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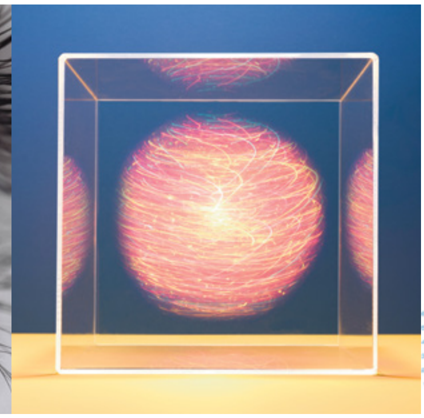

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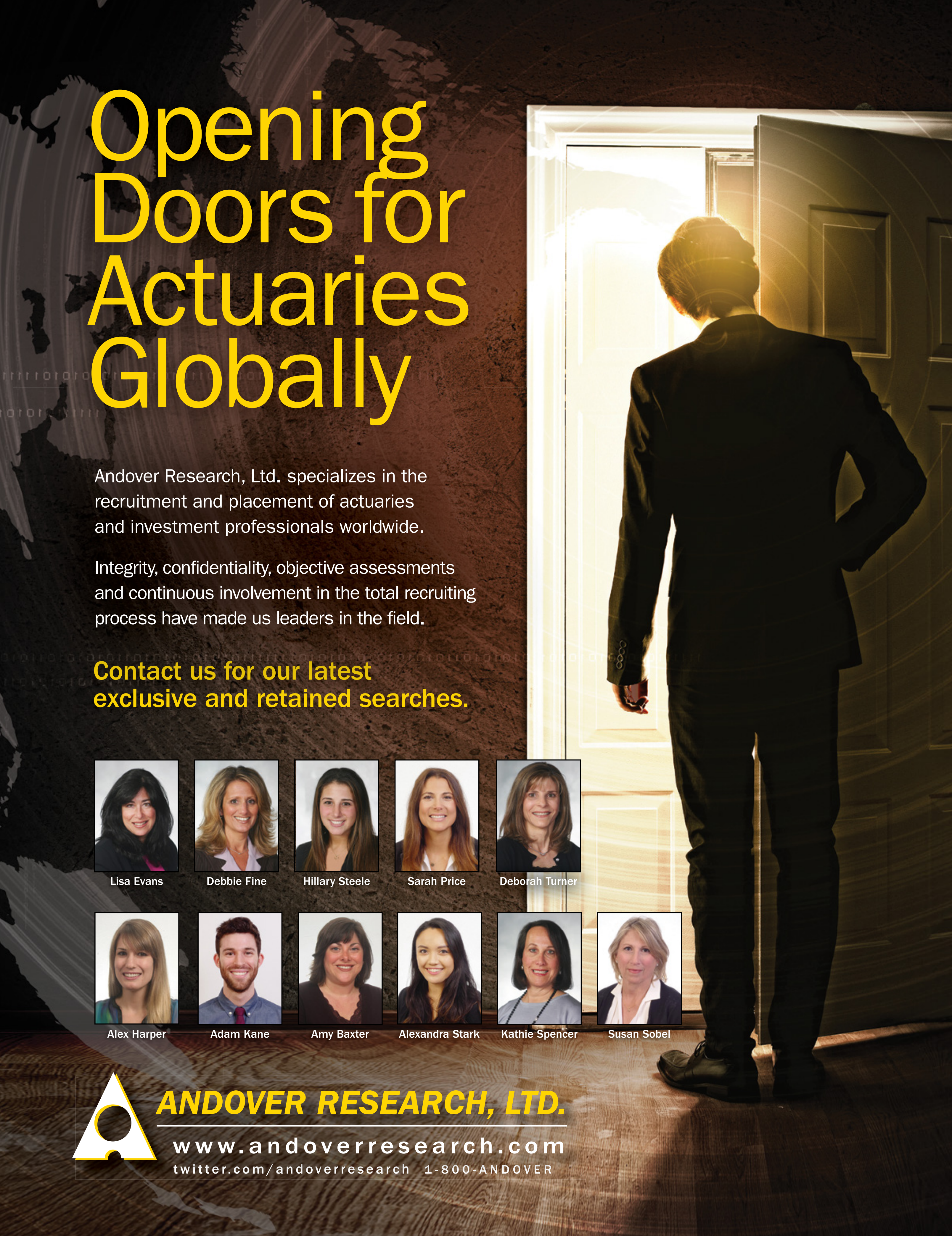
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EDITORIAL

The InsurTech/ FinTech ecosystem

BY SARAH HINCHEY

I remember when I first heard the term "InsurTech" back in 2015. I had recently moved to Silicon Valley after spending five years living and working abroad, and FinTech's younger sibling, InsurTech, was rapidly gaining attention and making headlines. I remember reading articles about looming industry disruption from tech giants and digitally-born startups alike, and I wondered what this might mean for the industry as a whole. Were we about to experience a sudden revolution?

My intrigue led to action, and I attended several Silicon Valley conferences and events where I could meet the players in the InsurTech world to gain a better understanding of what was really happening. I went in expecting traditional slideshow presentations, skepticism, and an "us versus them" sentiment between industry incumbents and technology newcomers. What I discovered was a buzzing ecosystem of mission-driven entrepreneurs, carriers and reinsurers seeking opportunities to collaborate with startups, venture capitalists, startup incubators and accelerators—and even some insurance regulators recognizing the need to adapt to a changing market environment. Contrary to my initial expectations, this was a community of open-minded optimists and change-makers who shared a common understanding of the need to transform the insurance industry to adapt to growing customer expectations, and a willingness to listen to and learn from each other. It became clear to me that "InsurTech" embodies this interconnected ecosystem in a merger of modern technology with insurance.

The InsurTech ecosystem has gained much attention, as is evident by the real investment dollars in play. In 2016 alone, InsurTech startups raised $1.7 billion across 173 deals globally, with about 60 percent of these deals happening in the United States.[1] This reflects an upward trend compared to 2011, when InsurTech startups raised only $140 million across 28 deals.[2] Of the hundreds of InsurTech startups that have sprouted up across the globe, the vast majority are not trying to become manufacturers or carriers themselves, but rather they are applying their technology to tackle different elements of the value chain across industry subsectors. By merging modern technology with insurance business models, startups can help insurers accelerate the pace of change in areas such as distribution, customer engagement, product development, operations, claims management and more. So what might we expect to see in the InsurTech space going forward? Here are my thoughts.

