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Life insurance in the digital age: fundamental transformation ahead

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Executive summary

New data and technologies can radically transform the way life insurance is underwritten and sold.

Technological advances have the potential to radically change the way life insurers interact with consumers and also help them better assess and price risks. The rapid spread of internet-enabled wearable devices and ubiquitous connectivity are enabling new ways of communication and information sharing. The amount of digital data generated automatically, inexpensively and non-intrusively is growing exponentially. The number of tools to analyse the data and extract useful insights on consumers is also growing rapidly. Developments in artificial intelligence and cognitive systems also create opportunities for innovation. And advances in medical technology have the potential to improve health outcomes and extend lives, thus changing risk pools.

For underwriting, there is potential to reduce the length and invasiveness of risk assessment, improve risk selection and refine policy pricing.

In underwriting, new data sources and innovative platforms to store and mine data or simply automate existing processes can reduce the length and invasiveness of risk assessment, improve risk selection and refine policy pricing. Automation of underwriting – a growing trend – will be pushed to new frontiers by developments in cognitive computing, while Big Data and new analytical tools will progress the still-nascent stage use of predictive underwriting in life insurance. Data sharing platforms for end consumers will reduce the cost of collecting health information and provide a more complete view of customers for more accurate risk assessment and pricing.

New technologies can also facilitate improvements in distribution through stronger consumer engagement.

In distribution, the importance of new channels facilitated by the internet, smartphones and social media is increasing. New technologies can enhance consumer engagement with life insurance by making the application process easier and by using rewards programmes and techniques such as gamification. New sources of data and predictive modelling tools offer opportunities for more granular client segmentation and better identification of clients' needs. In addition to better targeting the existing customer base, new technologies also offer the potential to reach new customer segments.

Life insurance has lagged behind consumer expectations in the digital age.

Digitalisation and the spread of the internet and mobile technology have transformed a number of industries. Life insurers, however, have been slow adopters of the innovations that technology advances offer, with changes happening only gradually. The sector lags behind other industries in offering consumers a positive online experience and meeting customer expectations in the digital age.

Insurers will need to review their investments in technology, rethink talent strategy and adapt their business models.

Technology and the digital data revolution will fundamentally change the business of insurance. To grow their business, insurers will need to review their investments in technology, rethink talent strategy and adapt their business models. Some life insurers are partnering with start-ups to build their own data analytics capabilities. Technological developments could spur new operating models for existing insurers, allowing them to become purely digital and to provide new services beyond traditional insurance.

Technology presents new challenges for life insurers also.

New technology presents opportunities, but also gives rise to new challenges that life insurers need to address. One is regulation, with lack of clarity and consistency around data protection and privacy. There are also regulatory challenges with respect to the use of digital technology in cross-border selling. Further, life insurers will not want to alienate consumers through their use of technology and data analytics. Finally, non-traditional players are entering the market, presenting an opportunity for partnership. However, they could also eventually compete with traditional insurers.

Introduction

Digital technology has already transformed many industries ...

... but the revolution has been slow to take off in insurance.

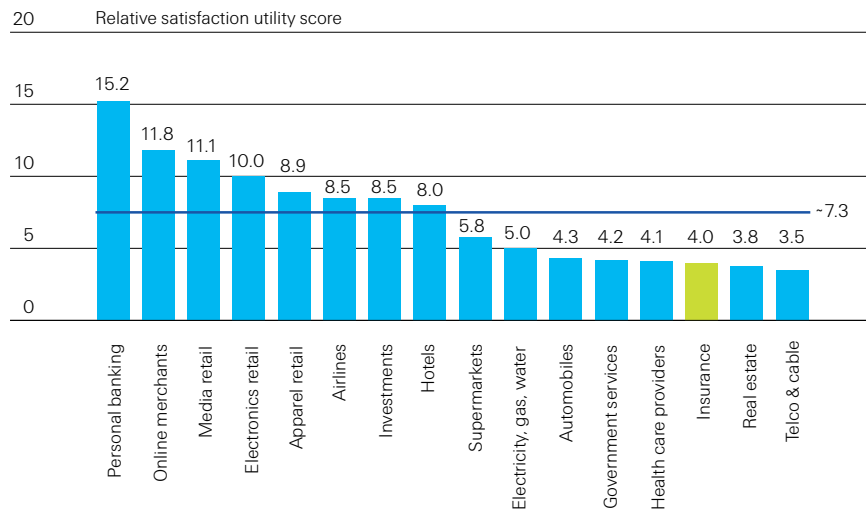
The industry also lags when it comes to offering consumers a positive online experience.

Digitalisation and the spread of the internet and mobile technology have impacted a number of industries in recent years, transforming them beyond recognition. Sectors with low barriers to entry, generic products and low marginal costs such as the music, publishing, retail and travel industries, have been most affected. Digital technology is now revolutionising industries with more complex production processes and higher barriers to entry also. In the financial services, for example, innovation is driving disruption in payment systems, consumer lending and wealth management, among others, leading to improved functionality and lower costs.

The insurance industry has been slow to adopt some of the innovations that digital technology offers. There has been gradual acceptance of certain aspects such as digital distribution over the past decade but change, especially in the life sector, has been at the margins only.¹ Customer-centricity is not yet the norm in life insurance: a “one-size-fits-all” approach and a focus on agents rather than consumers is still widespread, limiting consumer choice and product customisation. Moreover, a lengthy and convoluted buying process often leaves consumers confused and lacking trust in insurance providers.²

Yet consumer preferences and buying behaviours are changing rapidly, not least because many industries have already adopted more customer-centric and technology-inspired business models. The younger generation (Generation Y, born between the early 1980s and late 1990s, and subsequent generations) in particular have grown to expect easy and quick access to information in commercial interactions, transparency about cost and value, and high-quality service. Not surprisingly, consumer surveys show insurance lagging behind most other industries when it comes to customer satisfaction from online experiences (see Figure 1).

Figure 1
Consumer satisfaction with online experience, by industry



Source: *Delivering Digital Satisfaction* ©2013, The Boston Consulting Group (BCG)

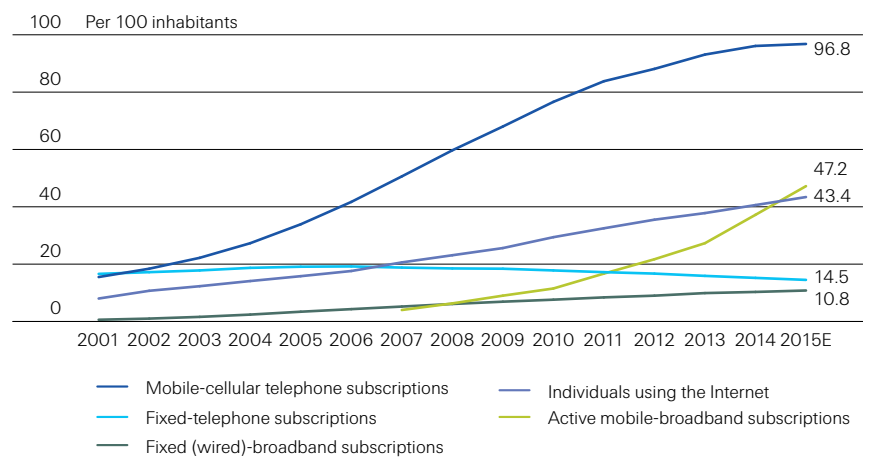
¹ *sigma* 2/2014: Digital distribution in insurance: a quiet revolution, Swiss Re.

² *sigma* 6/2013: Life insurance: focusing on the consumer, Swiss Re.

However, the life insurance sector is set to undergo fundamental change, driven by technology.

The digital universe and technological advances have the potential to radically change the way in which life insurers interact with consumers, and also help them better assess and price risks. Their rapid spread is a disruptive force, enabling new interfaces and formats for communication, sharing of information and interacting with the physical world (see Figure 2). Abundance of data on consumers and new ways to evaluate it create opportunities to innovate in underwriting and distribution. In the emerging markets, mobile technology allows for connecting with billions of people: in many, communication systems have jumped from there being virtually no connectivity direct to the mobile and even smart phone age. Advances in artificial intelligence (AI) and new analytical tools are making it possible to augment or automate certain aspects of the work of insurance professionals. Also, advances in medical technology have great potential to facilitate early diagnostics and prevention of disease, improve the health of people with chronic diseases, and extend lives.

Figure 2
Global growth in technology and connectivity, 2001–2015E



E = estimates.
Source: ITU World Telecommunication/ICT Indicators database

This *sigma* assesses the implications of new technologies for life insurers.

Some life insurers have used digital communications to offer insurance that had been unaffordable or unavailable previously. The use of real-time data is enabling companies to streamline the underwriting process and reduce reliance on invasive testing such as blood samples. Other insurers are taking action to capitalise on the opportunities that new technologies can provide in the future by forming partnerships with tech start-ups as a means to build their own Big Data capabilities. There is an awful lot more that can, and will, happen. This *sigma* edition provides an overview of key technological developments relevant to the life insurance industry. It discusses the potential impact of these developments on underwriting and distribution, and assesses the longer-term opportunities, risks and challenges that new technology and data analytics present to life insurers.

Key technology developments impacting life insurers

New technologies to transform the industry.

A wide range of technological changes will affect the future of the insurance industry. These developments include data and analytics, artificial intelligence and cognitive computing, new medical technologies, wearable devices and digital health, and the Internet of Things.

The amount of information generated through various devices is set to roughly double each year.

Data and analytics

The amount of data generated in the world today is increasing exponentially as the range of devices capable of sending and receiving data over the internet – computers, tablets and mobile phones and their applications (“apps”), cameras, embedded sensors and others – continues to expand. According to IDC’s Digital Universe Study, from 2013 to 2020 the digital universe will grow by a factor of 10 – from 4.4 trillion gigabytes to 44 trillion – roughly doubling every two years.³

Digital data can be a competitive advantage in business but currently, much of the information generated is not useful.

A large share of the digital data is generated automatically, inexpensively and non-intrusively by devices capable of sending and receiving information, and from transaction records, social media platforms and web logs. Much is unstructured, collected in real time, updated frequently, variable and not always useful. For example, the IDC study said that in 2013, only 22% of the digital data bits generated would have provided value if tagged and analysed.⁴ Two-thirds of the data were generated by use of devices by consumers and workers, but enterprises had liability or responsibility for 85% of that.⁵ Of the data generated in 2013, only 5% was actually analysed, according to the IDC. It is a widely-held belief that the competitive advantage in business will go to those firms able to use Big Data and predictive analytics to identify consumer preference trends early, to gain insights into consumer preferences and make operations more efficient.

That’s why many firms are hiring data scientists with the ability to extract useful insights from large volumes of digital information.

However, the ability to gain useful insights from the ever-increasing amounts of data is challenging. Big Data broadly refers to data sets so large or complex that it is critical to have the right tools and techniques to manage and analyse them effectively.⁶ As data variety and diversity push the limits of technological innovation, new data management techniques and frameworks are being developed. This discipline is called “data science”, loosely defined as the extraction of knowledge from large volumes of structured and unstructured data. Many firms recognise the strategic importance of Big Data analytics and are building large teams of data scientists.⁷

³ In the report, the estimates consider data generated by more than 40 types of devices including radio-frequency identification devices (RFID), sensors, supercomputers, supercolliders, PCs, servers, cars and planes. See *The Digital Universe of Opportunities: Rich Data and the Increasing Value of the Internet of Things*, White Paper, IDC (sponsored by EMC Corporation), April 2014.

⁴ By 2020, it is thought that the useful percentage could grow to more than 35%, mostly because of the growth of data from systems embedded in computers and small devices.

⁵ For example, Facebook’s users had uploaded more than 250 billion photos on its website by 2013, and an additional 350 million new photos were being uploaded each day. See “A Focus on Efficiency - A White Paper from Facebook, Ericsson and Qualcomm”, *internet.org*, 16 September 2013, http://www.meducationalliance.org/sites/default/files/internet.org_-_a_focus_on_efficiency.pdf

⁶ There is no one definition of the term Big Data. For an overview of definitions, see J. S. Ward and A. Barker, *Undefined by Data: A Survey of Big Data Definitions*, School of Computer Science, University of St. Andrews, 20 September 2013.

⁷ T. H. Davenport and D.J. Patil, “Data Scientist: The Sexiest Job of the 21st Century”, *Harvard Business Review*, October 2012.

Data science is an interdisciplinary field focused on extracting knowledge from data.

The process involves multiple steps, including data collection and cleaning, ...

... modelling, reporting and visualization of results to support business decision-making.

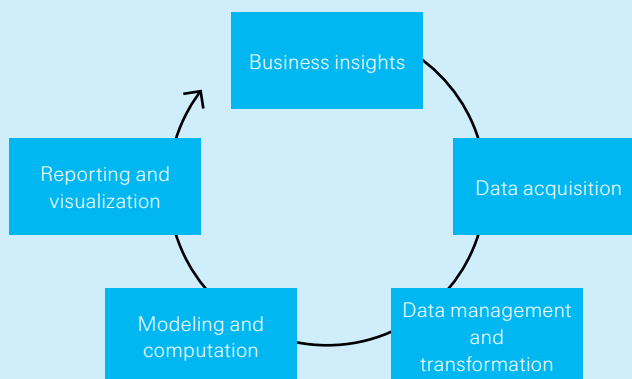
What is data science?

Data science is an interdisciplinary field incorporating computer science, modelling, statistics, business analytics and mathematics to analyse massive amounts of data to extract insights and knowledge.⁸ In addition to technical skills, data scientists must have sufficient expertise to formulate the questions to be asked of the data and to interpret the results.

The process is circular, starting with obtaining a sufficient amount of data from multiple sources, the nature of data being searched for itself determined by existing business insights and objectives. The data then needs to be cleaned and put into usable format. This is especially challenging for unstructured data (eg, data from Twitter) due to its complexity and non-representativeness.

The modelling stage, which can involve statistical analysis, data mining and machine learning⁹, comes next. The choice of analysis technique depends on the nature of the end goal, for instance whether the aim is to explain causal relationships or to predict. Exploratory data analysis often uses statistical tools to fit the model and investigate causality relationships. Predictive models, on the other hand, use machine learning algorithms and data mining tools that automatically search through the data and learn how to recognise patterns and discover useful relationships. These are used to train the model and improve its ability to make predictions. In the final stage, the results from the data analysis are interpreted, visualised and reported so as to be useful for business decision-making purposes. These insights are also used to inform the focus of data searches for subsequent business initiatives.

Figure 3
The data science process



Source: Swiss Re Economic Research & Consulting (adapted from various sources).

Only a relatively few companies from all industries have successfully deployed Big Data applications.

To date, the number of firms across all sectors actually deploying solutions derived from Big Data technologies are relatively few. According to a survey by Gartner, the share of companies that invested or planned to invest in Big Data in the next 24 months grew to 73% in 2014, from 64% in 2013. However, only 13% of those have actually deployed applications and solutions, with much of the work revolving around strategy development, the creation of pilots and experimental projects.¹⁰

⁸ See *What is Data Science?*, NYU, <http://datascience.nyu.edu/what-is-data-science/> and H. Mason and C. Wiggins, "A Taxonomy of Data Science", *dataists.com*, 25 September 2010, <http://www.dataists.com/2010/09/a-taxonomy-of-data-science/>

⁹ Machine learning is a subfield of computer science which deals with algorithms that can learn from and make predictions on data. In a business context, machine learning methods are often referred to as predictive analytics or predictive modelling. See *Wikipedia*, https://en.wikipedia.org/wiki/Machine_learning.

