in respect of the skill sets needed to undertake this journey, ranging from systems management, data management, analytical capability and the ability to translate the data and eventual insight into a solution which is ‘consumable’ by the end user.

The increased change in mood towards more ‘agile’ organizations which undertake change through a series of ‘sprints’ rather than a consequential ‘waterfall approach’ may result in larger insurers having the same dynamic approach to change as that of the smaller company. On the other hand, perhaps smaller companies will want to adopt a more ‘risk-averse’ approach until such time as technologies are proven. Smaller insurers with more to lose might perhaps approach change with a ‘second mover advantage’ view of the world, adopting safe and incremental change which provides them with greater certainty

The effective implementation and adoption of data and analytics by insurers and intermediaries will almost certainly and eventually lead to transformation of the entire industry. The first question is not 'if,' but 'how quickly.' The second question is 'how'. Where will the change start?

The immediate thought is that change will occur initially within the larger organizations which have the funds and ambition to change. But larger firms are complex by their nature, have legacy issues to contend with, and may not have the nimbleness to change quickly albeit they may have the desire to do so.

On the other hand, smaller more agile firms with shorter chains of command may feel that the case for change is less clear, may be reluctant to incur expenditure, and simply may not know where to start their journey. These relatively smaller insurers, including specialist insurers, may also struggle to see the value of change. However, there are signs that even smaller insurers which embrace an analytical approach can grow rapidly. Specialty insurers can obtain greater insight into their existing book of business and become both more profitable and less vulnerable to volatile market conditions.

European insurance carriers will have already started their analytical journey, forced to take the first steps by regulators who have demanded that insurers improve the management of solvency. Effective management of the Solvency II program or local equivalent has resulted in insurers needing to address a large proportion of the structured data within their control, especially financial data. The timetable for Solvency II implementation may have slipped but larger 'Tier 1' insurers have got an early start in managing their wider data program. As a result, they may also have the time, skills and perhaps also the confidence to start looking at other data areas with greater purpose.

Another interesting conundrum emerges in that the effective management and analysis of data may start to have an equalizing effect, reducing the perceived differences between Tier 1 and other insurers. Larger insurers may become more 'agile' and mimic the smaller company. Smaller insurers may become cautious and keen only to adopt proven technologies which with time may have become less expensive in any event. Analytics in the virtual enterprise may also allow both larger and smaller insurers to become more confident in their outsourcing arrangements.

At its most basic, an insurance company simply comprises three elements:

1. Manufacturing of the insurance product – that is to say, underwriting, capital allocation and regulatory reporting
2. Distribution – the way that a product is brought to market, which may be directly or through a third party
3. Servicing – for example claims management and collection of premiums.

Two of these three elements need not sit within the insurer, but rather can be discharged through third parties and partnerships, leaving only the 'manufacturing' of the product to be undertaken. As insurers increasingly identify the value of integrating their own data with that of their supply chain, outsourced and third-party activities will have the opportunity to become more fully integrated. We will have entered the era of the virtual insurance enterprise.

Because of this new 'virtual enterprise,' fully supported by adequate data security and privacy, it is entirely feasible that Tier 2 and other insurers will be able to compete with and perhaps even outperform their larger competitors, not only as a result of more effective use of data and analytics but by virtue of their greater flexibility and nimbleness.

Intermediaries will also have a part to play in this story. They will also need to develop data and analytical capabilities just to stay in the game. Supply chain experts will demand these capabilities from their supply chain simply to allow them to stay in the procurement process. Through this change which is likely to be driven by the procurement process itself, the insurance industry is increasingly likely to see the emergence of the ‘super supplier.’

It follows that as procurement experts will be involved in the setting of the data and analytics requirements of their vendors, then the procurement professional will also need to have knowledge and insight into available analytical technologies. The supply management professional seems already to have many of the characteristics of an analytical professional especially in that part of the industry known as ‘category management.’ These particular experts use data and analytics in either spreadsheet or proprietary forms to understand vendor capacity, process and response times, costs and pricing and contingency management. These seem to be valuable analytical capabilities which may be of wider benefit to the insurance industry downstream as the analytical maturity of organizations increases. With an anticipated skill shortage of analysts predicted not just in insurance but across the wider business world, might supply chain professionals have a future part to play?