ACCELERATED EVOLUTION RATHER THAN REVOLUTION

While two or three years ago there was fear around sudden industry disruption and the threat of tech giants overhauling the insurance industry, so far the transformation has been evolutionary rather than revolutionary. Given our highly regulated industry, I expect this trend to continue.

INCREASED PARTNERSHIPS

That being said, I believe the (re)insurers that embrace InsurTech partnerships to help accelerate transformation

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will be well-positioned to survive a major industry disruption. Rather than competing with InsurTech startups, (re)insurers increasingly are warming up to the idea of collaboration to accelerate the pace of change in the industry. As a starting point, digitally native startups can bring modern user experience/user interface (UX/UI) capabilities to help insurers become more customer-centric in their communications and interactions. I expect after insurers modernize the front-end aspects of their businesses, there will be an increased focus on modernizing back-end operations, such as product development, underwriting and pricing, to gain a competitive edge and create truly personalized products and customer experiences.

NEW DISTRIBUTION CHANNELS

Modern technology offers the possibility to significantly cut down on time and effort needed to apply for insurance by enabling applicants to get coverage through a few taps on their phone, without ever needing to meet with a human agent. But even beyond direct, digital distribution channels, we are starting to see insurance embedded in other ecosystems. Consider an auto manufacturer that recently announced plans to embed insurance coverage in the price of its cars, thereby eliminating the need for the customer to shop separately for a policy.[3] The concept of insurance offered at the point of sale or embedded within noninsurance platforms is one that I expect to continue to gain traction as it enables a more relevant and convenient customer experience.

FOCUS ON PREVENTION TO DRIVE CUSTOMER ENGAGEMENT

Speaking of customer experience, compared with other industries such as banking, retail and travel, the insurance industry historically has not had much customer interaction outside of acquisition, premium payments and claims. With so few touchpoints along the customer journey, it can be difficult to develop meaningful, long-lasting customer relationships. In the past, insurers may have used fear-based messaging to raise customer awareness about risk events (e.g., death, disease, home/auto damage). Now with the rise of wearable devices, telematics devices and home automation systems, insurers can shift the focus from risk and restitution to prevention, wellness and safety, thereby creating opportunities for more frequent and meaningful customer engagement and relationship-building.

SHIFT FROM USE CASES TO BUSINESS CASES

As (re)insurers seek collaborative opportunities with startups, they tend to look for startups that will help them achieve their strategic objectives. Part of this journey may involve taking an experimental approach, and conducting several pilot projects with different startups tackling different use cases, to test out different technologies and methods before committing to a major investment. Eventually, (re)insurers likely will start to make strategic investments based on insights derived from these pilot projects, and we could start to hear more stories of tangible business impact in the form of cost savings and revenue generation stemming from InsurTech collaboration.

So what does this mean for actuaries? There are many opportunities for actuaries to play a role in accelerating transformation of the industry. Just as technology entrepreneurs and software engineers are driving the "tech" part of InsurTech, actuaries can be the engineers driving the "insur" part—because actuaries understand how the many pieces of the business fundamentally work together. Actuaries with learning mindsets, experimental attitudes and personal drives to be problem-solvers are well-positioned to thrive in the InsurTech space. They only need to seek out the opportunities.

I hope you enjoy this issue of *The Actuary*, which contains articles and insights from various perspectives of innovators and insiders from the InsurTech/FinTech ecosystem. ■

References

1 "Insurance Tech Startups Raise $1.7B Across 173 Deals in 2016." CB Insights Research. July 19, 2017. *https://www.cbinsights.com/blog/2016-insurance-tech-funding*.

2 Supra note 1.

3 Etherington, Darrell. "Tesla Wants to Offer Vehicles With One Price, Including Insurance and Maintenance." TechCrunch. February 22, 2017. *https://techcrunch.com/2017/02/22/tesla-wants-to-offer-vehicles-with-one-price-including-insurance-and-maintenance*.

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from the PRESIDENT

BY JEREMY J. BROWN

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Progress in the profession

I began my year as president of the Society of Actuaries (SOA) by talking about the pride that actuaries have for their profession, and the hard work and rigor that embodies who we are. I also spoke about the importance of continuous learning and the SOA's Strategic Plan in helping us to advance the profession.

This year, we collectively have accomplished so much on behalf of the profession. We have taken new leaps forward with predictive analytics. We have looked for innovative ways to enhance educational opportunities and member participation. We've banded together to develop new ideas and tap into our knowledge and skills to address timely topics affecting the public.

You've probably heard me say time and time again how I'm a firm believer in, and a subscriber to, lifelong learning. This year was no exception. We witnessed changes to the ASA curriculum and other new advancements and offerings with professional development, including the predictive analytics efforts with our inaugural symposium and seminars tailored by experience level, and also the pilot of the SOA's certificate program for predictive analytics. I was glad to see that a number of our members participated in these offerings, and I'm happy about the positive responses we've received.

I've appreciated the many conversations with members and candidates, the meetings with other actuarial organizations, and the messages and notes from you all. I've learned new ideas from meetings with actuaries around the world, and I've had the opportunity to glean different approaches from our professional development meetings. I also enjoyed speaking with future actuaries at universities and candidate events, and especially with brand-new fellows of the SOA at Fellowship Admissions Courses. I've long volunteered with education throughout my time as an SOA member, and this experience continues to stand out to me.

In past columns, I've highlighted the SOA's global efforts to support the profession, the benefits of networking and volunteerism, and, of course, expanding opportunities for actuaries, particularly with predictive

> "We need to reach out to future generations to help them understand and consider becoming part of our profession."

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analytics. I also discussed how we're bringing the SOA's Strategic Plan to life. These are all important ideas, ones that help define our organization and its members.

We need to reach out to future generations to help them understand and consider becoming part of our profession. This outreach embodies the concept of inclusion, as we partner with other organizations and groups from the perspective of diversity. We need new ideas and viewpoints to continue innovating within our field, and that includes fostering the best and brightest to join us.

> "We need new ideas and viewpoints to continue innovating within our field, and that includes fostering the best and brightest to join us."

Through participation with volunteer opportunities, maintaining our pride in the profession and our focus on embracing progress—the ever-expanding future—we can and will continue to make great strides and accomplishments in advancing the actuarial profession.

There is also the fantastic thought leadership that our members have helped bring to the forefront of conversations, from health care to longevity and pensions. Actuaries are leaders, and through member volunteers sharing their insights, we've been able to continually help raise the profile of actuaries.