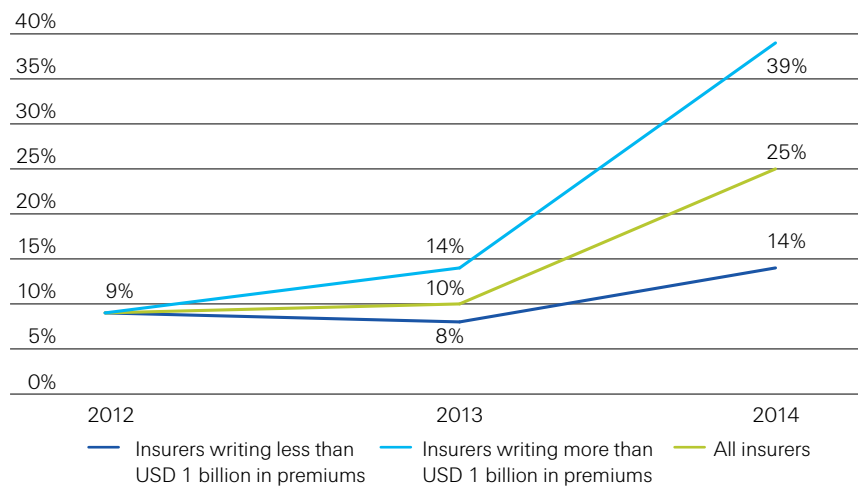
¹⁰ *Gartner Survey Reveals that 73 Percent of Organizations Have Invested or Plan to Invest in Big Data in the Next Two Years*, Gartner, 17 September 2014, <http://www.gartner.com/newsroom/id/2848718>

Key technology developments impacting life insurers

Survey evidence suggests that many insurers expect to make more use of data analytics in the coming years.

The insurance sector has been slower than many other sectors, but many insurers say they will make more use of data analytics. According to a Strategy Meets Action (SMA) survey of insurers in North America, the share of companies that invested in Big Data initiatives more than doubled to 25% in 2014 from 10% in 2013.¹¹ The most pronounced increase was at firms writing more than USD 1 billion of premiums annually. In this segment, 39% reported investing in Big Data projects in 2014, up from 14% the year before. As Figure 5 shows, insurers use data analytics mainly for sales and marketing purposes but expect to increase its use across all functions in the next 3–5 years.

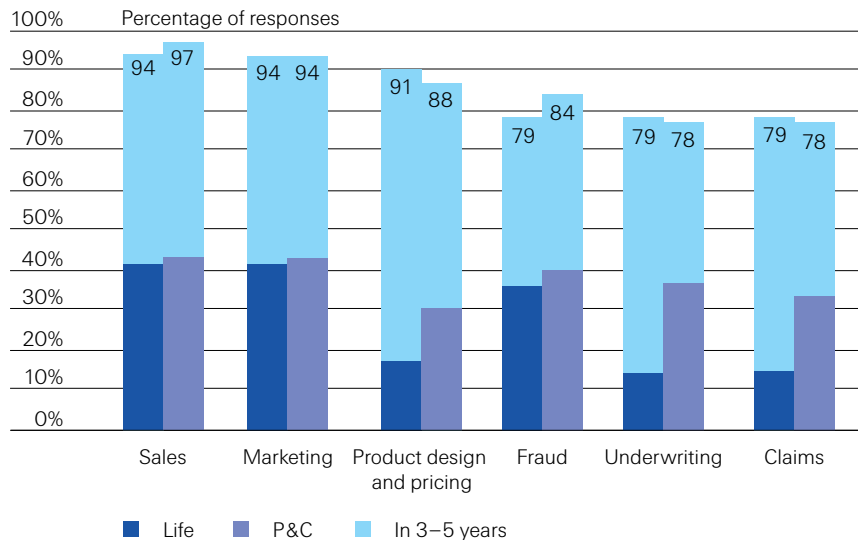
Figure 4
Share of all North American insurers investing in Big Data



Source: *Big Data in Insurance*, SMA Research, June 2014.

Figure 5
Functions in which insurers apply data analytics.

Survey question: To which functions do you apply Big Data analytics?



Note: Note: if an insurer chose “today” but not “in 3–5 years”, the “3–5 years” option was considered to be chosen as well.

Source: *Global Digital Insurance Benchmarking Report 2015*, Bain & Company, 2015.

¹¹ In 2014, SMA conducted a study on big data in insurance. 75 North American insurers participated in the survey, representing all tiers and major lines of business. For more information see: M. Breeding, *Big Data Takes Off in Insurance*, SMA, 10 September 2014, <https://strategymeetsaction.com/news-and-events/sma-blog/big-data-takes-off-in-insurance/>

Artificial intelligence and cognitive computing

Cognitive computing is the simulation of human thought processes in a computer model.

Software intelligence or cognitive computing is the simulation of human thought processes in a computerised model. Cognitive systems apply artificial intelligence (AI)¹² and machine learning algorithms encompassing various data mining, pattern recognition and natural language¹³ processing techniques to mimic the workings of the human brain. Cognitive technology is not a new concept. AI emerged as a field in the late 1950s and became a hot topic in the 1960s when computer scientists set out to build intelligent systems. There was a push to developing “expert machines” in the 1980s but limitations to computing power brought projects to a halt. Since the late 1990s, the AI and cognitive computing fields have seen rapid breakthroughs enabled by several key developments, including an exponential increase in computational power,¹⁴ a decline in related costs, and the availability of vast quantities of digital information. These have facilitated the development of advanced machine learning techniques such as pattern recognition systems.

Cognitive systems can be faster and more efficient than humans in ...

Cognitive systems continually learn from large sets of data and apply that knowledge to future situations. The expectation is that the systems will be able to answer complicated questions in faster and more efficient ways than humans in all sorts of industries, including health care, pharmaceuticals, finance, insurance and law (see Box: “It’s elementary, my dear Watson”).

... gathering and processing information.

Importantly, cognitive systems can add value by overcoming limitations in human cognitive abilities. For example, it can be difficult for humans to process large amounts of data rapidly, and to understand the interactions of elements in large, complex systems. Cognitive systems can vastly extend the ability to gather and process information, and also to discover new and contrarian ideas, hidden patterns, identify previously undetected relationships and to make more accurate predictions. They can also help subject-matter experts keep up with latest knowledge and research by quickly analysing and synthesising millions of documents for relevant information. And lastly, cognitive systems can be more objective than humans in formulating and testing a number of hypotheses. Humans, in contrast, are prone to bias based on experience, professional background and intuition.

Cognitive systems can create new areas of innovation in life insurance.

Cognitive systems carry the promise of vastly enhancing many areas of human activity, freeing up resources to be redirected to capacities where computers remain inferior to humans. They will inevitably replace some types of knowledge work. For example already today, financial advisers face competition from robo-advisers built on the algorithms that originally served the traditional financial advisor community. Cognitive communication systems able to conduct a question-and-answer dialogue with consumers have the potential to create new areas of innovation. This includes the work traditionally completed by insurance agents, advisors or claims handlers. Technology can make these individuals more productive and take away some of their more mundane work.

¹² Artificial intelligence is computers and computer software capable of intelligent behaviour. The main goals of AI include "reasoning, knowledge, planning, learning, natural language processing (communication), perception and the ability to move and manipulate objects." See *Wikipedia*, https://en.wikipedia.org/wiki/Artificial_intelligence

¹³ "Natural language or ordinary language is any language that develops naturally in humans through use and repetition." See *Wikipedia*, https://en.wikipedia.org/wiki/Natural_language

¹⁴ In the last 50 years, the power or computing (chip) performance has doubled approximately every two years. This trend is dubbed “Moore’s law”, after Gordon E. Moore, co-founder of the Intel Corporation and Fairchild Semiconductor, who in a 1965 paper described a doubling every year in the number of components per integrated circuit. See *Wikipedia*, https://en.wikipedia.org/wiki/Moore's_law

Key technology developments impacting life insurers

An example of cognitive computing is IBM's Watson.

Watson is capable of understanding questions and providing answers based on analysis of all available information.

Commercial applications are growing rapidly.

"It's elementary, my dear Watson"¹⁵

One example of cognitive computing from IBM's Watson¹⁶ computing system. Watson is an artificial intelligence computer system capable of answering questions posed in natural language. The system was showcased in the TV quiz show Jeopardy! where it competed in 2011 and won against all human competitors.

Watson is a combination of AI, machine learning and natural language technologies. It decomposes questions to understand the context of what is being asked, analyses all available information in research and articles, and comes up with plausible answers. It has the ability to quickly execute hundreds of proven language analysis algorithms simultaneously. It is probabilistic and generates potential answers with a level of confidence. The more algorithms that find the same answer independently, the more likely Watson is to be correct. Watson can sift through the data equivalent of about 1 million books, analyse the information and provide responses to complicated questions in less than three seconds.

Commercial applications of Watson technology are growing. In healthcare, a version of Watson is being used to accelerate and increase the accuracy of the treatment process based on an analysis of thousands of pages of medical papers, treatment guidelines, electronic medical record data, notes from physicians and nurses, research material, clinical studies, journal articles and patient information. IBM has partnered with pharmaceutical companies to help understand drug interactions by making connections across millions of articles, journals and studies. Firms from a range of other industries, including financial services, travel, telecom and retail, are working with IBM to create apps and services embedded with Watson's capabilities.

Medical innovation spans many domains.

Medical technologies

Medical innovation is transforming the way healthcare systems operate. Disruptive technologies in healthcare are based on interdisciplinary advancements across the natural sciences, medicine and technology. They span many domains, including the use of electronic processes and devices (eHealth), genomics, regenerative medicine, robotic surgery, diagnostic and therapeutic methods based on microsystems or nanotechnology, new medical devices, drug delivery tools, and others. These developments are forcing a shift in healthcare toward prevention, early diagnosis and more effective treatment outcomes, which could have significant influence on health risks. They are also helping consumers gain better insight into their own health status, and motivating them to action healthier lifestyles. This could also be another important consideration in the design of life and health insurance policies. Among the disruptive medical technologies, eHealth, genetic testing, and wearables bear most relevance for life insurance because of their direct implications for risk assessment and underwriting.

¹⁵ The most famous of quotes attributed the Sir Arthur Conan Doyle's fictional detective character Sherlock Holmes, even though Doyle never actually wrote those words for Sherlock Holmes. See "Sherlock Holmes Quotes", sherlockholmesquotes.com, <http://sherlockholmesquotes.com/Elementary-My-Dear-Watson.html>.

¹⁶ The IBM Watson computing system, however, was named after IBM's first CEO, Thomas J. Watson.

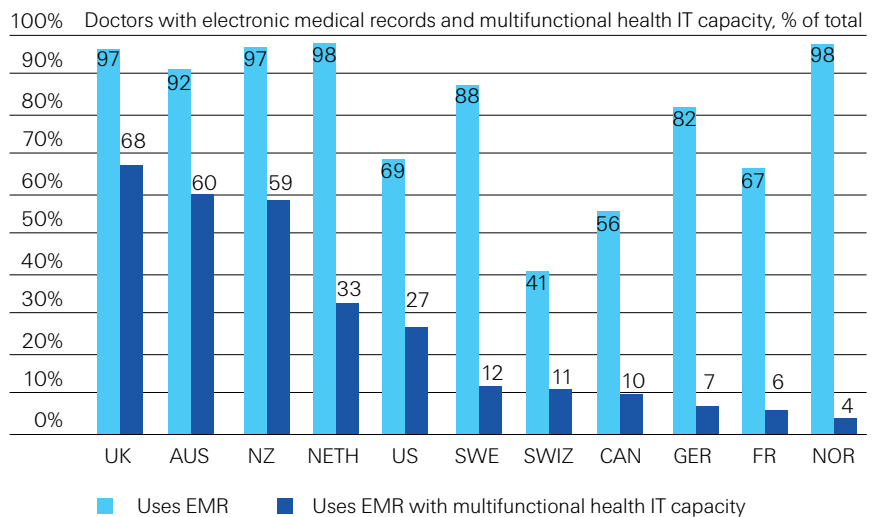
eHealth covers a range of systems at the edge of medicine, health care and IT.

eHealth

The term eHealth is relatively recent and refers to a range of services or systems at the edge of medicine, healthcare and information technology (IT). Key healthcare practices supported by electronic processes include:

- Systems for electronic health (or medical) records (EHR),¹⁷ patient data management, diagnostic tests and treatments, and transmission of prescriptions from doctors to pharmacists.
- Telemedicine, which is physical and psychological diagnosis, and treatment, at a distance, including tele-monitoring of patients functions.
- mHealth, which includes the use of mobile devices to collect health data, provide healthcare information to practitioners, researchers and patients, and to monitor patients' vitals in real time.
- Health knowledge management systems, providing information to healthcare practitioners for use in clinical decision-making, and also best-practice guidelines and epidemiological tracking of medical research.

Figure 6
International adoption of electronic medical records and health IT capacity



Note: Multifunctional health IT capacity – uses electronic medical record and at least two electronic functions: for order entry management, generating patient information, generating panel information, and routine clinical decision support.

Source: *The Commonwealth Fund 2012 International Health Policy Survey of Primary Care Physicians*, The Commonwealth Fund, November 2012.

¹⁷ EHR systems enable electronic collection of health information with the primary purpose of providing healthcare and related services. The information can be transmitted, updated or retrieved securely and in real-time both at the point of care and in remote locations.

Key technology developments impacting life insurers

Governments are pushing for adoption of electronic health records.

There is growing evidence that the use of technology in health IT leads to lower costs and improved health outcomes. This, and pressures to contain medical cost increases, creates incentives for everyone in the healthcare sector to use health IT. Adoption of EHR systems varies from country to country for many reasons (see Figure 6), including type of healthcare system, technical and financial barriers, and concerns about privacy and security.¹⁸ In the US, the Health Information Technology for Economic and Clinical Health (HITECH) Act from 2009 made a substantial commitment of federal resources (USD 27 billion) to support adoption of EHR.¹⁹ In Europe, where healthcare practices are largely localised, a report commissioned by the European Commission found that a pan-EU EHR system would not be technically feasible and cost-effective. It has instead urged more emphasis on decentralised efforts to create smaller scale eHealth systems.²⁰

Advancements in genomics hold great potential to transform medicine.

Genetic testing

Advancements in genomics hold great potential to transform medicine, by making it possible to scan a person's genetic profile to predict risk areas and customise medical treatments. Genetic testing identifies changes in chromosomes, genes and proteins to detect possible presence of genetic diseases, or mutant forms of genes associated with increased risk of developing genetic disorders. Most genetic tests are used to confirm or rule out a suspected genetic disease, and to detect the presence of genes that predispose a person to a particular illness or condition.

Availability of genetic testing has expanded greatly and costs have plummeted.

The availability and variety of genetic tests has expanded greatly over time, and the costs thereof have plummeted. Not too long ago, only some research laboratories were capable of conducting genetic testing. Today, in the US alone there are over 500 laboratories that do so.²¹ Fifteen years ago, the cost of sequencing a human-sized genome was close to USD 100 million; now it's around USD 4 000²² and is expected to fall below USD 1 000 soon.²³

Wearables are mini-computers and sensors incorporated in items that can be worn on the body.

Wearables, Internet of Things and digital health

Wearable devices or simply "wearables" are mini-computers and sensors incorporated in items (eg, wrist bands, watches, glasses or clothes) that can be worn on the body. Similar to handheld devices, wearables can display, process and store information and usually have some communication capabilities. For example, California-based Augmedix has developed smart glasses based on the Google Glass platform that document doctors' visits to patients, including data entry associated with a patient's EHR.²⁴ In addition, patient test results can be displayed directly without the doctor having to look at a computer screen. This gives the physician more time to focus on the patient. The glasses also have sensory features, such as tracking of vitals that go beyond those of handheld devices.

¹⁸ Molly Porter, "Adoption of Electronic Health Records in the United States", *Kaiser Permanente*, February 2013.