Taking all this into consideration, the insurance picture begins to transform. Existing business models start to be stretched into areas which a decade ago were probably inconceivable. The traditional value chain starts to break down, replaced by other perhaps loosely coupled contractual arrangements and now enabled by the new data and analytical technologies.

Future underwriting is also likely to be transformed. Both personal lines and commercial underwriters will have significantly more data and information on which to make more accurate decisions and more representative pricing. Better statistical models are also likely to emerge. Furthermore, there will be improved integration between analytics, GIS (location) and the use of more sensors. The development of the ‘semantic web’ – an expression coined by Tim Berners Lee, the father of the World Wide Web, to provide a way for it to operate in a more standardized way through common data formats and protocols – will provide the insurance industry with a common framework whereby data can be shared and reused across ‘applications.’ In doing so this is likely to increasingly break down enterprise and community boundaries. The consequence of all this will inevitably lead to the role of the insurance underwriter being transformed, as well as their working environment, skill set and almost certainly their career path.

1.3 HOW DO ANALYTICS ACTUALLY WORK?

It is in the nature of insurance people to want to know how things are done. They want to understand how business intelligence happens from a technological point of view, how predictive and prescriptive intelligence works and what really sits beneath the covers in cognitive analytics. That is not to say that they want to be able to do it themselves, but rather in understanding the basic mechanics they are able to recognize the key issues and also the limitations of the technology. It will also help them in terms of the implementation conversation.

Let us start by saying that this is not a simple matter nor was the concept of Big Data and Analytics invented overnight. Rather that the insurance industry finds itself in today’s analytical environment as a result of evolution, sometimes also an element of the step change and also from time to time, as a result of different thinking. In insurance which already has a legacy of analytical thinking as a necessary result of actuarial processes, new ideas increasingly

find their way into the industry from other sectors such as retail or telecom. The use of ‘Smart Meters’ and predictive maintenance of machinery is already present – but how can this thinking be adapted and extended to the insurance sector? What comprises innovation for the insurance sector may be relatively ‘old hat’ for other industries. For insurance practitioners, it is critical that they maintain a 360-degree view of all that is happening in the wider world of analytics to be able to take full advantage of the opportunities before them, and then to be able to take that thinking and apply it to their own industry.

1.3.1 Business Intelligence

The starting point of any discussion regarding business intelligence arguably goes back to the concept of measurement and control. Without measurement there can be no control, and without control there can be no improvement. Such straightforward thinking found its way into the challenges of industrial productivity of the automotive and other manufacturing lines of the 1920s and later, and was subject to continuous refinement both in process and methodology. As organizations drove for increased profitability, the management of activity and its translation into activity-based costing (which identifies activities within a process and assigns cost to each activity) started to dominate, and up to the present day still heavily influence our thinking. Cynics reasonably argue that cost rather than value is being measured, and that the measurement process drives a quantitative rather than qualitative agenda.

But regardless, the essence is that measurement of operational activity in the form of performance metrics became prevalent and to a great degree remains so. What organizations have come to realize is that the metrics which drive performance improvement also drive changes in behavior, and that these changes are not always beneficial. Individuals measured against performance metrics often seek ways of manipulating data to show themselves in the most positive possible light, for example, in the case of sales progression. The psychological linkage between performance management and individual behavior cannot and should not be underestimated. To counter this, some organizations are also building behavioral traits into the assessment process, although like ‘soft benefits’ these behavioral traits may struggle to avoid a degree of subjectivity.

The topic of ‘conduct risk,’ that is, how we manage the performance and behavior of our sales people for example, becomes increasingly important especially in the shadow of Dodd-Frank and other consumer-orientated legislation. Analytical capability can sit behind the sales process not only in terms of sales performance management but also in the way that sales are conducted. If performance metrics drive behaviors (as might remuneration packages of sales staff) then analytics can be used as part of the solution in ensuring sensible behavior.