Again, I thank you for the opportunity to serve as your president and encourage you to participate with the organization as much as you can. There is much you can gain and, in turn, much to give back to the profession. ■

RELATED LINKS

SOA Strategic Plan
SOA.org/strategic-planning

SOA Curriculum
SOA.org/curriculumchanges

Diversity and Inclusion
SOA.org/about/diversity-inclusion/default

Predictive Analytics
SOA.org/predictive

IABA
INTERNATIONAL ASSOCIATION OF BLACK ACTUARIES

CONGRATULATIONS TO THE IABA

The Society of Actuaries (SOA) congratulates the International Association of Black Actuaries (IABA) on its 25th anniversary! For 25 years, IABA's focus on increasing the number of black actuaries and influencing their successful career development and civic growth and achievement has helped the IABA realize its vision to be the world's leading actuarial organization dedicated to influencing diversity. Membership is open to all who support its mission.

RELATED LINK

Read the IABA newsletter, which includes a timeline of the IABA from the last 25 years.
bit.ly/2wt5hG9

Promoting the profession

A ROUNDUP OF NEWS FROM THE GLOBAL COMMUNITY

Whether you travel the world or never leave your home country, you are affected by global organizations, international requirements and the increasingly international nature of the actuarial profession itself. Here is some news from around the world.

THE SOA MEETS WITH FACULTY IN CHINA

On July 5, a Society of Actuaries (SOA) faculty roundtable meeting was held at the Kerry Center in Beijing, China. SOA Past President Harry Panjer, FSA, CERA, FCIA, HonFIA, PhD; Senior Staff Fellow Stuart Klugman, FSA, CERA, PhD; and SOA Lead China Representative Jessie Li, FSA, attended the roundtable meeting. Fifteen professors from 10 universities were invited to participate in the discussion and exchange ideas about actuarial education. Steve Zhang, general manager of MunichRe Greater China, also participated as a special guest.

Klugman and Panjer led the discussions with the professors, which covered a variety of topics, including how to strike a balance between developing technical and business skills, and how to incorporate analytics into the curriculum to prepare students for exams and future jobs. The professors shared their experiences and challenges regarding actuarial teaching and research. Professor Xiaojun Wang and Steve Zhang gave a short speech on behalf of the SOA China Committee. They encouraged professors to work closely with the SOA and to reach out to the SOA for collaboration opportunities.

THE 8TH CHINA RISK MANAGEMENT AND ACTUARIAL FORUM

The SOA participated in the China Risk Management and Actuarial Forum (CRMAF) on July 8 at the University of International Business and Economics (UIBE) in Beijing, China. The event included more than 200 faculty members and industry experts, and 100 UIBE students. SOA Lead China Representative, Jessie Li, FSA, acted as the moderator in a concurrent session held in the afternoon.

The CRMAF is an annual academic event jointly organized by 14 universities and colleges on a rotational basis. The conference included one plenary session in the morning and six concurrent sessions in the afternoon. In total, there were 51 sessions and 69 speakers, including two speakers from overseas. During the plenary session, the president of UIBE gave a speech and the dean of insurance faculty presented the *2017 China Actuarial Science and Risk Management Report*.

CRMAF was initiated by professor Xiaojun Wang from Renmin University, professor Zhuo Zhi from Shandong University of Finance and Economics and professor Xie Zhigang from Shanghai University of Finance and

Economics, after they attended and were inspired by the 29th South African International Congress of Actuaries. The forum's goal is to promote risk management and actuarial education, support the development of the actuarial profession and enhance cooperation among colleges and industry.

Next year, the 9th CRMAF will be held at Shandong University of Finance and Economics in Jinan, China.

LATIN AMERICA COMMITTEE TO MEET IN BOGOTÁ

Representatives from the Latin America Committee (LAC) will attend the 6th International Actuarial Symposium in Bogotá, Colombia, Oct. 26–27, held by the Colombian Association of Actuaries (Asociación Colombiana de Actuarios). This is the main actuarial event in the country, and it is attended by actuaries, statisticians, risk professionals and actuarial students. Among the agenda topics are predictive analytics, risk management and regulation. In addition to the symposium activities, on Oct. 25 there will be a Professionalism Course, and on Oct. 28 there will be specialized short courses on interest rate models and predictive modeling.

This is a great opportunity to join together, network and learn about the latest developments in our profession. Special registration prices for students are available. For more details, see the Related Links.

The LAC was formed in late 2016 to promote the actuarial profession in Latin America and foster closer relationships in the area through joint projects. For more information on the LAC, read the May 2017 issue of *International News*, published by the International Section. ■

RELATED LINKS

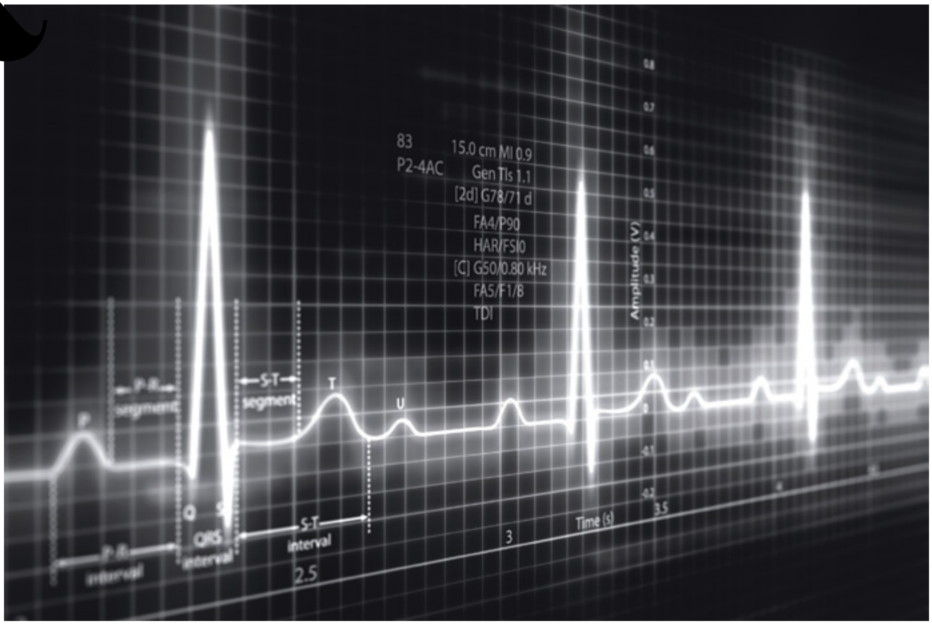
Sixth International Actuarial Symposium
www.actuarios.org.co

May 2017 Issue of *International News*
bit.ly/May-2017-IntNews

new & noteworthy

TECHNOLOGY'S PROMISES

Here's your source for industry briefings and SOA news. Important headline information, section highlights and current stories—in short, news to note.