¹⁹ The deadline for implementation is 2015 and those who do not meet it will have to pay penalties to the government in the form of reduced Medicare payments. Physicians who have not adopted EHR systems by 2015 will receive Medicare reimbursements reduced by 1%. The deduction rate increases to 2% in 2016, 3% in 2017, and 4% in 2018.

²⁰ K.A. Stroetmann, J. Artmann, V.N. Stroetmann et al., *European countries on their journey towards national eHealth infrastructures – evidence of progress and recommendations for cooperative actions*, European Commission, DG Information Society and Media, ICT for Health Unit, 2011.

²¹ *Genetic Testing: How it is Used for Healthcare*, NIH Fact Sheet, October 2010.

²² *DNA Sequencing Costs – Data from the NHGRI Genome Sequencing Program (GSP)*, National Human Genome Research Institute, <http://www.genome.gov/sequencingcosts/>

²³ Robert Klitzman, "Doctor, Have You Had Your DNA Tested?", *New York Times*, 5 February 2015.

²⁴ The commercial viability of Google Glass has been under question, but Augmedix's smart glasses are one of several in-the-work place applications that are seen as giving renewed life to the technology. "Google Glass Finds a Second Act At Work", *MIT Technology Review*, 24 July 2015, <http://www.technologyreview.com/news/539606/google-glass-finds-a-second-act-at-work/>

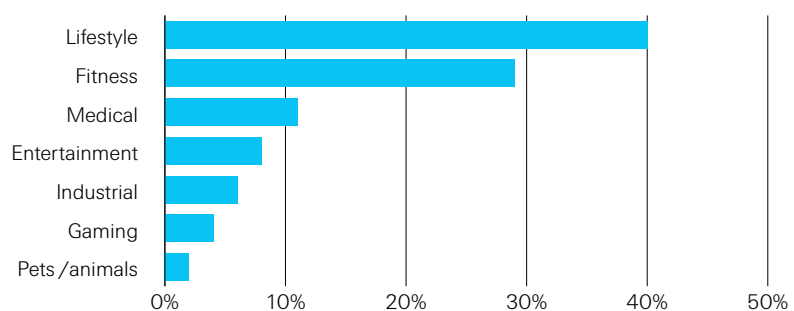
The Internet of Things is expanding the world of possibilities for remote devices.

The number of connected devices in use in the world is forecast to grow fivefold in the next 10 years.

Figure 7
Wearable devices by area of market focus, % of total

Wearables have been used in hospitals for a long time, for example to detect health disorders like sleep apnoea. Recently, wearables have expanded into the consumer segment also, for instance fitness trackers and smart watches (see Figure 7).²⁵ Typical features include tracking of steps, calories spent and heart rate.

By 2025, the number of connected devices in use is expected to total around 25 billion, up from 5 billion today.²⁶ The increase will come with the significant drop in hardware prices, which is putting sensors, processing power, network bandwidth and cloud storage within reach of more users and making a wider range of IoT applications practical. Progress toward ubiquitous wireless coverage at a low cost and advances in data analytics have further fuelled the growth of and, importantly, will support the productive use of data generated by the IoT.



Note: Total number of devices: 347, as of 9 September 2015.
Source: Wearable Technology Database, Vandrico Inc.

Wearables have the potential to revolutionise the healthcare system ...

The already mentioned consumer applications, gadgets that create “smart homes” with sensors that track occupants’ usage patterns and adapt energy consumption levels accordingly, and the self-driving car have so far attracted the most attention. However, according to McKinsey, business-to-business applications are expected to account for nearly 70% of the estimated value that will flow from the IoT technology in the next 10 years.²⁷ The healthcare sector will be a main beneficiary. Wearables and IoT technology have the potential to radically change care services and treatment outcomes. For example, the technology can make the diagnosis, prevention and treatment of chronic diseases more efficient with improved remote monitoring techniques. Until now, most doctors have had a limited ability to collect and monitor information on health status once a patient leaves a hospital or medical facility. In the future, they will be able to monitor patients’ heart rates remotely with easy-to-use patches attached to the skin, thus improving early detection of heart attack risk.

²⁵ For a detailed listing of wearable devices areas of market focus, see Vandrico Inc’s wearable technology database at <http://vandrico.com/wearables>

²⁶ Ibid.

²⁷ Ibid.

Key technology developments impacting life insurers

... for example in the area of remote patient monitoring ...

Likewise, for many years diabetes patients have had to have the glucose levels in their blood tested several times a day. New continuous glucose monitoring systems (patches bearing a tiny needle under the skin) allow for real-time measurement 24/7. Meanwhile, Google and Alcon are working on a contact lens that measures glucose levels in tears.²⁸ Another example is Sotera Wireless' ViSi Mobile system, which has been granted FDA approval.²⁹ The system allows clinicians to monitor patients' blood pressure and other core vital signs including pulse rate, skin temperature, electrocardiogram, blood oxygenation and respiration rates.

... and by improving adherence to medical prescriptions.

Another area in which wearables offer potential for improvement is adherence to medical prescriptions. According to the Centers for Disease Control and Prevention in the US, in about 50% of cases medication is not continued as prescribed, limiting the effectiveness of therapies.³⁰ Proteus Digital Health, a California-based company, has developed ingestible sensor technology, which – when used with a medication – marks actual intake time. The sensor communicates with an adhesive patch worn on the torso, which in turn transmits the data to a mobile app. In addition, the wearable sensor can record basic physiological data such as heart rate and activity/rest, generating some record of drug response.³¹ Such technologies can help fine-tune and personalise drug treatment, leading to better health outcomes and reduced health risks. The new information could also be used to determine the scope of cover and pricing of insurance policies.

²⁸ *Novartis to license Google "smart lens" technology*, Alcon, 15 July 2014, <http://www.alcon.com/news-center/news-item.aspx?id=307>

²⁹ "FDA Approves ViSi Mobile System for Cuffless, Non-Invasive Continuous BP Monitoring", *medgadget.com*, 10 October 2013, <http://www.medgadget.com/2013/10/fda-approves-visi-mobile-system-for-cuffless-non-invasive-continuous-bp-monitoring.html>

³⁰ *Medication Adherence*, Centers for Disease Control and Prevention, 27 March 2013, <http://www.cdc.gov/primarycare/materials/medication/docs/medication-adherence-01ccd.pdf>

³¹ With the increased use of wearables for medical purposes, there has been some debate about whether such devices should be under regulatory scrutiny. In the US, the Food and Drug Administration (FDA) issued a draft guidance in January 2015, suggesting that low risk devices intended for only general wellness use should be exempt from regulatory oversight. The vast majority of wearable devices, such as step counters and calorie intake monitors, will therefore not be regulated. Devices, marketed for treating diseases, however, will fall under FDA scrutiny. See <http://www.fda.gov/downloads/medicaldevices/deviceregulationandguidance/guidancedocuments/ucm429674.pdf>

Impacts on the life insurance industry

Change beckons across the life insurance value chain.

Underwriting is going to become easier and more effective.

Automation of underwriting has been a growing trend in life insurance.

Technology will have an enormous impact on the insurance industry over the next decade, across the value chain from product development and underwriting through to distribution, services and claims. In the near term, the largest impact is likely to be on underwriting and distribution (broadly defined).

Impact on underwriting

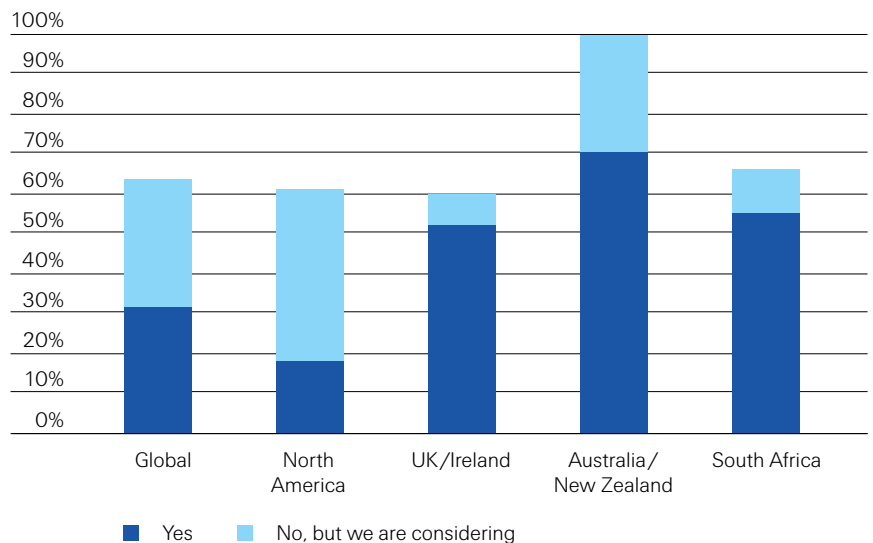
Advances in technology have the potential to radically transform underwriting in life insurance. Lengthy, complex and invasive underwriting processes have long been viewed as an impediment to reaching and engaging with more of the un- and underinsured. Traditional underwriting techniques to differentiate and select risks are effective, but the process is time consuming and involves high costs. New data sources, platforms to store and analyse data, and fast, innovative technologies to mine the data or simply automate existing processes have the potential to reduce the length and invasiveness of risk assessment, improve risk selection and refine policy pricing.

Automated underwriting

Automated underwriting has been a growing trend in life insurance. A Select X and Hank George Inc. survey found that about a third of life insurers globally used automated underwriting in 2011, and another third were considering doing so (see Figure 8).³² The findings are consistent with a more recent global survey by Bain and Company,³³ according to which about a third of the firms surveyed said they can auto-underwrite life protection and savings products, and slightly more than half expect to be able to do so in three to five years (see Figure 9).

Figure 8

Current use of underwriting engines



Source: *Underwriting engines: the new strategic imperative in life and disability business*, Select X and Hank George Inc., 2011.

³² *Underwriting engines: the new strategic imperative in life and disability business*, Select X and Hank George Inc., 2011.

³³ *Global Digital Insurance Benchmarking Report*, Bain & Company, 2015.

Impacts on the life insurance industry

Automated systems can flag risk factors and complete simplified underwriting for small amounts.

The technology in automated systems performs all or some of the screening functions traditionally completed by underwriters, thus reducing the human involvement, time and/or data necessary to underwrite an insurance policy. Different levels of automated systems are currently available. At a basic level, automation is used to screen an applicant's information and flag risk factors that an underwriter must review more carefully before making a decision (for example, results in a blood test that are outside acceptable boundaries, such as high cholesterol levels). The next level of automation are systems designed to complete simplified underwriting for smaller face amounts (often in the range USD 100 000 to USD 250 000), without medical testing. These systems have become more widespread in recent years. They can accept or reject an application for insurance cover. In some cases, the system can place an applicant into a standard, smoker or preferred category, or refer him/her for further assessment.

More advanced automated systems enable full underwriting.

A third category of automated systems allows for full underwriting by essentially translating a company's underwriting manual into programmed rules. Applicants complete a questionnaire and undergo the company's standard criteria assessment (eg, age and amount of cover required). The application is processed automatically, the system also pulling in third-party information and laboratory results. The system interprets the information and determines whether to issue, decline or forward an application to an underwriter for further evaluation if necessary, for example if a physician's statement is required.

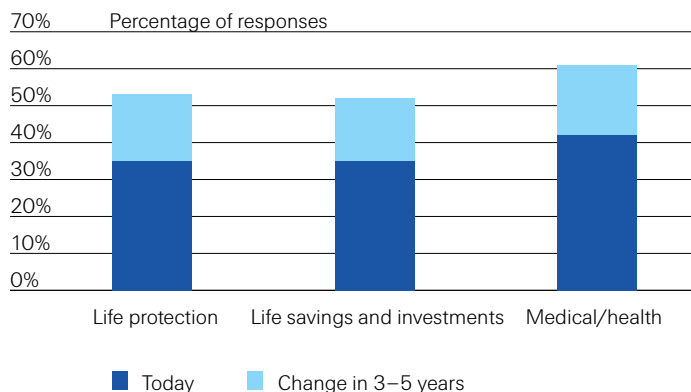
Cognitive computing will push automated underwriting to new frontiers.

Developments in cognitive computing will advance automated solutions by bringing more consistency to underwriting decisions and by making the process faster and more cost-effective. Integration of the learning capabilities of cognitive systems, and also their voice recognition and text reading algorithms, will make it possible to extract meaningful information from all sources of data, including unstructured medical reports. Cognitive systems can be developed to read an applicant's information, put it in context, extract all relevant facts, compare with the rules and guidelines in underwriting manuals, make a decision on the application, and set a premium for cover if the application is accepted. However, given that cognitive computing is based on probabilities and use of unstructured data, insurers are more likely to use it as an advisory tool rather than to make final decision on whether to accept or reject an application for cover. Insurers will likely use a combination of cognitive and rule-based logic to streamline the underwriting process for some while yet. Digitalisation in healthcare and wide availability of EHR will make the use of cognitive systems more effective to this end.

Figure 9

Percent of insurers who can auto-underwrite life and health products.

Survey question: What share of your business can you auto-underwrite?



Source: *Global Digital Insurance Benchmarking Report 2015*, Bain & Company, 2015.

New, alternative data sources can be used to assess risk and underwrite life insurance.

EHR may begin to transform underwriting fairly soon.

Data from health monitoring devices could be part of the risk assessment and pricing equation.

Likewise genetic data ...

... although first there needs to be more consistent regulation on the use of genetic profile information in underwriting decisions.

Opportunities from new data sources

The traditional model of underwriting in life insurance involving evidence from consumers on their own and their family's medical history, alongside third-party information, has been slow to evolve. The rapidly expanding universe of data in digital form – from EHR, connected devices, social media and other sources – provide alternative data sources which insurers could use to better assess and price risk, and in different ways. Use of non-traditional data will likely become more prevalent and may even eliminate the need for medical exams for many customers.

Some commentators believe EHR hold the greatest potential to transform underwriting in life insurance. EHR contain various types of data including lifestyle characteristics, medical history, family history, clinical biomedical indicators and prospective medical treatments. Getting the medical records of an applicant to underwrite a policy is currently a cumbersome and time-consuming process, with most of the information provided in print format. Because of the vast amounts of unstructured data, the systems are more focused on providing a synopsis for presentation to the underwriter rather than decision making. Ability to instantaneously access medical history with the individual's consent in digital form eliminates the need for underwriters to search and wait for critical information, greatly streamlining and speeding up the underwriting process, and significantly reducing costs.

Data from health monitoring devices such as Apple's HealthKit and Jawbone's UP on physical activity levels, diet, sleep patterns and heart rate etc may also become useful. It is currently challenging to interpret these data for underwriting purposes because there is not enough research and experience to link the indicators to health outcomes with a comfortable degree of confidence. Companies are launching products that make use of these data (eg, the Vitality programme - see Box: Vitality rewards programme on page 24) though at the moment they have a low level of credibility on the underwriting side and are more of a customer engagement/retention tool. But in time this should improve. Growing ability to measure and monitor risks on an ongoing basis could also open opportunities for life insurers to personalise pricing in real time, adapt products over time, and expand insurability or augment pricing for conditions where life and health risks can be mitigated by healthier lifestyles and behaviours. For example, a healthy diet and increased levels of exercise are known to improve outcomes for people suffering from chronic conditions such as high blood pressure and diabetes. People who alter their behaviours in a positive way may qualify for lower premiums rates.

Another prospective source of information is the genetic profile of an individual. Genomic knowledge is evolving rapidly and genetic data, if available to insurers, could facilitate more accurate prediction of risks by illuminating disease susceptibility, disease-specific genes and pre-disposition to certain conditions. Genetic testing is already aiding the diagnosis, prevention and treatment of certain diseases. As its benefits become more widespread, health risks for many individuals may be lowered, making them insurable at a better rate.