In essence, information collected can be assembled and structured to create management information. Historically this has been through tabulation but increasingly has been managed through spreadsheets. Information from outside the immediate organization, for example from the supply chain, can be obtained by ‘enforcing’ the supplier to provide information in a prescribed format as part of the supplier contract, so that information from many suppliers can be merged and consolidated to give a view of the broader environment. In other words, the procurement process can form one of the tools whereby suppliers provide information in a consistent way allowing the insurer to gain greater insight into multiple factors, such as cost, value and customer satisfaction drivers.

By collating this information from many suppliers as part of an RFI (‘Request for Information’) or ongoing process, insurers and others may find themselves with a clearer view of

particular parts of the industry than some of the so-called expert vendors themselves. The challenge for such insurers is to recognize that knowledge in such circumstances *is* power, especially in a vendor negotiation process. Procurement professionals have recognized this for some time and use it ruthlessly in the negotiation process.

For many insurers, a spreadsheet approach to management information remains a critical capability but even spreadsheets have evolved. Those who were once experts by being adept at creating a pivot table now find themselves needing to be conversant with the advanced capabilities of spreadsheets with better visualizations and analytical capability. Spreadsheets, like the whole topic of analytics, continue to evolve and allow the user to have greater insight and improved visualization. The challenge for users of spreadsheets is most probably not only that of data capacity but also the increasing complexity of the business operation and its interdependencies. If it is argued that the insurance business is too complex to be managed either by intuition or experience (or both), then we are increasingly reaching the tipping point (if we have not reached it already) that it is also too complex to be managed by spreadsheet especially in the larger organizations.

Business intelligence is more than a form of enhanced management information. Rather it is a fundamental tool which allows insurers to understand if they are on track to meet their strategic objectives and where appropriate provide early warning signals that corrective action needs to be taken. If the sole purpose of executives is to ensure that the strategy of the organization is achieved, then it is critical that they have access to information which tells them, in indisputable ways, that the organizational ambition is on track or whether corrective action is needed. It follows that the metrics of business intelligence should align themselves to the strategic objectives of the insurance organization. There is no point in measuring things which are irrelevant to the strategy of the insurer.

The mood is increasingly for relevant information to be placed in the hands of the decision-maker, from a common source, so that, regardless of personal interpretation, there can be no doubt as to the source of the information and its veracity. This is often described as a ‘single version of the truth.’ To do this requires an information infrastructure which places data at the heart of the organization, centrally stored and accessible but with access appropriate to need and clearances. Many if not all business intelligence systems provide such capability which has become in effect a hygiene factor in creating a BI or ‘Business Intelligence’ solution.

The concept of a ‘single version of the truth’ lends itself to a data warehouse where information is held for the common benefit and is accessible accordingly. Such warehouses are usually in the form of an OLAP ‘cube’ of inter-related or ‘relational’ data and in most cases form the foundation of a business intelligence strategy for the insurance organization. (‘OLAP’ is an acronym for ‘Online Analytical Processing.’) Think of this as data held in a form of ‘Rubik’s Cube’ rather than held in a flat form, and allowing the user (with appropriate access) to cut and slice the data according to their needs. In some cases, the data may be so large as to require the need for an intermediate data warehouse, or ‘datamart,’ so that the most important data allows more rapid interrogation.

Such an approach also demands a change in the function of the IT department who are also transforming from being the gatekeepers of the organization to the facilitators of information. They have a role in terms of the integration of systems and capabilities but as the demand for information increases it is critical that the IT department are seen as the ‘key enablers’ rather than any form of bottleneck. The days of waiting for reports from the IT department are rapidly disappearing. The most insightful organizations are transforming the

function of the IT department into a role which fully supports the business – perhaps something they themselves have always aspired to be. The change is as much around culture and capability as it is around attitude.

Such an approach requires the IT department to be much more aligned with the business issues of the organization as with the technological requirements. It requires technology experts to sit with line of business decision-makers to understand their issues and to consider how technology can help an insurer reduce cost, improve profitability and reduce risk. It is a conversation about business issues converged with technology rather than forcing new technologies into business scenarios. Technologists increasingly need to understand that in the future (perhaps current) world of insurance, business and technology need to work absolutely hand in hand.