ACTUARIES AS HEALTH CARE PROBLEM-SOLVERS

The health care industry seeks relevant solutions to address the increasing complexity of its business. In a recent video, members of the Society of Actuaries (SOA) discuss the growing number of opportunities with predictive analytics. These health actuaries share how to make an impact in the health care industry through custom models and analytics. Learn more about the work of health actuaries with predictive analytics by visiting the Related Links.

RELATED LINKS

Actuaries as Health Care Problem-Solvers Video
bit.ly/SOA-HC-Video

Health Actuaries and Predictive Analytics
bit.ly/HC-Emerging

FIVE MISTAKES TO AVOID IN RETIREMENT

Retirement planning doesn't stop when you retire. Understand all of the options and avoid these common pitfalls.

RELATED LINK

Insights from Morgan Stanley
bit.ly/5Mistakes-MS

THE PROMISE OF PREDICTIVE ANALYTICS

What can applying predictive analytics do for an organization? The experts contend predictive analytics continues to offer a better way of forecasting future probabilities and trends.

RELATED LINK

Special Report: The Promise of Predictive Analytics
bit.ly/CFO-Predict-Promise

new & noteworthy

TECHNOLOGY SECTION UPDATE

BY PAUL RAMIREZ

The goal of the Society of Actuaries' (SOA's) Technology Section is to "promote the exchange of information concerning technology as it relates to the work of actuaries" as well as "facilitating the adoption of new technology," as its mission statement reads.

The role technology plays in the actuarial career is at an inflection point; the pace at which technological changes and developments are occurring seems to be increasing every year. Predictive analytics is driving much of this change. R and Python increasingly are being used by actuaries. Actuaries are starting to work with Hadoop, Pig and Hive. Cloud computing is becoming more and more prevalent, while artificial intelligence and automation are affecting all areas of insurance. FinTech and InsurTech companies are emerging and providing new competitive threats to insurance companies and actuaries.

While some actuaries may be familiar with these technologies, many are probably completely unfamiliar with them. In order to help fill in these gaps, the Technology Section sponsored a call for essays on cutting-edge technology. The submission deadline has passed, but we plan on publishing the submitted essays in early 2018.

Another initiative of the Technology Section for 2017 is to revamp both the Tools for Actuaries and Apps for Actuaries landing pages (see Related Links). These websites have been around for a number of years, but they are lightly trafficked. In the short run, we are working with the SOA to broaden the set of tools and apps that can be listed on these sites. We hope that, in the future, actuaries will be using these sites to share any tools they find valuable, including R scripts, Python scripts, Excel tools, VBA scripts and so much more. We will be hosting a contest later this year to award a cash prize to the actuary who suggests the best technology tool/apps to upload. See the Technology Section homepage for more details. In the long run, the Technology Section is partnering with the SOA to provide a tool repository that can provide capabilities such as rating, commenting and revision-tracking.

Earlier this year, our section council held our first in-person meeting. It was well-attended by the council and was instrumental in setting our direction for the upcoming year. Among the topics we discussed was how to better serve our section members.

We are committed to continuing to deliver value to our membership through our well-received newsletter and webcasts. In response to feedback from section members, we switched formats from an electronic newsletter to a paper newsletter, as well as reducing its frequency from quarterly to semiannually. Our webcasts in the last few years have been very well-attended, and we are focused on delivering diverse topics that are of value to actuaries in the upcoming years.

Feedback on these recent changes has been positive, and we continue to welcome more constructive comments from our audience. Technology does not stand still; nor does our section, as we continue to strive to provide value to members.

If you are not a member of the Technology Section, I encourage you to join. Technology is a critical part of our jobs as actuaries, and its importance will only grow in the future. If you are interested in volunteering, there are a number of ways to get involved: You can write an article, join as a friend of the section or run for a section council position. The Technology Section is a great community of actuaries—don't miss out! ■

Paul Ramirez, FSA, MAAA, is a vice president and actuary for Actuarial Finance and Data Analytics at Allstate Benefits.

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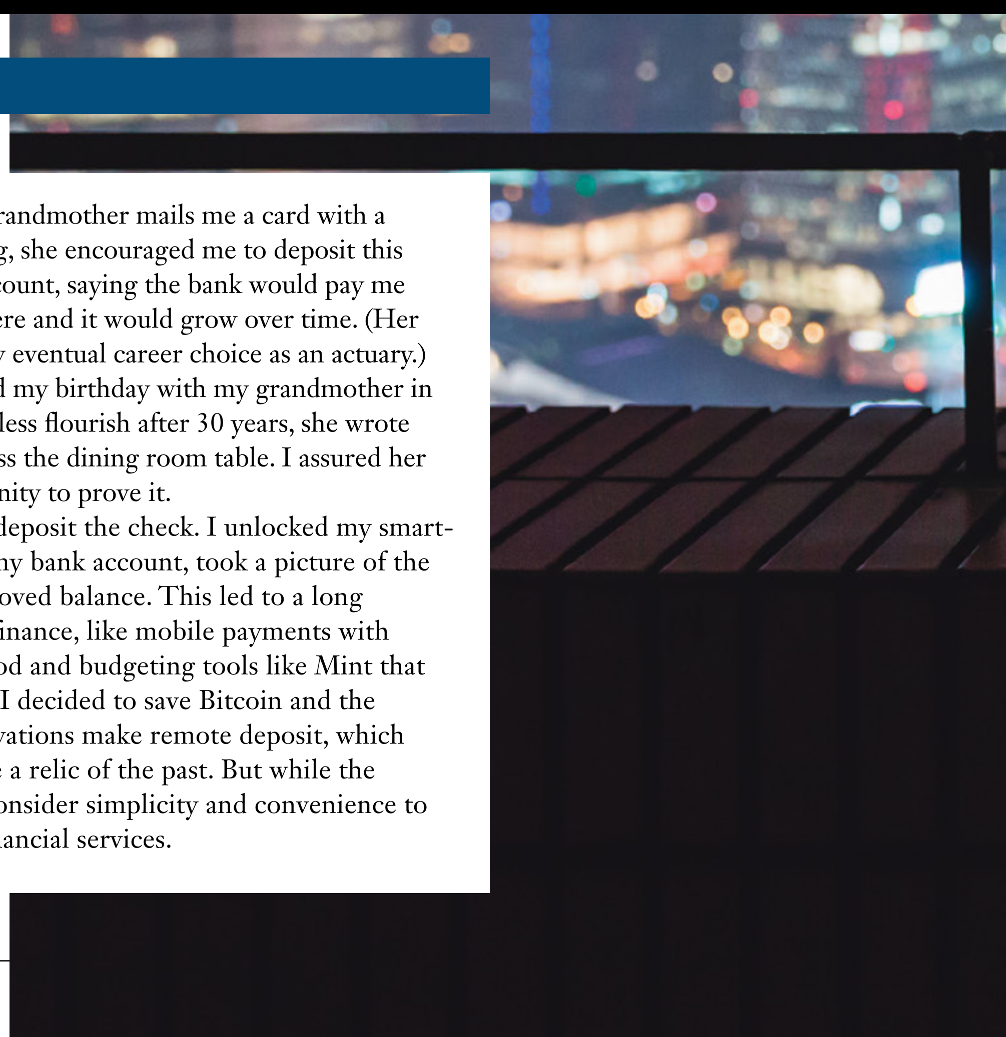
RELATED LINKS