One of the challenges for insurers is lack of consistent regulation on the use of genetic data for underwriting in life and health. In Europe, many countries have banned the use of genetic data by insurers. For example, in the UK, there is a moratorium on the use of genetic information until 2019. Meanwhile in Austria, Belgium, Denmark, France, Norway and Portugal, the use of predictive genetic test results for insurance purposes is not allowed. In the US, the Genetic Information Nondiscrimination Act (GINA) bars use of genetic information in health insurance underwriting decisions, but not for life, long-term care or disability insurance. Nonetheless, some states in the US bar the use of genetic test results, others prohibit decisions based on genetic information, and some require informed consent. A more unified approach would benefit all concerned.

Software platforms that allow consumers to share their data with third parties are being developed.

Examples of consumer controlled data-sharing platforms include digi.me and ...

... Human API.

Predictive analytics can streamline and cut the costs of underwriting.

Platforms for sharing of data by end consumers

Another area of technological advance expected to enhance underwriting efficiency are interfaces for automated delivery of information and data to insurers by end consumers. With the proliferation of data gathered on and via different devices, several firms are developing software platforms that allow consumers to access and share their data. The idea is to give consumers control of their data and the ability to share them with other parties such as healthcare providers and insurance companies, while protecting their own privacy. For insurers, the platforms will reduce the cost of collecting health information and provide a more complete view of their customers for use in risk assessment and pricing.

Examples of consumer controlled data-sharing platforms

Digi.me is a start-up developing software to provide an interface for consumers to compile and manage their personal data.³⁴ At present digi.me focuses on retrieving information about a consumer from his/her personal data on social media sites such as Facebook, Twitter, Instagram and LinkedIn. It analyses the information to provide new insights to the consumer. The intention is to expand the capability to retrieving and analyzing information about an individuals' health and financial status, among others, from data stored in other online sites. Third parties will also be able to purchase information about a consumer from digi.me, with the consumer's consent.

*Human API*³⁵ is a start-up developing a software platform to retrieve, clean and structure health-related data from various sources, and deliver it automatically in real time to third parties such as healthcare providers or insurance companies, with the explicit permission of the individual concerned. According to its founder, Human API wants to integrate and automate delivery of health-related data stored in digital format in many disparate datasets (eg, wearables, traditional clinical and lab data, hospitals and doctors' offices, and genetic labs).³⁶ The start-up is partnering with companies providing health and activity monitoring devices including Fitbit, iHealth and Jawbone and healthcare providers to make the integration possible. Human API will charge a fee each time a data user retrieves information using its platform.

Predictive analytics

Predictive modelling is the use of advanced statistical techniques and data analysis to make inferences or identify meaningful relationships in order to predict future outcomes. With adequate data, predictive modelling can be an alternative means to differentiate and select risks. For example, it can help identify lower-risk individuals, leading to a streamlined underwriting process that is more convenient and customer friendly for healthy applicants. Use of predictive analytics in underwriting can lead to lower costs and improve the overall mortality experience. It can also be useful in client segmentation, marketing, claims management and inforce business retention.

³⁴ R. Moore-Colyer, "V3 Startup Spotlight: Social network data library digi.me", *V3.co.uk*, 21 July 2015, <http://www.v3.co.uk/v3-uk/interview/2418321/v3-startup-spotlight-social-network-data-library-digime>

³⁵ API stands for Application Programming Interface.

³⁶ "Human API CEO On Unifying Health Data", *informationweek.com*, 5 November 2014, <http://www.informationweek.com/healthcare/electronic-health-records/human-api-ceo-on-unifying-health-data/a/d-id/1317195>

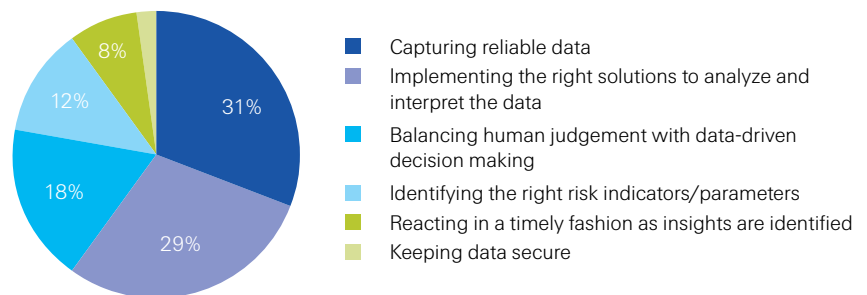
Adoption of predictive modelling has been slow in life insurance.

Challenges stem from the longer duration of life insurance policies and lower claims frequency.

The life industry has been slow to implement advanced data mining and predictive analytics techniques, but this will likely change. A 2009 study, sponsored by the Society of Actuaries, found that only 1% of North American life insurers surveyed were utilising predictive modelling in their underwriting.³⁷ In other industries, such as banking, P&C insurance and bancassurance, these techniques have become widespread.³⁸ In the P&C sector, for example, many companies use financial and credit history data to underwrite personal auto and homeowners insurance products.

The use of predictive analytics in life insurance has been hampered by challenges to modelling risks that stem from the longer policy duration and lower claims frequency. Sufficient, high-quality historical data – a critical first component of any model – are often not readily available.³⁹ Moreover, it is difficult to come up with robust predictors of the mortality rate, which is the ultimate target variable, especially at younger ages. Thus life insurers have focused on building models to predict related proxy variables, such as underwriting class/risk category (eg, standard vs non-standard risk) or smoker status. Models frequently aim to identify customers most likely to be in the standard risk category and offer them cover with reduced underwriting requirements at fully underwritten rates. According to a 2014 KPMG International survey, capturing reliable data and implementing the right solutions to analyse and interpret the data are key challenges for insurers using data analytics (See Figure 10).

Figure 10
Challenges faced by companies using data analytics



Source: *Digital Technology's Effect on Insurance survey*, KPMG International, May 2014.

Some life insurers use predictive models to cut back on the amount of traditional underwriting information required.

In some markets such as the US, life insurers have been more comfortable using predictive techniques to triage applications and offer streamlined underwriting that avoids expensive medical tests for healthy people.⁴⁰ Companies taking this approach use analytical models to replicate fully-underwritten decisions. Where a model's predictions align closely with fully underwritten decisions, its algorithms can be used to predict underwriting decisions for future applicants, bypassing medical tests and streamlining the purchase process for some applicants. For example, Principal Financial has introduced a predictive underwriting program that relies on data from traditional sources. And Aviva in the US has used a predictive modelling system based partly on consumer-marketing data, reportedly getting results that mimicked well traditional underwriting techniques. The model was built on the premise that many diseases relate to lifestyle factors such as exercise habits and fast-food diets.⁴¹

³⁷ *Automated Life Underwriting, A Survey of Life Insurance Utilization of Automated Underwriting Systems*, SOA and Deloitte, December 2009.

³⁸ *Predictive Modeling for Life Insurance, Ways Life Insurers Can Participate in the Business Analytics Revolution*, Deloitte, April 2010.

³⁹ *Ibid.*

⁴⁰ *Ibid.*

⁴¹ L. Scism and M. Maremont, "Insurers Test Data Profiles to Identify Risky Clients", *Wall Street Journal*, 19 November 2010.

Principal Financial uses predictive modelling to speed up the underwriting process for healthy applicants ...

... and offer them coverage at fully underwritten rates.

New types of data and analytical tools will help expand the use of predictive underwriting.

Better understanding of risks will push the boundaries of insurability.

Predictive analytics in underwriting: the Principal Financial example

In 2014, Principal Financial in the US rolled out an accelerated underwriting program that relies on traditional sources of information to identify good risks and make the underwriting process quicker and easier. The program uses data from the MIB Group,⁴² motor vehicle reports and prescription records. Applicants go through a phone interview that uses Principal Financial's TeleApp electronic application to collect their personal history. Qualifying individuals' applications can be approved within 48 hours with a super-preferred or preferred rating. Eligible applicants include individuals aged 18-60 applying for any retail life insurance product with face amount up to USD 1 million.⁴³

Other life companies offer simplified underwriting processes with a short list of questions and instant approval, but at higher premium rates than those of fully underwritten products. What differentiates Principal Financial's approach is that it offers eligible applicants the same product characteristics and premium as a fully underwritten product. According to company sources, 50-60% of eligible preferred and super-preferred applicants qualify for accelerated underwriting.⁴⁴

In the future, easier access to data in digital form and from non-traditional sources will enable a more widespread use of predictive analytics in underwriting. Ability to retrieve medical records instantaneously holds big promise. It will accelerate the process and lead to better underwriting decisions, because electronic medical records can easily go through predictive algorithms to produce more consistent results than human deliberation. New tools for data analysis will also help. The premise is that there are correlations between lifestyle factors and mortality, and that more data and new data mining techniques will unearth these. Some early experiments have shown this to be the case, although simplifying the underwriting using a model based on such techniques did not induce more customers to buy the product. Life insurers currently do not make widespread use of third-party data on consumers beyond the types used traditionally (eg, from MIB Group, motor vehicle reports and prescription records in the US) due to concerns about regulatory and reputational risks, but the acceptance of using such data should improve over time.

Pushing the boundaries of insurability

Technological advancements and a flood of data will lead to better understanding of risks and a shift from traditional, experience-based underwriting to a real-time, exposure-based approach. Life insurers have traditionally assessed health risks and asked questions about lifestyle behaviours linked to a higher risk of mortality just once – at the point of selling a policy. Technology now allows trusted insurers to access data regularly with the permission of high-risk customers in exchange for insurance that had at one point been unaffordable or unavailable. Now it can be offered as a renewable product where the patient needs to provide continuous proof of good health. Conversely, low-risk customers may want to push data to their insurance providers in exchange for lower premium rates.

⁴² MIB Group, Inc (formerly The Medical Information Bureau Inc.) is a cooperative data exchange formed by the North American life insurance industry in 1909. MIB is the only insurance consumer reporting agency in North America and operates a database of medical information on some individuals who have previously applied for health insurance, life insurance, disability insurance, critical illness insurance and long-term care insurance.

⁴³ A. R. O'Donnell, "The Principal Speeds Life Insurance Underwriting to Within 48 Hours Without Labs," *Insurance Innovation Reporter*, 3 March 2014, <http://iireporter.com/the-principal-speeds-life-insurance-underwriting-to-within-48-hours-without-labs/>

⁴⁴ *Accelerated Underwriting Program*, The Principal Financial Group, www.principal.com

With new technology, some life insurers are underwriting risks previously deemed uninsurable.

Some life insurers have been able to underwrite risks that previously could not be covered profitably. An example is AllLife, a life insurer in South Africa which has used better data and monitoring to offer insurance to people suffering from manageable diseases like HIV and diabetes.⁴⁵ To maintain their cover, policyholders have to go for regular blood tests and, in the case of HIV, take antiretroviral medication as prescribed. AllLife sends reminders for tests and monitors results, pulling data directly from medical providers with a client's permission. Under South African law, if a policyholder does not follow treatment protocol, benefits or coverage can be lowered or cancelled. The company assesses its risk every three to six months.

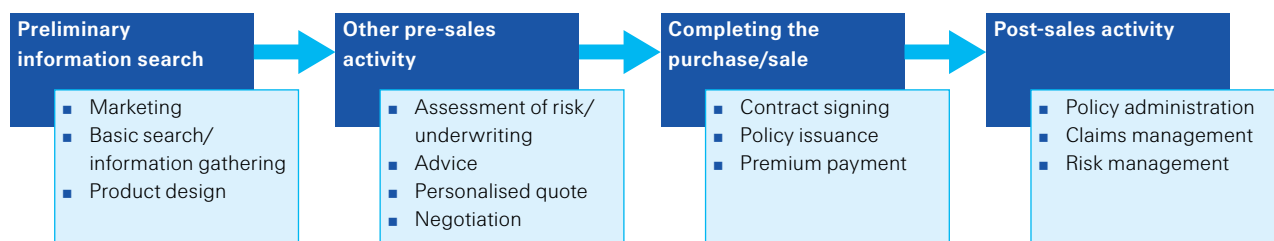
Impact on distribution

Distribution is more than the actual purchase/sale transaction.

In the context of this *sigma*, distribution is defined as the actual purchase/sale transaction and all other interactions an insurer has with its customers. These include, for example, the provision of and access to information on products and prices, negotiations with consumers, and after-sales and customer retention activities (see Figure 11).

Figure 11

Activities in the insurance distribution chain



Source: *sigma* 2/2014 – Digital distribution in insurance: a quiet revolution, Swiss Re.

Intermediaries continue to dominate distribution.

Traditionally, specialist firms have bundled together some or all of these distribution activities and intermediated between customer and insurer. Intermediaries continue to dominate distribution of life insurance around the world. Direct sales in terms of premiums, including those by insurers' own sales forces, typically represent less than a quarter of life insurance sales. But new types of intermediaries from both within and outside insurance are becoming more prominent, challenging the traditional agent-broker model.⁴⁶

⁴⁵ E. Brat, P. Clark et. al. "Bringing Big Data to Life: Four Opportunities for Insurers", *bcbperspectives.com*, 17 July 2014, https://www.bcbperspectives.com/content/articles/insurance_digital_economy_Bringing_big_data_life/

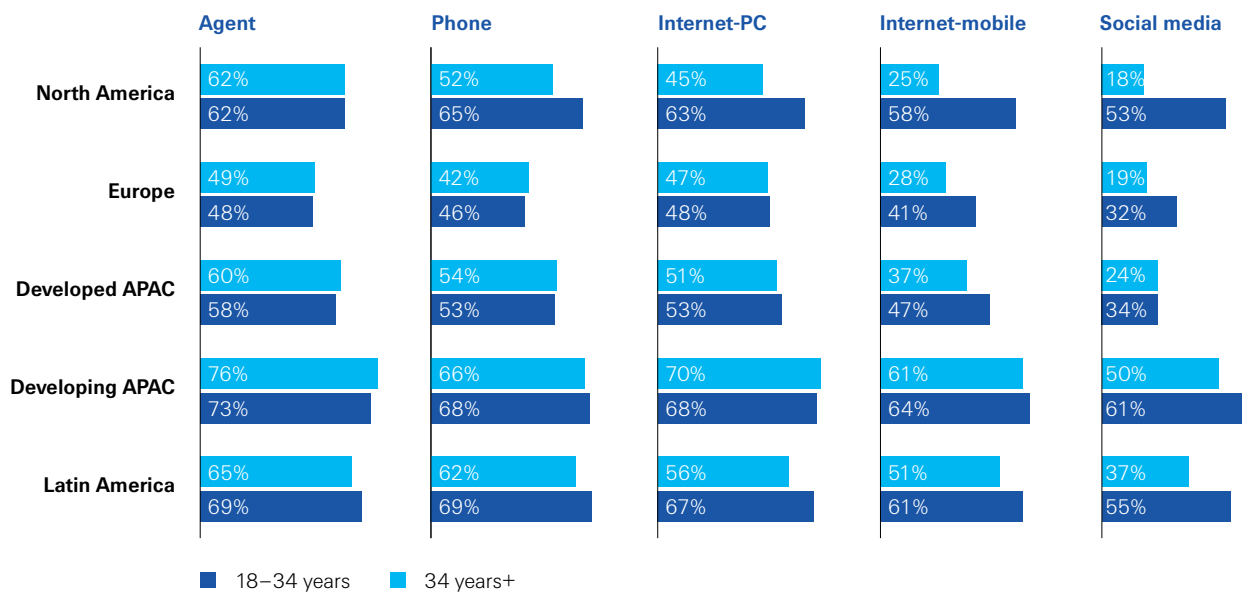
⁴⁶ For a detailed discussion, see *sigma* 2/2014 Digital distribution in insurance: a quiet revolution, Swiss Re.

Impacts on the life insurance industry

The internet and mobile-based distribution channels are becoming increasingly important in insurance ...