At its core are issues of leadership as well as technical capability, although it has to be said that analytics is advancing so quickly that no-one can afford to be complacent. Effective IT leadership demands organizational empathy and not isolation. Both business and technology leaders must understand and essentially be able to communicate the changes happening in the commercial environment, what has to be done to react to them and to anticipate likely changes. To do so specifically requires technology leaders to use language familiar to the line of business and not to hide behind IT jargon. Equally technology leaders need to be familiar with the terms of business users and understand the key business drivers that sit behind these terms. Maybe IT within the insurance organizations is finally coming of age.

How professional organizations also react is a matter of considerable interest. Insurance institutes often still see IT as a different profession, and IT institutes see insurance as simply an application of some of their technology. This attitude will not suffice in the new era of digital insurance. Convergence of professions will inevitably occur, most likely through subgroups within established professional organizations. Will individuals personally choose to join the technology subgroup of the insurance institute, or the insurance subgroup of a computer institute? Aren't both trying to achieve the same aims, and aren't they two sides of the same coin?

Business Intelligence is often seen and described as being one step beyond 'management information' or 'MI,' at least in aspiration and delivery (usually through mobile devices rather than paper driven). It is more than this, it is an essential tool related to strategic delivery as opposed to just sitting in isolation as some form of output from a set of performance metrics. But what next? The rather more complex issue of prediction is the next area that needs to be addressed and considered.

1.3.2 Predictive Analytics

If the future could be predicted with certainty, then some of us would definitely be richer men and women. Realistically it needs to be accepted that prediction and hence predictive analytics is not a precise science. Insurers need to be comfortable with that notion and realistic about what can be achieved. Insurance has never been about certainty but rather probability. The insurance industry has always used probability in the form of statistics to help understand the propensity of an individual to live to a particular age, a driver to have an accident in their car, or a property to flood, burn to the ground or to subside.

However, as predictive analysis is considered in the context of insurance, it is helpful to have an appreciation of the tools of the trade. These help practitioners also gain insight into whether a customer will leave or stay, buy more, or have a propensity to be fraudulent at the point of claim.

Although many seek to explain predictive analytics in terms of data and algorithms, perhaps a different (and more helpful) place to commence is in the realms of personal intuition. Individuals carry out personal predictions thousands of times every day without the aid of technology. This is variously described as intuition or judgment, but in reality they both have the same source in that decisions are made based on what is known, what has been past experience and what is likely to happen. In the days before technology, the claims manager or adjuster might ‘smell a rat’ in that the story given by the policyholder by way of explanation might not fit with the physical circumstances. Or perhaps a bodyshop inspector has heard anecdotally about a particular repairer and there are inconsistencies with invoices as submitted from that supplier. Individuals usually place certain weighting against particular facts, and some are more important than others. From time to time, it is discovered, often with the benefit of hindsight, that certain factors proved to be more important than had initially been thought to be the case, and this modifies the consideration given to a similar situation next time. The starting point is one of experience and from there greater insight into the future can be obtained.

With predictive analytics, the starting point is much the same, except that ‘experience’ is replaced by information normally in the form of data. ‘Intuition’ is replaced by algorithms or mathematical formulae based on interpretation of factual information. To make predictions about which customers are likely to be fraudulent at point of claim needs good data about fraud behaviors in the past. This may extend to the typical types of claims most likely to give rise to fraud. What types of customers are most likely to be fraudulent by nature, where do they live, what is their profession? What is the time interval between the inception of the policy or its cancellation, and the date of the claim occurring? These data points and others help to provide a picture of the likelihood of a fraud having being committed but there is no absolute certainty of fraud (unless of course there is physical evidence such as a fraudulent invoice or a witness statement, perhaps).

A similar situation may arise in respect of customer loyalty. Having information or ‘data’ which helps an insurer gain insight into buying behaviors, which may be a factor of age, gender, location, or channel will also give an insight into the likelihood of policy renewal. This data may not solely exist within the insurer but could potentially be found from other sources such as the individual’s behavior in other industries such as telecom or utilities.

The opportunity to integrate fraud insight and customer insight becomes increasingly compelling when the data points are combined, potentially giving an insurer a 360-degree viewpoint of their customer. It not only helps insurers to understand their potential customer’s propensity for particular behavior but also allows the insurer to decide whether a customer is commercially desirable (i.e., profitable or influential), or not.