Tools for Actuaries
toolsforactuaries.org

Apps for Actuaries
appsforactuaries.org

CREATIVE LANDSCAPE

FINTECH COMPANIES EMBRACE CREATIVE APPLICATIONS OF NEW TECHNOLOGY TO PROVIDE FINANCIAL SERVICES TO CONSUMERS



BY JASON ASH

Every year on my birthday, my grandmother mails me a card with a check inside. When I was young, she encouraged me to deposit this birthday money in a savings account, saying the bank would pay me even more money to keep it there and it would grow over time. (Her advice likely played a role in my eventual career choice as an actuary.) This year, I had the good fortune to spend my birthday with my grandmother in person. As expected, though with slightly less flourish after 30 years, she wrote the annual check and passed it to me across the dining room table. I assured her I would deposit it, and I took the opportunity to prove it.

I asked her if she wanted to watch me deposit the check. I unlocked my smartphone with my fingerprint, logged into my bank account, took a picture of the check, and showed her my new and improved balance. This led to a long conversation about other technology in finance, like mobile payments with Venmo, free stock trading with Robinhood and budgeting tools like Mint that link directly to a person's bank account. (I decided to save Bitcoin and the Blockchain for another day.) These innovations make remote deposit, which was first implemented in 2003,[1] seem like a relic of the past. But while the novelty may be gone, consumers today consider simplicity and convenience to be requirements, rather than perks, of financial services.

WHAT IS FINTECH?

FinTech, a neologism that blends the words "finance" and "technology," is the name for these and other endeavors that use technology to improve financial services. But not all FinTech companies are tech-driven startups looking to disrupt the status quo. Some companies have found a lucrative niche by collaborating with existing institutions, and many of those same existing institutions have established internal venture groups to fund new innovations directly. Others, like Blackrock, have entered the space through acquisitions,[2] and it is not hard to guess which large companies are backing new services like Google Wallet and Apple Pay. In other words, it would be a mistake to think that FinTech is separate from or outside of the broader financial services industry. Instead, it encapsulates most of what is innovative in finance today—not because FinTech companies in Silicon Valley are the only innovators, but because FinTech companies have fully embraced creative applications of new technology.

However, innovation often causes disruption, and FinTech's rapid growth has been far from smooth. Among the challenges it still faces are integrating into the financial services ecosystem, sculpting a fair and responsible regulatory landscape, and overcoming setbacks that threaten to distract from progress. For this industry to be guided responsibly, all financial professionals, including actuaries, should play a role in its continued evolution.

Actuaries possess skills that are particularly well-suited to many challenges facing the FinTech industry today. Yet actuaries are woefully underrepresented within FinTech companies. My hope is that our profession will find a way to partner with FinTech. Thousands of new job listings request actuaries in every way except by name. For example, a FinTech lender seeks a director of Data Analytics who is "highly analytic, paired with strong communication skills and a proven track record of translating data insights into actionable outcomes that result in business growth." Another company seeks a director of Risk Modeling & Forecasting who is to be "responsible for risk analysis, developing underwriting/pricing/response/forecasting models and developing analytic tools." Among an actuary's most transferable skills is an aptitude for understanding the world through data and translating this understanding into strategic action. And, if there is one thing all FinTech companies share, it is an unceasing hunger for data and the value that can be derived from it.

Nearly all FinTech companies benefit from a virtuous cycle of data that helps them improve and expand their services over time. Charles Moldow, a partner at the venture firm Foundation Capital and an early FinTech investor, wrote about the benefits of this virtuous cycle for online marketplace lenders. He says: "Data from loan performance feeds back into the marketplace lender's model, creating an even more accurate model. As the accuracy of the data and model increases, the marketplace lender can offer borrowers lower rates. As rates decrease, more borrowers flock to the platform, driving more data into the model."[3]

FINANCIALLY CREATIVE LENDING PRACTICES

Consider SoFi, an online lender founded in 2011 whose name stands for Social Finance. Its founders hypothesized that graduates of elite universities would be highly likely to repay their student loan debt, and they began a pilot program to refinance $2 million of loans from Stanford students at lower interest rates. Eventually, as SoFi offered more loans and gathered more data, it improved credit underwriting, refinanced a higher number of loans and lowered its rates even more. In 2016, after having gathered data from more than $19 billion of loans, SoFi publicly stated that it would no longer use FICO credit scores in its underwriting models, believing instead that data—such as employment history and monthly free cash flow[4]—cultivated from its member base of more than 300,000 individuals provided better predictive power. By some estimates, FICO is used by 90 percent of all lenders in the United States,[5] so this move reveals how much confidence SoFi has in its proprietary machine learning models.

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IF THERE IS ONE THING ALL FINTECH COMPANIES SHARE, IT IS AN UNCEASING HUNGER FOR DATA AND THE VALUE THAT CAN BE DERIVED FROM IT.