The importance of new distribution channels such as the internet, smartphones and social media in life insurance is increasing. According to a recent study of consumer views about the importance of various distribution channels, the internet and mobile channels exhibited the largest increases in importance between 2012 and 2014.⁴⁷ For those aged 34 years and older, the traditional agent-based distribution channel remains most important but for 18-34 year olds – the key age for buying life insurance – online distribution is as important as traditional agents (see Figure 12).

Figure 12
Importance of distribution channel by age and region, life insurance, 2014



Source: *World Insurance Report 2015*, CapGemini/Efma, 2015.

... but customer satisfaction with these new channels is still low.

This contrasts with the satisfaction of life insurance customers with different distribution channels. Across all regions, the insurance agent provides the highest level of positive customer experience (see Figure 13). Today's consumers, particularly younger people, have become used to an innovative and customer-friendly digital experience through their dealings with, for instance, online retailers and the travel sector. They expect the same from insurers but are not getting it, yet. There is a need for the insurance industry to improve its digital delivery capabilities.

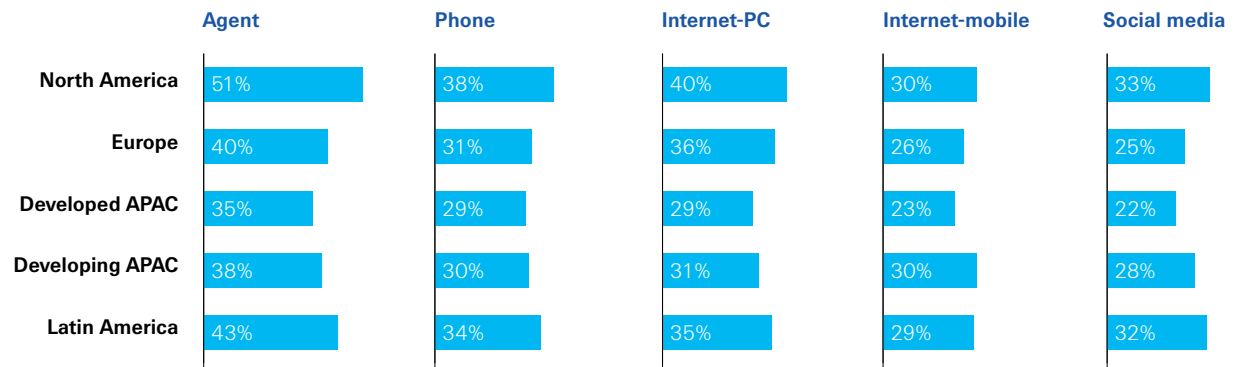
A multi-channel approach is needed for effective distribution.

Effective distribution is not about focusing on one channel. Rather, strategy should be geared towards reaching potential customers in a timely fashion with relevant content through preferred consumer channels. New technologies and increased data availability can help insurers tailor a multi-channel delivery approach to optimal effect.

⁴⁷ 2015 *World Insurance Report*, CapGemini/Efma, 2015.

Figure 13

Positive experience levels by distribution channel and region, life insurance 2014



Source: 2015 World Insurance Report, CapGemini/Efma, 2015.

Selling life insurance can be a challenging business.

New technologies can facilitate consumer engagement with life insurance, for instance by making the application process easier.

Associating positive emotions with the purchase of a life insurance policy

Selling life insurance can be challenging given the complex nature of some of the products and lengthy underwriting procedures, often involving medical assessment. According to a recent study in Europe, many people do have a good understanding of the risks they face in their lives, but this does not make them more likely to buy insurance products to mitigate those risks.⁴⁸

One way to extend the reach of life insurance is to make the buying process easier, and here technology can help. For example, the application process for simple term life cover typically takes several weeks, involves a personal meeting or phone conversation with an agent, a medical assessment and extensive paper work. Some insurers are trying to change that. For example, Haven Life, a start-up fully-owned by MassMutual, offers a first-fully underwritten term life product online. The application procedure takes just 20 minutes of a consumer’s time. The website also offers a financial needs calculator, and preliminary coverage may start immediately. Applicants still have to go through a medical examination, but they have 90 days to so and are covered during that time. Making the policy simpler, cheaper and using plain language to describe coverage are also important considerations.

⁴⁸ European Insurance Report 2015, Next Generation Insurance, Swiss Re, 2015.

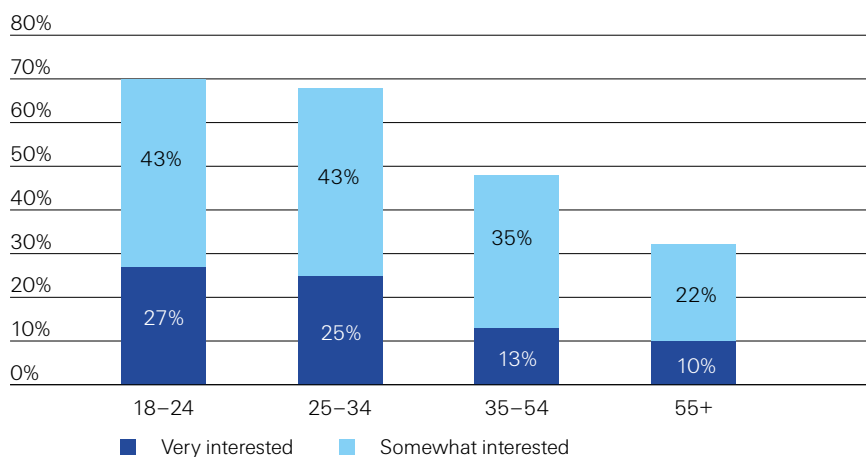
Gamification can also help capture consumer engagement.

A technique increasingly used by life insurers to engage customers is “gamification”. This is the use of game thinking and mechanics in a non-game environment to increase customer engagement and stimulate desired behaviour through challenges, incentives and rewards.⁴⁹ For instance US insurer CUNA Mutual Group has developed various apps designed to engage members in the complex process of retirement planning and product choice. “The Zone” is an iPad application that helps financial advisors sell a complex annuity product by visualising the risks and benefits of different product features and by increasing client engagement in the advisory process.⁵⁰ The app appeals to a younger customer base when applied in the right context and with appropriate advisory services. As Figure 14 demonstrates, there is significant potential interest, particularly among younger people, in games and apps that can help them better understand their risks and insurance needs.

Figure 14

Consumer interest in gamification, life insurance.

Survey question: Would you be interested in a computer game that your insurance provider offered to help you better manage the risks you face and to optimize your insurance premiums?



Source: Accenture Consumer-Driven Innovation Survey: *Playing to Win*, Accenture, 2013.

New sources of data offer opportunities for more granular client segmentation.

Big data offers new opportunities for customer segmentation

Marketing of insurance has traditionally relied heavily on fairly basic approaches to customer segmentation, ie, aggregating prospective buyers into groups (segments) likely to have common needs and respond similarly to marketing. Typical customer attributes include geography, demographics, psychographics (eg, values, attitudes, lifestyles) and behavioural aspects (eg, price sensitivity). The disadvantage of this approach is that the groups are relatively broad, which can hinder effective targeting of consumers. In the age of Big Data, many new data types are available, which can be combined and analysed to define a more granular classification of existing and prospective customers. These new data types include website tracking information, purchase histories, call centre and customer service records, data from mobile phones and wearables and also social network profiles.

⁴⁹ *Digital Insurance Benchmark*, Deloitte, 2014.

⁵⁰ See for example: K. Burger, “From Feeling Processed to Feeling Valued”, *Insurance & Technology*, June 2014, pp 4–6.

Predictive modelling techniques may help insurers better identify their clients' needs.

Mobile technology offers the potential to reach new customer segments, particularly in emerging markets.

Life insurers need to have a more interactive relationship with their customers. Access to customer data can help them do so.

Some insurers try to increase customer engagement with reward programmes.

The US mutual insurance and financial services company USAA is among the leaders in leveraging its vast member database to make personalised offers. The company, whose members are active or former members of the US military, has recently entered a partnership with Saffron, a California-based technology company, to come up with an algorithm that anticipates members' upcoming needs for financial products. It is based on predictive modelling techniques and allows USAA to determine the right product offer at the right time. Data analysed include demographic attributes, history of purchases of insurance and other financial products, channel preferences, records from call centres, website tracking information and use of mobile applications etc. According to the company, Saffron's product recommendations resulted in over a 50% lift in predictive performance over other methods previously applied.⁵¹

In addition to better targeting the existing customer base, new technologies also offer the potential to reach new customer segments. In emerging markets, the distribution of insurance via mobile devices has grown exponentially over the last decade, supported by the rapid spread of mobile phone use.⁵² The two largest companies dedicated solely to mobile insurance distribution, MicroEnsure and Bima, have already reached 15 million and 13 million people, respectively. Starting in Sub-Saharan Africa, which has been at the forefront of mobile insurance distribution, they have moved rapidly into new markets in Asia and Latin America. Much of the recent expansion of mobile distribution in emerging markets has relied on the rapid growth of third-party technology service providers which have essentially taken over insurance functions such as product design, underwriting, policy administration and claims.⁵³ The downside for insurers is that they do not have direct access to their customers and are used mainly for licensing and capital requirements.

Improving customer retention by increasing engagement

Currently, the completion of a life insurance sale often marks the end of customer interaction in many distribution models, with the remaining interaction focused on billing and claims handling. However, this kind of relationship misses opportunities for insurers to address the full range of customer needs over their lifetime. Customer relationships need to become more interactive after signing of the contract, and not only in the case of there being a claim. Frequent access to the customer and their data provides insurers and intermediaries with the opportunity to spot evolving needs.

Technology can facilitate new ways of interaction. For example, some life insurers are engage customers through programmes that reward them for healthy lifestyle activities and choices, such as exercising, regular check-ups and giving up smoking. The Vitality programme, developed by South African insurer Discovery has been a leading example of how to retain customers by keeping them engaged (see Box: Vitality reward programme).

⁵¹ "USAA and Saffron to Speak at Wharton's Customer Analytics Conference", *reuters.com*, 28 April 2015, <http://www.reuters.com/article/2015/04/28/idUSnMKWdJPM7a+1dc+MKW20150428>

⁵² Mobile subscriptions worldwide increased from less than 1 billion in 2000 to over 6 billion in 2011, of which nearly 5 billion in emerging markets. See: *Information and Communications for Development 2012: Maximizing Mobile*, The World Bank, 2012.

⁵³ For details, see *Mobile insurance distribution in emerging markets: African innovations spreading globally*, November 2015, Swiss Re.

Vitality reward programme

Vitality has a rewards programme to engage their customers.

Vitality is a reward programme developed by South African insurer Discovery and launched in 1997. The programme encourages consumers to engage in healthy activities such as exercising, stopping smoking and having regular medical check-ups. In return, they gain Vitality points which can be redeemed for different benefits. Those may include discounts on gym membership, healthy food purchases, flights and hotels, and store vouchers and cinema tickets. Active clients may also benefit from premium reductions. But the key is that more engaged healthy customers keep their policies for longer, a positive influence on portfolio profitability for the insurer.

Various studies found beneficial impacts of Vitality's programme.

In 2004, Discovery entered a joint venture with Prudential UK to create PruHealth and PruProtect to expand its business and the Vitality programme in the UK. In 2010, it partnered with Chinese insurer Ping An, before launching in eight Asian countries together with AIA, the pan-Asian life insurance group, in 2013. And in 2015, Vitality expanded to the US by entering into a partnership with John Hancock. Various studies have examined the health outcomes of Vitality programme participation. One study showed that rebates of 10% and 25% for healthy foods are associated with an increase in the ratio of healthy to total food expenditure by 6% and 9.3%, respectively.⁵⁴ Another found that those participating in Vitality's incentive-based wellness programme had lower health care costs.⁵⁵ However, client involvement in fitness-related activities is generally low. Whereas about a quarter of all Vitality members in the UK engaged in online activities such as completing health and wellness surveys, only about 8% had active gym memberships and less than 3% engaged in other physical activities in 2013.⁵⁶

The client-loyalty programme aims to improve policyholders' health and claims experience.

Vitality aims to improve policyholders' health and persistency behaviour as well as claims experience. They now use Fitbits in their programmes to motivate members to stay active. Note, however, that policyholders still have to go through a traditional underwriting assessment. As such, the programme is predominantly a client loyalty programme rather than being part of Discovery's underwriting process.

As customers become better informed, the role of intermediaries will need to evolve.

The changing role of insurance intermediaries

With the huge amount of information available on the internet, customers are increasingly well-informed about insurance offers from different providers. As they also (slowly) become more comfortable with buying insurance online, the role of life insurance intermediaries will need to evolve.

Advisors will continue to play an important role, particularly in the distribution of more complex products.

Independent advisors have traditionally provided guidance to consumers around choice of life insurance provider and product. They will likely continue to do so, particularly for the purchase of more complex products, since customers still derive value from their advice and expertise. Even in the case of more standardised products, some clients will prefer personal interaction over online market research, but this is likely to become more the exception than the rule.

⁵⁴ R. Sturm, R. An, D. Segal and D. Patel, "A Cash-Back Rebate Program for Healthy Food Purchases in South Africa, Results from Scanner Data", *American Journal of Preventive Medicine*, vol 44, no 6 2013, pp 567-572.

⁵⁵ D. Patel, E. Lambert et. al., "The Association between Medical Costs and Participation in the Vitality Health Promotion Program among 948,974 Members of a South African Health Insurance Company", *American Journal of Health Promotion*, vol 24, no 3 2010, pp 199-204.

⁵⁶ These results refer to activities within one month after policy inception from March to June 2013. See N. Read, *Vitality – Managing Risk through the Use of Incentives*, The Geneva Association, November 2014, https://www.genevaassociation.org/media/908577/ga_11th_healthageing_conference_read.pdf

Digital technology allows for integration of underwriting and sales processes.

By taking advantage of digital technology, independent advisors can combine the advantages of automation and personalised advice. The life insurance industry has put a lot of effort into automating the underwriting process. For example, Swiss Re's automated underwriting system "Magnum" allows for an efficient underwriting and improved customer experience at the point of sale.⁵⁷ In addition, other applications have been developed that allow independent agents to enter client risk parameters into a single system, get a binding quote from several insurers and conclude the transaction immediately.⁵⁸ This removes the need for advisors to base their assessment on preliminary quotes, deal with several different entry forms and to get binding quotes from different insurers. Streamlining data collection and accelerating the underwriting process helps avoid interruptions and is likely to increase the number of transactions that reach the closing stage. Technology can be used to furnish agents with all the data they need to make the next sale.

Intermediaries also offer additional services to their clients.

To maintain their *raison d'être*, some intermediaries are providing additional services to customers. For example, Swiss start-up company "Knip" has launched a mobile app that allows customers to store all their insurance policies in digital format. Besides providing a convenient overview of all insurance contracts in one app, the service allows for changing, cancelling and buying new policies as well as reporting claims via the app. Knip acts as an insurance broker and receives management fees and commissions from insurance companies.⁵⁹

Rethinking compensation structures may help alleviate conflicts between traditional and digital channels.

The increasing use of multiple distribution channels and the potential for conflicts this may cause may lead insurers and agents to rethink their traditional cooperation models, including how intermediaries are compensated. For example, a client acquired online may require advice from an agent. A compensation model that rewards agents for these services via advisory fees that consumers are willing to pay may help alleviate channel conflicts that could arise within a pure commissions-based system.

⁵⁷ Magnum is Swiss Re's automated underwriting solution designed specifically for the underwriting of life and health insurance. It includes an innovative underwriting app for mobile devices. Many applications are accepted automatically with concise, relevant customer information, making Magnum Mobile straightforward for the agent and the consumer.

⁵⁸ Examples include: "UnderwriteMe", "vers.diagnose" and "EQuot".

⁵⁹ "Swiss Mobile-First Insurance Broker Knip Picks Up \$15.7M Series B", *techcrunch.com*, 26 October 2015, <http://techcrunch.com/2015/10/26/knip/>

Strategic implications

Insurers will need new business models, and greater investment in technology and talent management.