Looking more specifically to the statistical element of predictive analytics, the analyst, often in tandem with the experienced line of business executive, is able to identify that particular factors are associated with a particular outcome. A tool called ‘regression analysis’ is used to gain better understanding as to the importance of this association. ‘Regression analysis’ is the primary tool used by analysts in this research. It is a statistical tool showing the correlation between the input and the outcome. This is not a new concept, in fact the first regression analysis in the form of a linear analysis (or a best fit line between the data points) goes back to 1805 and sought to explain the movement of planets around the Sun.

Not all relationships are as simple as a straight line. More complex scenarios require the data to be fitted against a curve rather than a straight line. Not surprisingly this regression analysis is known as ‘curve fitting.’ There are different approaches to the use of ‘curve

fitting’ – it can either be an exact curve aligned to the data points, or a smoothed curve. A process called ‘statistical inference’ allows users to understand the degree of inaccuracy in the curve which helps provide the level of confidence in the predicted output. Ultimately this leads to the creation of a regress equation, regression coefficients, and ultimately a score predicting the likelihood of any particular event or behavior occurring.

The scoring element may have the tendency to change with time due to economic conditions, market changes and even for example in the case of a major weather incident. It becomes important therefore to consider the predictive ‘models’ as live entities, continually being refreshed and with actual outcome measured against predicted outcome.

Many statisticians find their way into the world of analytics and naturally will bring with them their numerate skills and experience. They also have a personal challenge in so far as they need to understand or at least be aware of the advanced technical analytics which increasingly support their numerical acumen. More importantly they also have to understand the business issues which their statistical insights ultimately need to directly and indirectly support.

1.3.3 Prescriptive Analytics

As a concept, prescriptive analytics comes in for some slight criticism in that it is viewed at best as an intermediary between predictive analytics and cognitive analytics. It is understood as an extension of predictive analytics which incorporates a degree of machine learning. In many ways it is the precursor to ‘cognitive analytics’ discussed later.

Prescriptive analytics is a concept introduced by IBM around 2003, and extended and copyrighted by Ayata who are a US-based software consultancy who describe themselves as having ‘invented prescriptive analytics.’ As an idea prescriptive analytics talks not only to the idea of anticipating what will happen – prediction – but more importantly what should be done to benefit from the predictions. Ayata describe ‘prescriptive’ as ‘a series of time dependent actions to improve future outcomes.’ It considers for example what might be the buying propensity of a prospective policyholder and what offer is most likely to be accepted, and in the event of rejection, what is the fall-back offer to be made. By its nature, prescriptive analytics is dynamic, subject to continuous learning and helps organizations optimize the predicted future.

Prescriptive analytics is similar to any other form of analytics in so far as it does not represent the destination but rather is a means to an end. The dominant purpose of all analytics is to change process, inform best practice and (in the most commercial of applications) improve sales or operational performance. The fact that there is no precise separation in the definition between prescriptive and predictive analytics should not be the source of any angst. It is merely a reflection of the growing maturity of the analytical journey. Innovation often occurs incrementally rather than in step changes – although step changes can occur in terms of new sources of information and interpretation such as in the case of the IBM and Twitter partnership in 2014.

Prescriptive analytics by its nature incorporates both new and associated technologies into the analytical recipe such as:

- Machine learning
- Natural language processing
- Applied statistics

- Signal processing
- Image processing
- Metaheuristics.

Insurance experts considering analytics need not necessarily consider the detail of any or all of these capabilities. Perhaps in time the most important of all these may be thought to be ‘machine learning.’ This has a slightly threatening implication – but insurers need to consider that technology, through the use of precise technical capabilities, as an enabler rather than a threat. However, the concept of ‘machine learning’ will sound slightly ominous to some.

These are discussions and conversations for a future generation of insurance professionals. What we can be sure of is that as technology develops, then so will the financial services sector and insurance specifically. Analytics has been previously considered in the context of insurance. Perhaps a better (or at least different) question to consider is the future of insurance in the context of analytics. Instead of viewing analytics as a tool to meet traditional insurance needs, perhaps insurance will be transformed by the advances of data and analytics. Actually, there is no question here – insurance will be transformed and perhaps the main issue is to what degree.