Companies like SoFi estimate a borrower's probability of default using information from a short online loan application that is later linked to data from other sources. These lenders have found creative ways of extracting every piece of information they can while making the application process as painless as possible. In fact, lenders may prefer to keep the application simple to reduce adverse selection,[6] reasoning that any unnecessary complication may drive away higher-quality applicants who aren't desperately seeking funds. To do this, lenders use intelligent filters to decide whether to verify certain application information, such as whether the applicant's stated income is within a threshold of the average income for people with the same job in the same geographic area. Some lenders use services like Plaid, another FinTech company, to connect directly to a person's bank account and calculate monthly free cash flow. Lastly, they purchase thousands of data points for each applicant from credit bureaus like TransUnion. While SoFi may not use FICO in its models, like most lenders, it still relies on a "track record of meeting financial obligations" established through other credit information like outstanding debt, payment history and number of open credit lines.[7]

In just a few seconds, a credit model uses this data to approve or decline the applicant. Behind the scenes, the credit model is calibrated with millions of historical records made up of thousands of attributes each, and the latest machine learning algorithms are pitted against one another to identify those with the most predictive power. Logistic regression, a staple in probabilistic forecasting, is commonly used. But other techniques, notably ensemble methods like random forests or gradient boosting trees, are becoming increasingly important.

These models construct decision trees from loan attributes in a historical training data set to separate good loans from bad ones. One decision tree might have thousands of decision points, such as "applicants with no late payments on credit cards." A record that meets this criterion is sent in one direction to more decision points deeper in the tree, while a record that fails is sent in another direction. Each record in the training data set traverses many layers through the tree before the model predicts its probability of default. This prediction then is compared against the actual outcome to measure the model's accuracy. As a final step, hundreds of decision trees are generated and combined—hence the name ensemble models—to reduce overfitting and improve the model's predictive power for data it hasn't yet seen.

Marketplace lenders understandably are private about the exact models and techniques they use to underwrite potential borrowers. After all, underwriting, like it is for insurers, is a critical component of a lender's competitive advantage. But if SoFi's wager on its own models pays off—and, to be clear, this is an ongoing risk that the company faces—it would allow SoFi to compete even more effectively against banks as well as other industry incumbents, using its data in creative ways beyond student loan refinancing. In fact, building on its early success, SoFi has expanded to offer wealth management services, mortgage refinancing and term life insurance, which together suggest the company's desire to engage continuously with its members from college graduation through retirement. But if a successful FinTech company is one that starts by focusing on a single service, gathers data and uses this data to expand its services to meet more diverse needs, then what ultimately separates it from the financial institutions it sought to disrupt? Increasingly, the lines are being blurred as FinTech companies play a larger role in providing financial services to consumers.

"If a successful FinTech company is one that starts by focusing on a single service, gathers data and uses this data to expand its services to meet more diverse needs, then what ultimately separates it from the financial institutions it sought to disrupt?"

KEEPING UP WITH REGULATIONS

One consequence of this rapid technological development is that the regulatory environment has struggled to keep pace. In an effort to create a more consistent regulatory standard, early this year, the U.S. Office for the Comptroller of the Currency (OCC), the bureau responsible for chartering and supervising banks, announced it would allow FinTech companies to apply for special purpose bank charters.[8] (Incidentally, Abraham Lincoln signed the law establishing the OCC and the national banking system, which was considered innovative at the time. If only it were possible to hear Abraham Lincoln's thoughts on FinTech!)

Companies granted a special purpose FinTech charter would be regulated like banks and supervised by the OCC. Today, many of these companies inhabit gray areas between existing regulatory frameworks. For example, Lending Club, which is not a bank, partners with banks like Utah-based WebBank to originate consumer loans. While Lending Club is not obligated to follow banking regulations, it nevertheless voluntarily chooses to comply with laws that apply to banks, like the Truth in Lending Act. In 2008, Lending Club also worked closely with the Securities and Exchange Commission (SEC) to create a new registered financial product called the Note, which is a small slice of a larger loan (as small as $25) that can be bought and sold much like a stock.[9] Nevertheless, the OCC hopes that a special FinTech charter could move away from these bespoke regulatory arrangements, promote consistency and "make the federal banking system stronger."[10]

This regulation also comes at a time of recent turbulence in this nascent industry. Despite an impressive track record of venture financing—$36 billion globally in 2016[11]—the FinTech industry has had its share of setbacks, which serve as reminders that its long-term viability is not a foregone conclusion. In the online credit space alone, Lending Club was rocked by a scandal in 2016 in which its CEO resigned and its stock price fell more than 50 percent, calling into question the effectiveness of its internal quality controls.[12]

Also in 2016, Avant, a Chicago-based online lender, laid off 60 employees and requested voluntary severance from others.[13] Prosper Marketplace recently announced it has significantly overstated investor returns on its website for several quarters,[14] a failure that has the potential to draw scrutiny from the Consumer Financial Protection Bureau. Yet these events reveal opportunities to improve and shape a promising industry, not flaws in the FinTech value proposition.

OPPORTUNITIES FOR ACTUARIES

The FinTech industry clearly has momentum, but it is still in its early stages. After achieving initial success brought about by rapid technological innovation, it now must establish itself as a dependable service that provides long-term value for consumers. The pace of innovation is unlikely to slow, and FinTech companies need professionals to guide the next phase of growth. These professionals should be technically proficient and trained extensively to understand data and its importance in guiding a business's strategic plans. They should be able to navigate and contribute to an evolving regulatory landscape. And they should be comfortable managing the ongoing trade-offs of risk and reward. Actuaries are well-known for competency in these areas, and they also are backed by professional societies with impeccable reputations and experienced members that can help the FinTech industry mature and flourish.

Actuaries are among the most technically skilled of all professionals, and this analytical expertise is incredibly valuable for many FinTech companies. These companies employ teams of people—like those you might see within an insurance company—who build financial models, evaluate risk, monitor performance and modify products in response to market demand and emerging experience. The core analytical problem-solving process that comes so naturally to most actuaries can be a valuable resource for FinTech companies looking to iterate through new ideas.

Beyond their technical skills, actuaries can help FinTech companies manage the wider implications of rapid technological innovation, among them the complementary changes in regulation. There is already significant overlap in existing banking and insurance regulation, especially for insurance products that draw on elements from both industries, like variable annuities. Actuaries who helped craft regulation in the rapidly developing annuity markets of the 2000s, and those who continue to formalize principle-based reserving methodologies, could play a meaningful role in shaping the FinTech regulatory landscape.