Technology could spur new directions for insurers, from specialisation or pure digital to the provision of additional, non-traditional services.

Technology can unbundle the value chain in insurance.

Another option is to create a purely digital business with completely new systems in a standalone subsidiary...

... but this can result in management challenges, channel conflicts, and cross-selling difficulties.

Insurers could offer non-traditional, complementary services.

Technology and the digital data revolution will fundamentally change the business of insurance. The challenge for insurers will be to optimise their data management capabilities and practices to best engage consumers. To grow their business, they will need to adapt their operating models, review their investments in technology, and rethink their talent strategy.

Potential new business models

New technologies and digital data provide insurers with an opportunity to consider new operating models. The options include:

- To specialise in a part of the insurance value chain;
- To create a fully digital platform for the whole value chain; and
- Provide non-traditional services as part of the insurance package.

Technology can unbundle the value chain so that insurers can provide one, some or all of product, underwriting and claims services. Some insurers already offer “white-labelled” products in specific segments only.⁶⁰ This can appeal to firms wanting to specialise in certain parts of the value chain or a market segment such as, for example, insurers with strong underwriting but weak distribution capabilities.

Having a digital-only brand is also a possibility. Traditional insurers wanting to transition from their brick-and-mortar world find it difficult to jettison legacy systems, adopt completely new ones, and attract tech-savvy talent. One way to deal with this is to establish an independent, self-managed digital business with full P&L responsibility. Some insurers have done this. For example, since 2010 Sumitomo Life has run a subsidiary offering medical insurance internet products,⁶¹ and in 2013 Kyobo Life launched Kyobo Lifeplanet as a standalone no-frills brand.⁶²

A management challenge here is to allow the independent business to run itself, effectively as a start-up, and to avoid the temptation of subjecting it to the bureaucracy of the legacy business, or take it back in-house too soon. Also, while a standalone digital business is easier to manage from an insurer’s point of view, there can be channel conflicts and difficulty in upselling traditional products to policyholders as they age. Finally, there is some evidence that customers desire both digital and physical interaction especially for complex products like life insurance. Bain & Company found that customers who use both digital and physical channels assign insurers a much higher “net promoter score” than do customers who use only digital channels.⁶³

Insurers can also use technology to offer services outside the bounds of traditional insurance. Some life insurers already offer health screenings, preventative consultations, discount cards to pharmacies and other types of assistance, positioning themselves to provide family, health and wealth services to consumers. Figure 15 depicts a range of a brave new world of services that sophisticated technology platforms could open up to insurers.

⁶⁰ “White labelling refers to the provision of product, underwriting and claims through an independent distribution channel. For an example, see “U for Life launches industry’s first online life insurance platform”, *theSundaily.my*, 7 May 2015, <http://www.thesundaily.my/news/1410755>

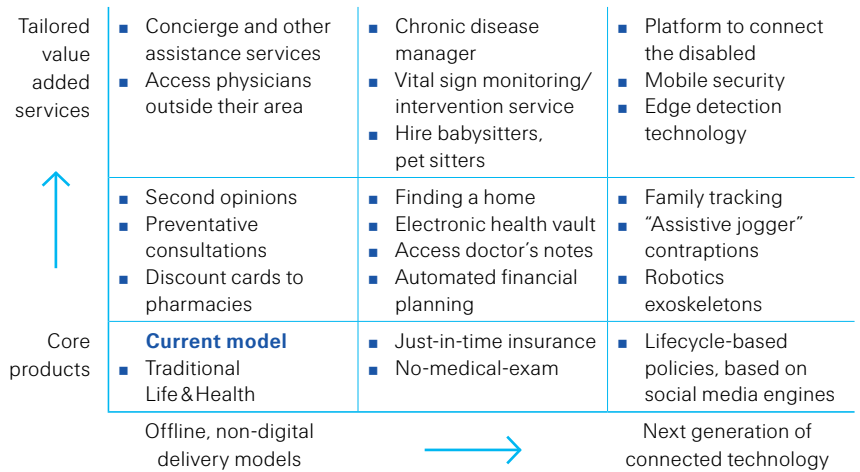
⁶¹ *Annual Report*, Sumitomo Life, 2014, p 21.

⁶² “Korea’s First Internet-only Life Insurer to Begin Business in December”, *The Korea Economic Daily*, 31 October 2013,

<http://english.hankyung.com/news/apps/news.view?c1=02&newsdate=1&nkey=201310311224381>.

⁶³ *Leading a Digital® transformation in insurance*, Bain & Company, 2014.

Figure 15
Possible tech-enabled product and service offerings open to insurers



Source: Swiss Re Economic Research & Consulting.

Artificial intelligence technology can be used to provide automated yet personalised client services

Artificial intelligence can enable and enhance the new possibilities, such as the provision of personalised client services. For example in 2014, USAA launched a pilot using Watson's cognitive computing platform to advise US military personnel on a range of decisions, including job searches, moving, insurance benefits and support when they transition to civilian life. The service was initially web-based and required members to type in their questions. But as AI and voice recognition improves, members may eventually be able to have a conversation with a digital agent.⁶⁴

A wide range of services could be provided as part of the overall insurance package.

Insurers can enable access to newer-age technologies, such as platforms for on-demand access to healthcare and consultations with licensed health practitioners.⁶⁵ They could explore home mobility services linked to robotics and similar capabilities. Exoskeletons – wearable robotic devices that enable individuals with injuries (eg, spinal cord damage) to stand upright, walk, turn, and climb and descend stairs – several of which are being built today, could be part of a service allowing people to have a higher quality of life as they age or become disabled. A device offered by start-up ReWalk is now beginning to be covered by insurers, and hopefully can help injured workers return to gainful employment.⁶⁶ Insurers can also consider partnerships to offer senior care products like edge detection technology (imaging technology that helps spot home hazards, eg, steps, sharp-corner tables, etc.), indoor navigation, technological mattress pads, and hip protection.⁶⁷

These new services would need to be monetised.

Insurers are still exploring how to monetise these interactions and recover the cost of services, especially in price-sensitive markets. One option is revenue sharing arrangements with external partners who bundle their offerings with traditional insurance services. Another is to work with employers, since they typically have deeper pockets. For example, Grand Rounds, a Big Data doctor-matching service found that employers were open to pay for the service after they found that

⁶⁴ USAA and IBM Join Forces to Serve Military Members, IBM, 23 July 2014, <http://www-03.ibm.com/press/us/en/pressrelease/44431.wss>

⁶⁵ On-demand access platforms include Doctor on Demand, HealthTap, First Opinion, Talkspace. Other services include wearable headsets that slow the effects of Alzheimer's, and helping people who lose muscle control use connected products at home through brain commands (developed by Emotiv and Philips; see <http://www.usa.philips.com/healthcare/innovation/research-and-exploration/als-mind-control>).

⁶⁶ E. Micucci, "Commercial insurance begins for ReWalk", *WBJournal.com*, 23 July 2015, <http://www.wbjournal.com/article/20150723/METROWEST01/150729971/commercial-insurance-begins-for-rewalk-with-spaulding-patient>

⁶⁷ C. Tuohy, "How technology can keep grandma out of the nursing home", *insuranceneedsnet.com*, 15 June 2015, <http://insuranceneedsnet.com/inarticle/2015/06/15/how-technology-can-keep-grandma-out-of-the-nursing-home.html>

Strategic implications

For starters, life insurers need to reconfigure their traditional IT architecture ...

... to enable a single and centralised view of the consumer across all touch points in the insurance value chain.

Getting to the single view from existing disparate data sources and repositories is no mean feat.

better-chosen treatments often save money.⁶⁸ In some cases the cost of implementation could be offset by lower insurer pay-outs, as a US Senate hearing in 2015 on the use of technology in aging heard. At the hearing, a participant estimated that he saved USD 327 000 on nursing home and health aide services for his 76-year old mother-in-law over a two-and-a-half year period. He did so by wiring her home for an installation cost of USD 2 189 and a monthly fee of USD 59.⁶⁹

Next generation of IT platforms

The digital age will necessitate a new view of IT architecture. Life insurers need to build capability to seamlessly bundle products and services, and deliver them through a multi-channel front-end that offers a single view of the customer and of his/her experience across all touch points in the insurance value chain. An integration engine should be able to view the customer as a “cluster of one” and assess what combination of products and services to pitch. Ideally, new predictive models can be built to advise on products to pitch and even be refined automatically. Such technology is already being developed by start-ups, some of which have the financial backing of large insurance players.⁷⁰

Insurers should also create a layer where a centralised view of the data is stored. The data could come from customer’s records available in the policy administration system, social media and digital footprints, recent purchases, GPS navigation, data on likes, dislikes and events planned etc. The data will need to be analysed as it streams in to generate inferences about new selling opportunities. The systems should also be capable of dealing with new data types from social media, blogs, videos, audios and location apps.

Harmonising data from disparate data sources has proven challenging. Life insurers have long been trying to create a single and complete 360° view of the customer, updated in real time.⁷¹ According to research from SMA, 35% of insurers say they have assembled that view, but only 8% can present it in real-time to the individuals interacting with a policyholder. Almost half (46% of insurers) do not yet have the single view.⁷² Some insurers are working with established technology vendors to build that capability, while others have joined forces with start-ups focussed on data harmonisation and platforms that use AI to attempt to do so.⁷³ Incidentally, insurers have also struggled with creating a complete, master version of customers’ contact information, and are looking for innovative solutions to this challenge too.⁷⁴

⁶⁸ J. Tozzi, “Start-ups that give you a second opinion on costly-surgery”, *Bloomberg*, 20 August 2015. <http://www.bloomberg.com/news/articles/2015-08-20/the-startups-that-give-you-a-second-opinion-on-costly-surgery>

⁶⁹ C. Tuohy op. cit.

⁷⁰ For example, New York Life has invested in a start-up that is automating predictive model creation. “Context Relevant Announces \$13.5 Million in Series B-1 Funding”, *Business Wire*, 25 September 2014, <http://www.businesswire.com/news/home/20140925006190/en/Context-Relevant-Announces-13.5-Million-Series-B-1>. TransAmerica has invested in Oxdata whose product, H2O.ai, is an open source predictive analytics platform for data scientists. *Oxdata is now H2O.ai, Announces Production Customers including PayPal, Nielsen, and Cisco*, H2O.ai, 17 November 2014, <http://h2o.ai/news/2014-11-17-Press-Release/>

⁷¹ The 360° view of a customer is obtained by aggregating data from the various touch points that a customer may use to contact the insurer, not just to purchase policies but also to ask for service and support.

⁷² M. Breeding, “Single View and the Customer Experience in Insurance”, *strategymeetsaction.com*, 9 June 2015, <https://strategymeetsaction.com/news-and-events/sma-blog/single-view-and-the-customer-experience-in-insurance/>

⁷³ For example, Tamr, a start-up in which MassMutual is an investor, aims for a unified view of the customer by helping unify siloed, fragmented databases across the firm. See *Tamr Receives \$25.2 Million in Financing from Hewlett Packard Ventures, Thomson Reuters, MassMutual Ventures and Others*, Tamr, 19 June 2015, <http://www.tamr.com/tamr-receives-25-2-million-in-financing-from-hewlett-packard-ventures-thomson-reuters-massmutual-ventures-and-others/>

⁷⁴ For example, AXA has invested in Evercontact, a fully-automated cloud service that finds and updates contact information irrespective of which channel it came from. It discovers missing contacts in emails, allows them to be shared with collaborators and keeps CRMs and address books automatically up to date. See *AXA Strategic Ventures invests in Evercontact*, AXA, 8 April 2015, <http://www.axa.com/en/news/2015/axa-strategic-ventures-invests-in-evercontact.aspx>

Some life insurers are partnering with start-ups to build their own data analytics and technology capabilities.

Table 1

Active venture investors in insurance technology enterprises

Insurers as venture investors in Fin-Tech start-ups

To leverage innovation, insurers' IT departments will need to acquire adaptive sourcing skills. Procurement teams have traditionally worked with a few well-known vendors, and have little experience of working with specialist start-ups. Some life insurers have begun exploring partnerships with smaller technology companies. Table 1 has some early examples of insurers partnering with – acquiring or investing in – such start-ups that could help them lead their own digital transformation.⁷⁵

Theme	Insurers and start-ups
Financing and investing platforms	<ul style="list-style-type: none"> ■ USAA: Personal Capital, Coinbase, Prosper Marketplace ■ Ping An: e-Toro, Payoneer, Lufax ■ Axa: Widmee, Particeep, Fund Shop ■ TransAmerica: Auxmoney, Next Capital ■ MassMutual: IEX Group ■ NorthWestern Mutual: Betterment, LearnVest
Next generation customer experience	<ul style="list-style-type: none"> ■ American Family: Image Vision, Mobile Igniter, Shoutlet, Quietyme, Review Trackers, Moot Labs, Networked Insights ■ USAA: Expect Labs, Narrative Science, CafeX, Saffron Tech, MX Tech ■ Axa: Volunteer Spot, Evercontact ■ MassMutual: Tamr
Value added services	<ul style="list-style-type: none"> ■ American Family: Abodo, Life360 ■ USAA: Vast, Care.com, Cartera Commerce ■ Ping An: Trafree, Mogoroom ■ Axa: Easy Propreitaire, FLYR
Threat identification, data science, security	<ul style="list-style-type: none"> ■ American Family: XOR Data, Airphrame, Wireless Registry, Zero Locus ■ USAA: ID.me ■ Axa: Climate Secure ■ TransAmerica: CipherCloud, H2O.ai ■ MassMutual: Recorded Future, Context Relevant ■ New York Life: Skycure, ■ AIG: K2 Intelligence, Algebraix Data
Health technologies	<ul style="list-style-type: none"> ■ Ping An: JMDNA, HealthcareCN, Rainbow Medical ■ Axa: Limelight Health ■ MassMutual: Picwell

Source: CB Insights, Swiss Re Economic Research & Consulting.

There is competition for buying innovative risk-management start-ups.

Sometimes non-insurance companies buy start-ups that could potentially be useful to insurers. For example in 2013 Climate Corp, a start-up focused on weather risk, was bought not by a large P&C insurer, but by the agricultural solutions company Monsanto, for USD 930 million.⁷⁶

⁷⁵ For more insight on investors in the insurance tech market, see "Insurance-Tech Start-ups Are Invading The Multi-Trillion Dollar Insurance Industry", *CB Insights*, 5 June 2015, <https://www.cbinsights.com/blog/insurance-tech-startups-investment-growth/>

⁷⁶ *Monsanto to Acquire The Climate Corporation*, Monsanto, 2 October 2013, <http://news.monsanto.com/press-release/corporate/monsanto-acquire-climate-corporation-combination-provide-farmers-broad-suite>. Subsequently in July 2015, Monsanto decided to focus only on the digital agriculture platform and sold the agriculture insurance business of Climate Corp. to AmTrust Financial. See *The Climate Corp. Sells Crop Insurance Business to AmTrust Financial Services*, Monsanto, 31 July 2015, <http://news.monsanto.com/press-release/climate/climate-corporation-sells-crop-insurance-business-amtrust-financial-services-i>

Strategic implications

Many life insurance companies are hiring Chief Digital Officers.

The industry needs to rebrand to be seen as an employer of choice for young engineering talent.

It also needs to develop a pipeline of talent in other specialist areas.

Insurers are setting up innovation labs, and developing fast-fast iterative approaches to innovation.

New talent strategies to embrace technology innovation

Attracting and retaining talent is key to the success of a technology-driven strategy. Some insurers have placed certain human resources responsibilities in the hands of individual business units, and others have centralised the function with Chief Information Officers (CIO) or Chief Digital Officers (CDO). According to a Gartner survey, 9% of insurers already have a CDO,⁷⁷ tasked with developing a strategic vision of how technology will transform the business. The strategy may include the creation of an open-innovation environment through collaborating with research institutions and technology vendors.