1.3.4 Cognitive Computing

For some professionals, the expression ‘cognitive computing’ has the potential to create nervousness and concern. But technology organizations are keen to downplay the concept that this is a form of artificial intelligence, but rather the next phase of analytics which improves the integration of technology and business (and all) decisions. The reader should not be shocked by this development. Most cars for example tell the driver when a service is needed based on mileage or duration. It is not beyond the scope of current technology even today for the ‘car’ not only to identify that there is a need for an oil change, but conceptually (in newer models) to even make the garage appointment, ratifying the date with the driver and entering it automatically into their diary.

Cognitive computing is complex. It is dependent not on one technology but rather on many. Multiple APIs or ‘Application Programming Interfaces’ form part of the overall solution. At the most basic of definitions, these comprise a series of technical processes, protocols and tools which allow and create capabilities such as speech recognition. APIs are a form of ‘software to software’ capability allowing different parts of the ‘system’ to talk to each other without human intervention. If that sounds rather scary, many of these technologies are already in place and you already use them when booking a cinema ticket on-line. As a user, you only see one element – the ticket portal – but so much is happening behind the scenes. And this is the case with cognitive analytics. The user may ask a question ‘in natural language’ but the answer is generated in a complex and technologically driven way. When we book the cinema ticket, technology is taken for granted. What might be the equivalent in the insurance profession?

One of the great challenges of cognitive computing is that for individuals it is viewed with a legacy perspective. There are plenty of examples of our viewing the world through our own personal legacy lens. In fact, in many cases there is no option but to do so. One of the big challenges for the insurance industry (and maybe all industries) is that there is no precedent to follow or to base our opinions or decisions on. Imagine the conversation about the potential of electricity in a world of steam.

The insurance industry needs to be realistic about this. In many parts of business, indeed in many parts of life, decisioning has already been subsumed to the machine or system. As we mentioned earlier, your car may already tell you when it needs a service. The information on the auto dashboard nowadays tells us the level of oil in the engine when, a decade ago, the driver would rely on the dipstick. At what point will the car itself refuse to move in order to ‘protect itself’? Are the days of turning the radio louder in a company car when there is a strange noise from the engine completely gone? In the transitional period there are enough individuals with experience to ask appropriate questions if there are doubts regarding the insights provided by the analysis, but as this particular demographic passes into retirement, how much legacy knowledge and experience will be lost to the insurance industry? Perhaps one option is that retirement will not occur overnight, but rather some insurance experts will remain in semi-retirement to guide the industry. The danger is of course whether those offering advice from retirement will be like the legacy generals of the First World War in Europe, suggesting that mounted cavalry in the face of machine guns is still a good thing provided that the cavalry charge is implemented properly.

Perhaps the industry adoption of cognitive analytics, taking all the current tools and invariably future tools and data sets as well, is not so much a technology issue but rather a cultural issue. It is about how the insurance professional relates and interacts with technology, and perhaps even exploits it rather than becoming a victim of it. It might even be necessary to think of technology in a different way. As technology pervades every part of our life and increasingly affects our business decisions, it starts to become ‘the way things happen around here’ rather than some form of additional electronic or technical capability reinforcing old methods.

In conclusion, the essence of this particular sector is to understand ‘how it happens,’ or ‘how it works.’ In summary, perhaps analytics works through a combination of three elements, recognizing that:

- Increasingly advancing technology is irresistible.
- Changing culture is inevitable, including our personal and corporate relationship with the computer.
- Leadership is critical, which includes having a vision for the future in terms of using these capabilities to transform industries and organizations.

These are not unexpected attributes – but continue to remind us of the complexity of this particular change. Analytical transformation is not solely a technology issue for insurers but in addition there are other important cultural and personal aspects to bear in mind.

NOTES

1. Press, Gil. ‘A Very Short History of Big Data.’ *Forbes Magazine*, 2013. <http://www.forbes.com/sites/gilpress/2013/05/09/a-very-short-history-of-big-data/> (accessed May 17, 2016).
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