Finally, a key strength of many actuaries is their ability to evaluate the trade-offs between risk and reward. A relative of mine who has spent his career in Silicon Valley once told me that the entire culture of Silicon Valley is based on taking risk. The young but promising industry of FinTech is no different. There is a risk of further setbacks like those that occurred in 2016, but its fundamental value proposition—that technology can be used to provide financial services more cost effectively than existing options, with a high degree of quality and personalization, and to a vastly wider population—is sure to have a lasting impact. Actuaries who think they understand the risks of moving to a career in FinTech might be concerned that individual companies will fail. But actuaries who understand the rewards of a career in FinTech can be confident they have a unique and valuable skill set that can be applied to some of the most exciting challenges in finance. From my perspective, the real risk is not taking a chance on FinTech. ■

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INDUST

DISRUPTORS

THE RISE OF DISRUPTIVE TECHNOLOGY IN INSURANCE

BY BRAM J. SPECTOR

"May you live in interesting times." Interesting times … We should all be so lucky, right? The real intent of the saying has a bit of ironic flair, as this expression is a play on the dichotomy of perceptions as to whether interesting times are exciting or disquieting. Ultimately, most common interpretations of this saying suggest that people prefer the predictability and order of uninteresting times.

Technology's pervasive, fundamental impact on society is triggering interesting times—both exciting and disquieting. Consider Netflix, one of the most notable modern examples of disruptive technology: As an avid movie lover, the ability to have movies show up in my mailbox, or better yet, access movies and on-demand content using nothing more than my TV remote control, was liberating and delightful. Those who saw the changing tides in the movie rental business and invested in Netflix early were handsomely rewarded, and Netflix now enjoys a market capitalization of roughly $65 billion (as of July 10, 2017). On the other hand, at its peak in 2004, Blockbuster had approximately 60,000 employees, 9,000 stores worldwide and a market value of $5 billion.[1] I can only imagine that those employees, franchise owners and stockholders found the rapid change and abrupt upending of Blockbuster's business model to be far from delightful.

While Netflix has radically changed the retail movie rental and content streaming industry, some might argue that Amazon is an even better example of disruptive technology's ability to reshape a landscape. Jeff Bezos' choice of name (based on the Amazon River, the largest in the world) reflected his intention to make his foray into the e-commerce revolution the largest "store" in the world. Having strategically narrowed down potential products to market and sell online, Amazon began with a singular focus on selling books. It proceeded to reshape not only the retail bookstore landscape, leaving established global companies like Borders and countless independent bookstore operators in its wake, but it also went on to upend the book publishing industry through the introduction of the Kindle e-reader.

Amazon rapidly diversified its product lines and enjoyed explosive growth, as traditional brick-and-mortar retailers struggled to adapt. Retailer bankruptcies have mounted, and the impact has been so pervasive that some analysis suggests that as much as half of the retail space in the United States will go vacant within a decade.[2] In the meantime, Amazon continues to diversify with adjacent innovations, such as its core e-commerce business spawning Amazon Web Services (a leading provider of on-demand cloud computing platforms); Amazon Music and Video, which eventually led to its development of original media content; and a significant foray into the connected home with its Amazon Echo line of smart speakers and voice-activated personal assistant service Alexa. It's also transforming logistics as we know it, to keep pace with the exponential growth of the demand for distributing the goods it sells.[3] And with the recent acquisition of Whole Foods, who knows what might be next.

Another powerful example of the potential for technology to fundamentally change a business model is the evolution of retail banking and payments. Many of us will recall the introduction of the automated teller machine (ATM); at the time, it was widely predicted that the ATM would bring the eventual demise of the bank teller. While bank tellers have survived, ATMs have augmented the teller's role and provide a more efficient means to serve customers' needs for routine tasks.

Fast-forward to today, and many of those same needs can be accomplished from the comfort of one's couch using a smartphone and a well-designed banking app. Checks have given way to e-payments, and with the click of a few buttons, one can easily deposit funds, pay bills or transfer money. When it comes to paying in the checkout line, it is becoming increasingly unnecessary to even reach into one's wallet to pull out a credit card, with the rise of mobile payment platforms like Android Pay, Apple Pay and Samsung Pay. The number of checks written in 2015 is less than half the number written 15 years

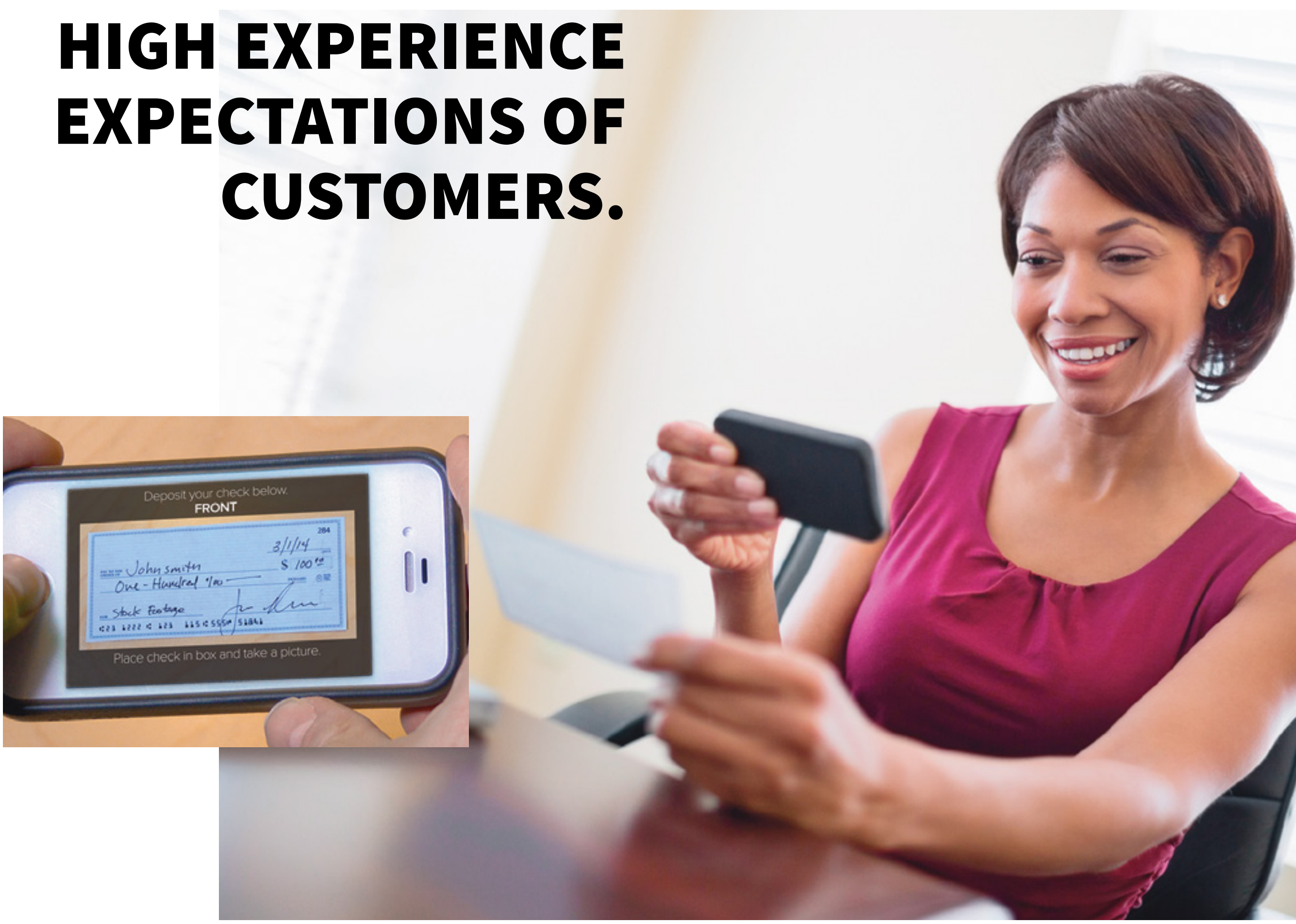
E-readers, like the one pictured, have disrupted the retail bookstore landscape and the publishing industry.