Insurers need to rebrand themselves as technology employers of choice, especially for the younger generation. IT graduates may hesitate to join insurers heavily dependent on mainframe-based applications written with older programming languages. Thus, partnering or buying more tech-savvy companies may be a necessary part of a new strategy. Insurers also need industry experts who can translate technology into effective use across the insurance value chain and this may need to be developed in-house.

Developing a future talent pool with skills in "people-centered design process"⁷⁸, data science and start-up engagement, is also critical. Insurers like AXA have set up accelerator programs to attract entrepreneurs with interesting ideas.⁷⁹ Aviva⁸⁰ and Allianz⁸¹ run "hackathon" events to attract technology talent to insurance-specific issues. And MassMutual partners with colleges, hoping to attract graduates with an affinity for data science.⁸²

Insurers are bringing talent into innovation labs and internal A-teams that operate outside the four walls of day-to-day business. The aim is to enable new thinking, while allowing for the luxury of failure. The team members could come from other industries where innovation is a pre-requisite, so as to be unimpeded by traditional insurance industry thinking and problem solving. Some insurers have taken the first steps in this direction. Aviva built its first digital garage in London in 2014, and has brought the idea to Asia.⁸³ This year MetLife set up a disruptive innovation lab, also in Singapore, to create new business models in health, wealth and retirement services.⁸⁴

⁷⁷ *Taming the Digital Dragon: The 2014 CIO Agenda*, Gartner, 2014, p 5. https://www.gartner.com/imagesrv/cio/pdf/cio_agenda_insights2014.pdf

⁷⁸ This is a term used by Gartner. See <http://www.gartner.com/smarterwithgartner/digital-humanisms-impact-on-customer-experience/>

⁷⁹ *AXA Launches Venture Capital Fund to Foster Entrepreneurial Discovery in Insurance and Financial Services, Improve Customer Experience*, AXA, 25 February 2015, <https://us.axa.com/news/2015/axa-announces-venture-capital-fund-launch.html>

⁸⁰ See Aviva website: <http://www.aviva.co.uk/innovation/>

⁸¹ See Allianz Hack Risk app webpage: <http://hackrisk.bemyapp.com>

⁸² Nathan Golia, "How MassMutual Builds a Data Science Pipeline", *insurancetech.com*, 23 October 2014, <http://www.insurancetech.com/data-and-analytics/how-massmutual-builds-a-data-science-pipeline/d/d-id/1316902>

⁸³ *Aviva announces 'Digital Garage' in Singapore*, Aviva, 27 July 2015, <http://www.aviva.com/media/news/item/aviva-announces-digital-garage-in-singapore-17510/>

⁸⁴ "MetLife Launches LumenLab – the First-of-its-Kind Innovation Centre in Singapore, for the Life Insurance Industry in Asia", *businesswire.com*, 16 July 2015, <http://www.businesswire.com/news/home/20150716005707/en/MetLife-Launches-LumenLab---First-of-its-Kind-Innovation-Centre>

New challenges

The new technology and data analytics also present challenges as well as opportunities.

A main challenge is data protection and privacy and, to date, differing national regulation in this area.

Things are changing with the development of data privacy laws in many countries, although these still vary widely in scope.

New technology presents challenges as well as opportunities. First, there are issues around data protection and privacy and how this is regulated. Second, insurers could collaborate with, or face competition from non-traditional players (NTPs).

Using data responsibly

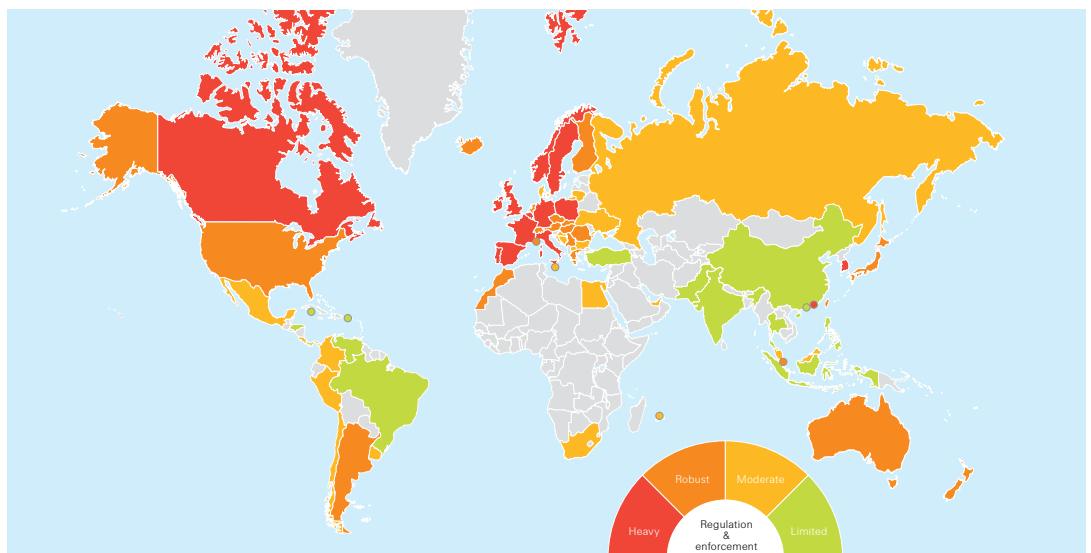
Data protection and privacy

In monetising the potential of digital technology, life insurers could have problems from data protection and privacy, cyber security, fraud, records retention and authentication. Personal data collected by third parties such as data aggregators and retailers has been mined for commercial purposes for many years. This has been an accepted practice in many industries, but not so far by life insurers. Even though there are no existing legal restrictions, life insurers have been reluctant to utilise these data because of ethical concerns that its use could be viewed as overly invasive and thus pose a reputational risk.⁸⁵ In the absence of regulatory guidance on data privacy in the digital age, this cautious approach has been prudent.

However, new regulations are being developed in most countries. At the beginning of 2015, 109 countries had data privacy laws and, for the first time, most of those countries (56) were outside Europe.⁸⁶ The scope of national laws, however, differ considerably (see Figure 16).⁸⁷ There is a difference in the understanding of data privacy and the duration that the data should be stored. In the EU, for example, citizens have the right to be forgotten, a new concept for US and Asian insurers. The differences raise complications, because of the lack of international standards on consistent use and reporting of data by life insurers operating in different countries.

Figure 16

Overview of data protection laws of the world



Source: *Data Protection Laws of the World Handbook*, DLA Piper, 2015.

⁸⁵ Consumer reactions to commercial use of personal data are not uncommon. Target, one of the largest retailers in the US, quickly discovered that practices in full compliance with all privacy laws can make consumers queasy. See "How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did", *Forbes*, 16 February 2012, <http://www.forbes.com/sites/kashmirhill/2012/02/16/how-target-figured-out-a-teen-girl-was-pregnant-before-her-father-did/>

⁸⁶ G. Greenleaf, *Global Data Privacy Laws 2015: 109 Countries, with European Laws Now a Minority*, University of New South Wales, Faculty of Law, Report, 30 January 2015 available from Social Science Research Network website, <http://ssrn.com/abstract=2603529>

⁸⁷ Regulatory developments in the field of data protection are dynamic. Contact DLA Piper (dataprivacy@dlapiper.com) for the most updated version of the data protection regulation map.

New challenges

There are a number of other privacy issues, such as the clash between the Big Data mind set and the traditional principle of data minimisation.

Further, regulations around pseudonymisation are set to be tightened up...

.. and insurers may need consent from policyholders to use data before performing an analysis.

Insurers are grappling with a number of other data privacy challenges (see Table 2). The first is a clash with the principle of data minimisation. Rather than store limited amounts of internal structured data, Big Data research requires firms to store as much data as they can. It is hard to apply data protection laws without knowing the nature of the data being stored and how it originated. A further issue is that an industry that has prided itself on working primarily with high-quality data is now drawing conclusions from models built on messy data.

The EU General Data Protection Regulation, expected to be published in 2016, may have a stricter regulation on the use of "pseudonymised" data. Pseudonymisation means replacing one or a few attributes (eg, name) by another value (eg, randomly generated number). Anonymisation means transforming personal information into data that can no longer be used to identify a person. Despite pseudonymisation, the person may be able to be identified through leveraging other information. Anonymisation is meant to be more secure.

Insurers often pseudonymise data by replacing the name of the policyholder with a number for certain types of trend analysis. In its current form, the Data Protection Regulation is very restrictive on the use of pseudonymisation and insurers may need to carry out the onerous task of reaching out to individual policyholders for consent to use data before performing an analysis.⁸⁸ Finally, as insurers' share and purchase data from external providers, they will find it difficult to track how and why the data was originally collected. This information may not even be known to the data provider.

Table 2
Changing worldviews on data collection

Shift in data initiatives		Challenges faced by insurers
Old world	New world	
Data minimisation	Big Data (as much as possible)	Fundamental tension on central data protection tenet that data collection must be minimised.
Causation	Correlation	Shift from rigid principle of causation to correlation. Accuracy was key, now conclusions from messy data.
Anonymisation	Pseudonymisation	Re-identification risk. EU directive could restrict pseudonymisation; need to ask for consent.
Data collection	Data sharing	Challenges the principles of purpose limitation and transparency.

Source: Swiss Re Economic Research & Consulting.

⁸⁸ *Caution, Data Protection!*, Topics Magazine Issue 1/2015, Munich Re, 2015.

Unsolicited, personalised offers of insurance are not always welcome.

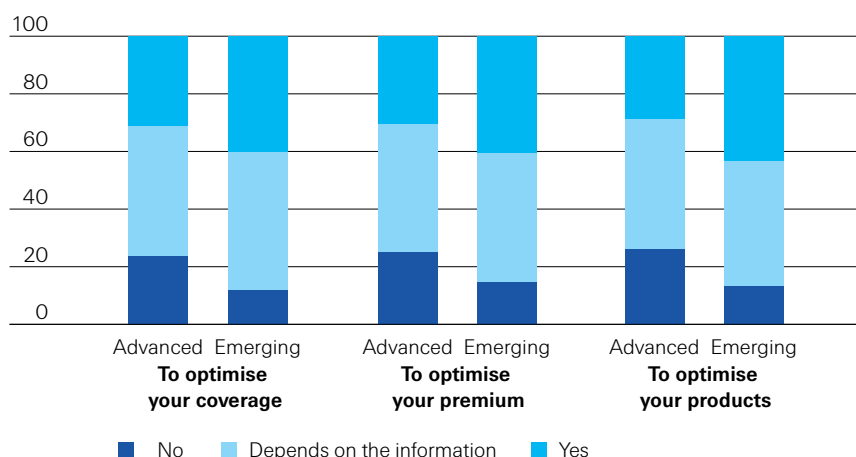
Keeping consumers inside

Also, life insurers will not want to alienate consumers through their use of technology and data analytics. For example, in some countries, people may be uncomfortable with insurers using information about them stored in the digital universe to formulate and make unsolicited and personalised offers for coverage. This seems to be more the case in developed countries than in the emerging markets. As Figure 17 shows, a 2013 survey by Accenture revealed that life insurance consumers in emerging markets (China, Brazil and South Africa) were less hesitant than those in developed markets to share usage and behaviour data with insurers in return for more optimised coverage, pricing and personalised products.⁸⁹

Figure 17

Consumers comfort with insurers access to information on usage/ behaviour

Survey question: Would you be comfortable for your insurance provider to access information on your usage/ behaviour in order to optimise your insurance coverage & premium, as well as offer you more personalised products?



Source: Accenture Consumer-Driven Innovation Survey: Playing to Win, Accenture, 2013, Swiss Re Economic Research & Consulting.

Regulators have raised a number of concerns about digitally sold life insurance products.

Digital distribution and regulatory concerns

Insurers will need to monitor regulatory concerns around digital distribution, especially as the industry is still dealing with issues around mis-selling of life policies and inadequate advice. For instance, in an opinion paper this year, the European Insurance and Occupational Pensions Authority (EIOPA) said that with respect to sales via the internet of insurance and pension products, "sufficient advice is not always provided or the information displayed is not fair enough."⁹⁰ The EIOPA also observed that consumers may choose an insurance policy based solely on the price offered, rather than on material differences in quality. An additional concern is that consumers may inadvertently enter into unsolicited contracts, given the various options and tick-box fields that they need to complete. Finally, it could be difficult for regulators to monitor digital transactions in real time and gather the necessary information to fulfil their supervisory tasks at the national level.

⁸⁹ Accenture interviewed 6 135 insurance policyholders across 11 countries in July 2013, in the automotive, home and life sectors. The data in Figure 17 is sourced from life insurance consumer responses to Question 18 in Accenture's survey, ie, "Would you be comfortable for your insurance provider to access information on your usage/ behaviour in order to optimize your insurance coverage & insurance premium, as well as offer you more personalized products?" See *Accenture Consumer-Driven Innovation Survey: Playing to Win*, Accenture, 2013, <https://www.accenture.com/us-en/consumerdriveninnovation.aspx>

⁹⁰ *EIOPA Opinion on sales via the Internet of insurance and pension products*, European Insurance and Occupational Pensions Authority, BoS-14/198, 28 January 2015.

New challenges

There could be also be regulatory grey areas with respect to cross-border sales.

Insurers may also need to keep abreast of regulations with respect to the use of technology in cross-border transactions. Cross-border selling is becoming easier with new technology but there could be physical restrictions, such as a requirement to have customers sign a policy in person rather than by e-signatures. Also, insurers may not be allowed to store certain types of data in locations outside their home jurisdictions. This could be a rising concern in the age of cloud computing: where exactly does the cloud sit?

Insurers will need to fit cloud usage into their technology strategy, for data from, for example, wearables.

Broader cyber risks

Currently, the cloud is not a big part of insurers' technology strategy because of security issues with cloud usage. However, much of the data generated from wearables, for example, will be stored in the cloud. To utilise cloud-stored data, insurers will either need to adapt their technology strategies to accept a higher risk threshold or formulate more secure ways of accessing/storing/using the data.

Insurers are developing social listening skills to manage reputational risk on social media ...

Additionally, customers often depend on the wisdom of the many rather than that of experts. To manage this risk, insurers can develop social listening tools and use platforms that offer peer-to-peer understanding of how they have fared. For example in the US, American Family has invested in ReviewTrackers, a software that helps manage customer online reviews. It tracks, generates and analyses consumer-generated reviews on all major review sites, enabling insurers to listen closely and respond promptly to what their customers are saying online.⁹¹

... and security strategies for the BYOD devices that employees favour. .

As smartphones and tablets find widespread use among employees and agents, they become more vulnerable to cyberattacks. An additional risk comes with the bring-your-own-device (BYOD) movement, whereby employees are permitted to use their own devices for business purposes, alongside usage for private matters. Life insurers need to closely monitor the risks posed by these devices without compromising device performance in the field. One example is New York Life which is partnering with an Israeli mobile threat defence start-up, Skycure, to provide protection for its 35 000 mobile devices. Skycure leverages massive amounts of crowd data to help prevent or mitigate attacks on mobile devices.⁹²

⁹¹ See American Family Ventures' portfolio on <http://www.amfamventures.com/>

⁹² *Skycure Secures \$8 Million Series An Investment From Shasta Ventures for Mobile Threat Defense*, Skycure, 24 May 2015, <https://www.skycure.com/pr/skycure-secures-8-million-series-a-investment-from-shasta-ventures-for-mobile-threat-defense/>. Crowd data in this case would be, for example, publicly available information on mobile phone activity which could be used to monitor general or targeted cyber-attacks on mobile devices.

Risk of anti-selection due to greater consumer knowledge of their own health status is another concern for insurers.

Anti-selection

On the flipside of the insurer-consumer relationship, life insurers are susceptible to rising risks of anti-selection⁹³ (or adverse selection) as consumers build more understanding of their own health status with the different healthy-living apps and health testing devices available on the market. With the spread of genetic testing, for example, individuals who discover they are at higher risk of disability or death may disproportionately seek to purchase insurance, complicating actuarial risk assessments. The risk of anti-selection could further increase given the anticipated move of control of personal data from businesses to individuals with the rise of aforementioned data sharing platforms such as digi.me and Human API.⁹⁴ This could also raise ethical questions. If an insurer discovers that a policy holder has a high probability of facing medical complications, is the firm duty bound to inform the policyholder. What are the risks of being wrong? Life insurers are currently debating how to approach these issues.

NTPs are non-insurance firms making an entry into the primary insurance market.

Non-traditional players: collaborators or competitors?

Non-insurance firms, referred to here as NTPs, could be collaborative partners or perhaps compete with traditional insurers. Some NTPs have access to huge amounts of data about individuals gathered from consumer use of smartphones, search engines and social media. Some are established brand names with large consumer followings. The NTPs have the potential to monetise the data they have on consumers and thereby disrupt established industries.⁹⁵

They can make an impact in four areas.

There are at least four areas of the insurance value chain where NTPs can have an impact: Lead generation, data monetisation, distribution and direct underwriting. Underwriting is currently perceived to be the most challenging to NTPs.

Table 3

Role of NTPs in the insurance value chain

	Presence in the value chain	Barriers to greater involvement
Lead generation	<ul style="list-style-type: none"> ■ Already play a key role (eg. AdWords) ■ Allow new entrants and small players wider reach and ability to compete ■ Insurers are key customers 	<ul style="list-style-type: none"> ■ Deal with investigations into anti-competitive practices ■ Fear that privileged data access gives unfair advantage over competition
Monetisation of data	<ul style="list-style-type: none"> ■ Collaborative rather than competitive. ■ Has signed partnerships with insurers to make better use of social media 	<ul style="list-style-type: none"> ■ Data privacy concerns ■ Right to be forgotten ■ False profiles created
Distribution	<ul style="list-style-type: none"> ■ Taking first steps in P&C (eg. Alibaba, Overstock, Google Compare) ■ Low presence in life insurance yet 	<ul style="list-style-type: none"> ■ Limited uptake (still small volumes) ■ Need for agency support ■ Research online, purchase offline
Underwriting	<ul style="list-style-type: none"> ■ Unlikely to take on underwriting risk ■ Business model is that of middlemen 	<ul style="list-style-type: none"> ■ Claims data not easily accessible ■ Cannibalise existing business model

Source: Swiss Re Economic Research & Consulting.

⁹³ The adverse impact on an insurer when risks are selected that have a higher chance of loss than that reflected in the applicable insurance rate.

⁹⁴ Note too, for example, the European commission is drafting new data protection legislation that will give consumers more rights to their data. Publication target is 2016.

⁹⁵ This discussion on non-traditional players focuses on the impact on insurers of internet giants using new Big-Data technologies. Firms in other sectors, however, such as telecoms (particularly in the emerging markets) and retailers, also can and already do offer insurance services.

New challenges

NTPs can make use of their proximity to customers to generate leads ...

NTPs which operate search and social media platforms already play a role in lead generation in both life and P&C insurance. Their targeted ad platforms, a main feature of their business model, provide insurers with a vehicle to reach customers directly. NTPs will continue to generate leads for insurers, as competitive pressures push insurers to spend heavily on advertising.

... and open doors through new analytics and innovation experts.

NTPs and insurers could make further use of Big Data. Insurers are building capabilities to make better use of social media for marketing and to engage with consumers. For example, they have partnerships to access the skills and knowledge of Facebook analytics and innovation experts in the mobile field.⁹⁶ Innovative products are being designed specifically for social media. An insurer in Asia Pacific offers users free life insurance for up to USD 10 000 on Facebook for six months.⁹⁷ And, social media platforms now own fitness-tracking apps which could be offered to policyholders.⁹⁸ Collaboration could open up several opportunities as insurers become aware of customer's lifecycle changes, and accordingly recommend products and value-added services.

NTPs could become a much stronger link in the data supply chain, and even validate data in the underwriting process

This could touch underwriting, also as social media data can be used for cross-checking purposes. For example, if a consumer applying for a no-medical-exam policy claims to be a non-smoker and there is social media evidence to counter that, the consumer could be referred for a medical test. However, it will likely be a while before this practice is reality given existing limitations in setting up technical systems that can analyse the data in pictures or videos currently available from different social media platforms, and in determining the context in which text phrases are used.⁹⁹ As technology and data analytics improve though, life insurers may well initiate pilot schemes in which they make use of social media to predict individuals' risk profiles.¹⁰⁰ At that point, NTPs will be an important supplier of information and play a much larger (ie, potentially disruptive) role in the insurance value chain than they do today.

Distribution in P&C has already been infiltrated by NTPs, but the same is not true in the life sector ... yet.

NTPs can also improve distribution in insurance, whether through online price comparison sites (eg, Google Compare) or by direct selling from e-commerce platforms (Alibaba, Overstock). In recent years, these firms have launched platforms through which consumers can receive live quotes, pick coverage and take out a policy. So far this has been restricted to the P&C sector. There is no evidence of the same in life insurance, probably due to the more complex nature of life products, but it could happen in the future. As NTPs increasingly become a first point of contact for consumers, they could expand their influence beyond price comparison to also introduce features such as peer-to-peer ratings systems, by which consumers can rate life insurance providers on aspects such as customer service and satisfaction with the claims processing experience.¹⁰¹ This will increase the transparency of the industry, posing a new reputation management challenge.

⁹⁶ AXA announces a strategic partnership with Facebook to further develop its digital, social and mobile footprint in France and globally, AXA, 11 April 2014, <http://www.axa.co.uk/newsroom/2014/media-releases/axa-announces-a-strategic-partnership-with-facebook-to-further-develop-its-digital-social-and-mobile-footprint-in-france-and-globally/>.

⁹⁷ M. Gray, "Insurer gives away free insurance on Facebook", *Insurance Business New Zealand*, 8 June 2015.

⁹⁸ Moves is a fitness app owned by Facebook that can be used by Vitality members to track their progress and earn points. For a list of apps and devices that Vitality members can choose from, see: <http://www.pruhealth.co.uk/vitality/partners/vitality-activity-tracking/>.

⁹⁹ *Digital Underwriting and Fulfilment, Latest Trends in Digital Underwriting*, The Digital Insurer and Swiss Re, 2014, pp 9-14, <http://www.the-digital-insurer.com/exclusive-digital-underwriting-fulfilment-report-produced-digital-insurer-swiss-re/>.

¹⁰⁰ In 2015 Social Intelligence, a provider of social media risk assessment tools and data, began offering a Social Media Risk Scoring solution for insurers. See "Social Intelligence Launches Social Media Risk Scoring for P&C Insurers", *Business Wire*, 22 April 2015, <http://www.businesswire.com/news/home/20150422005849/en/Social-Intelligence-Launches-Social-Media-Risk-Scoring>.

¹⁰¹ As Google Compare is already doing in the P&C sector. See D. Jergler, "Agent Support, Ratings Added to Expanding Google Compare", *Insurance Journal*, 5 May 2015.

Peer-to-peer models will not be viable in life insurance.

Peer-to-peer insurance and hybrid models such as Friendsurance¹⁰² are unlikely to develop as a viable alternative to traditional life insurance. These models work best in highly commoditised product lines, such as motor. Life insurance contracts are fundamentally different due to their complexity, multi-year nature, potentially large claims and the need for diversification through a significant number of customers to make the insurance viable.

NTPs could go into direct underwriting in life insurance, but are unlikely to do so.

NTPs could also enter direct underwriting in life, but they are unlikely to do so in the near future. NTPs' main competitive advantage is access to data, and expertise in data analytics, which can help in underwriting but is probably insufficient for accurate pricing of life insurance policies. They cannot easily match the insurance industry's knowledge of causality without the claims data and health information history that insurers possess. Thus, NTPs are best positioned to help insurers in distribution and share the profits of better risk selection from customer segmentation.

Their competitive strength is to act as data brokers, connecting insurance buyers with sellers.

There is also a question of strategic fit of underwriting for NTPs. They have built platforms that allow them to function as middlemen, connecting buyers with sellers and monetising that interaction. This remains their dominant revenue stream, which they may be reluctant to undermine by going into non-core areas. The following table outlines the existing areas of involvement of a few companies already involved in the insurance market and their potential future role in insurance. The analysis is based on publicly available information from media articles, journals and company websites.

¹⁰² Friendsurance has developed a peer-to-peer insurance concept, which rewards small groups of users with a cash-back bonus at the end of each year they remain claimless. See <http://www.friendsurance.com/>.

New challenges

Table 4

Non-traditional players and their current and potential future involvement in insurance

	Current role in insurance	Potential future role in insurance
Google	Plays a key role in lead generation. "Insurance" is one of the most expensive of all its keywords. ¹⁰³ Plays role in P&C distribution through Google Compare launched in the UK (2012) and US (2015). No life insurance support as yet. ¹⁰⁴	Could enter the market with a regulated insurer and leverage its search data for improved distribution and underwriting.
Facebook	Offers insurers dedicated resources, including innovation & analytics teams to develop brand presence on Facebook, particularly mobile. ¹⁰⁵ Insurers have begun using Facebook as a distribution channel. Facebook has also bought a fitness-tracking app start up (Moves), which insurers may recommend to policyholders. ¹⁰⁶	Could leverage group buying power, especially for simple types of insurance. Over time could gain access to activity data from the fitness tracking apps that it owns. Has begun to offer ads to consumers based on their activities on other, non-Facebook online portals. ¹⁰⁷
Apple	Health Kit is Apple's connected health hub. Collates health and fitness data from various apps and provides users with an overview of their health. ¹⁰⁸	Insurers could support Health Kit and Apple Watch for data collection and may subsidise the Watch. Watch could be used for remote monitoring of health or more accurate pricing of life and health insurance risks.
Amazon	Amazon has good data on actual and intended purchasing behaviour on millions of customers. Small presence in advertising historically, but is now building an ad network that reaches onto many other sites. ¹⁰⁹	Could give insurers direct access to information about individuals' browsing, purchasing, and product review histories, but this currently seems unlikely. Instead, could create target audiences, e.g. people who recently purchased organic health foods. An insurer could then use Amazon's technology to bid for the ability to show ads to a person in that category.
Alibaba	Ant Financial (affiliate of Alibaba) has set up an online insurer (Zhong An), with Tencent (a social media firm) and Ping An. Zhong An underwrites risks and also manages policies. ¹¹⁰ Also has Zhao Cai Bao, a peer-to-peer platform that allows SMEs and individuals access to loans and universal life insurance.	Its integrated platform is a key capability. Alipay (online payment platform) to move into medical care and pharma by leveraging its mobile platform and enabling users to register for consultations, monitor queues and conduct payments. Can sell low cost micro-insurance. Distribution costs would be minimal. ¹¹¹
Overstock	Offers a price comparison service for auto and homeowners insurance, as well as commercial policies for small businesses. ¹¹²	Sees insurance as part of extended offerings. Slow uptake in the course of first nine months. Only able to sell a small number of policies in 2014. ¹¹³

Source: Swiss Re Economic Research & Consulting.

¹⁰³ L. Kim, "How Does Google Make Its Money: The 20 Most Expensive Keywords in Google AdWords", wordStream.com, <http://www.wordstream.com/articles/most-expensive-keywords>

¹⁰⁴ CB Insights "Google's Rising Investments and Partnerships in Insurance Tech", cbinsights.com, 21 October 2015, <https://www.cbinsights.com/blog/google-insurance-tech-investments/>

¹⁰⁵ AXA announces a strategic partnership with Facebook to further develop its digital, social and mobile footprint in France and globally, AXA, 11 April 2014, <http://www.axa.co.uk/newsroom/2014/media-releases/axa-announces-a-strategic-partnership-with-facebook-to-further-develop-its-digital-social-and-mobile-footprint-in-france-and-globally/>

¹⁰⁶ Moves joins Facebook!, Moves, 24 April 2014, <https://www.moves-app.com/press>

¹⁰⁷ Making Ads Better and Giving People More Control Over the Ads They See, Facebook, 12 June 2014, <http://newsroom.fb.com/news/2014/06/making-ads-better-and-giving-people-more-control-over-the-ads-they-see/>

¹⁰⁸ HealthKit allows apps that provide health and fitness services to share their data with Apple's Health app and with each other. See HealthKit homepage on <https://developer.apple.com/healthkit/>

¹⁰⁹ L. O'Reilly, "Amazon is working with the advertising industry to make all ads on the web better", Business Insider, 24 March 2015, <http://uk.businessinsider.com/amazon-dan-wright-interview-ad-week-europe-2015-3?r=US&IR=T>

¹¹⁰ Asia Insurance Review "China: Online insurer Zhong An raises US\$ 935 mln", asiainsurancereview.com, 12 June 2015, <http://www.asiainsurancereview.com/News/View-NewsLetter-Article?id=32985&Type=eDaily>

¹¹¹ For a detailed analysis of Alibaba's involvement in insurance, see: Insurance and Technology Insight: The Emerging Role of Ecosystems in Insurance, Morgan Stanley and BCG, 23 March 2015, pp 20-21, <https://www.bcgperspectives.com/content/articles/insurance-technology-financial-institutions-disruptive-force-ecosystems/>

¹¹² For an overview of Overstock's insurance offerings, see <http://www.overstock.com/insurance>

¹¹³ According to Overstock's CEO Patrick Byrne, its ecommerce platform sold only a few thousand policies in 2014, or "the equivalent of a small-town brokerage". See C. Dougherty, "Insurance via Internet Is Squeezing Agents", New York Times, 18 January 2015, http://www.nytimes.com/2015/01/19/technology/insurance-via-internet-is-squeezing-agents.html?ref=business&_r=2

Conclusion

The entire life insurance value chain will be impacted by technology and data analytics.

The digital-age consumer has different expectations, which life insurers can capitalise on ...

... by investing in a fundamental rework of their operating and IT systems, and specialist talent.

Life insurers will also need to implement new risk management procedures, and respond to the rise of non-traditional industry players.

The life insurance sector is set for fundamental transformation, brought about by technological advancements and new digital data analytic techniques. The impact is expected to span the entire insurance value chain from product development and underwriting through to distribution, services and claims. To date, the sector has been slow to adopt new technologies, but this is changing.

The rapid spread of internet-enabled devices and universal connectivity has resulted in a change in consumer behaviour and expectations across all industries, particularly among the younger generations (ie, future customers). The digital age has also brought an explosion of heterogeneous data from different sources and platforms, which is something that life insurers can utilise to broaden their reach and also push the bounds of insurability. However, to harness the power of digital capabilities to be able to identify trends early, gain insights into consumer preferences and make operations more efficient, they will need to invest in Big Data and predictive analytics.

Technology will fundamentally change the business of insurance. To remain competitive in the digital age, life insurers will need to reconfigure their traditional IT systems into open innovation platforms in order to access the new data sources, obtain a unified view of the customer, and offer a consistent experience across consumer touch points. They will do well to keep track of ongoing innovation by partnering with established and/or start-up technology vendors, and take lessons from how other industries make use of the new tools and emerging capabilities. Importantly, insurers should also focus on sourcing specialist talent.

New technologies, however, also bring new challenges. Life insurers will need to implement new risk management procedures, importantly around consumer data protection. They will also need to monitor and adapt to regulatory changes with respect to the use of digital data and analytics in underwriting. The rise of non-traditional players is another development life insurers need to respond to. The new entrants present opportunities for mutually beneficial partnerships, but they could also eventually become direct competitors.

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