FINTECH IS EMERGING AND EVOLVING NOT ONLY AS A RESPONSE TO CONCEPTS LIKE CROWDFUNDING, MOBILE PAYMENTS, DISTRIBUTED LEDGERS AND THE LIKE, BUT ALSO AS A MEANS TO ENABLE THE INCREASINGLY HIGH EXPERIENCE EXPECTATIONS OF CUSTOMERS.

prior,[4] and cash has the potential to go the way of the check as credit card companies, such as Visa, have started pilot initiatives to incentivize and compensate merchants in a "journey to cashless" payments.[5]

WHAT IS INSURTECH?

These advances in the financial services sector of retail banking and payments are some of the more visible examples of what can more broadly and somewhat ambiguously be categorized as FinTech, or Financial Technologies. For lack of a better definition, we can think of FinTech as: Technologies used and applied in the financial services sector, chiefly used by financial institutions themselves on



the back end of their businesses. But more and more, FinTech is coming to represent technologies that are disrupting traditional financial services, including mobile payments, money transfers, loans, fundraising and asset management.[6]

FinTech includes both advances by traditional, established technology providers, as well as the emergence and entry of a wide array of startups that are looking to capitalize on this wave of change. FinTech is emerging and evolving not only as a response to concepts like crowdfunding (e.g., Kickstarter), mobile payments (e.g., Square), distributed ledgers (e.g., Blockchain) and the like, but also as a means to enable the increasingly high experience expectations that customers have in a world where companies like Amazon and Uber have set, and continue to raise, a high bar. Customers expect to buy products and services with a few clicks using an intuitive and simple user interface, and have instant gratification in executing the purchase. The impact of these types of customer expectations and the rapid evolution of technology are bound to permeate throughout all industries.

This brings us to the insurance industry. Many insurance companies, much like other established financial services institutions, have proud and successful legacies of serving policyholders and customers for a century or longer. Insurance companies, like virtually all companies, embraced the internet era and evolved and innovated to open new markets, channels and even new business models. We now stand at a pivotal juncture in time when some of the most significant advances in evolving the insurance business model are occurring. These advances fall into a broad category of new technologies referred to as InsurTech. InsurTech is poised to disrupt all forms of insurance, and it has the potential to impact most if not all aspects of the insurance business model.

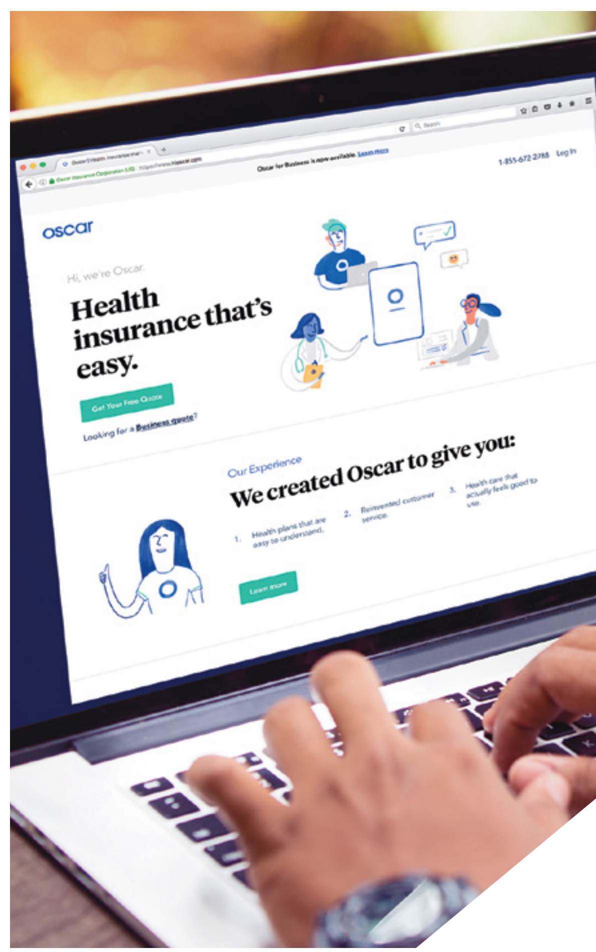
To begin exploring InsurTech, let's examine an example in three major categories of common insurance (in no particular order).

Health Insurance: Oscar

Upon visiting Oscar's website, one is greeted by: *Hi, we're Oscar. Health insurance that's easy. We created Oscar to give you: 1) Health plans that are easy to understand. 2) Reinvented customer service. 3) Health care that actually feels good to use.*[7]

Imagine if technology veterans from Silicon Valley built a health plan from the ground up, unencumbered by decades of legacy technology. That is essentially what Oscar sought to do when it launched in 2014, funded by well-known venture capitalists and founded by executives from the likes of Microsoft and Google. It was built from the ground up, with the intent of creating simple health care plans that are easy to understand, bills that are easy to access and read, and a simple website and mobile app that make it easy to access information

Visitors to Oscar's website (pictured here) are greeted with a simple message: Oscar offers health insurance that's easy.



and services—thus greatly improving the experience of interacting with the health care system.

Behind the scenes, Oscar is working to unlock the power of the data it is quickly accumulating, and it is applying cutting-edge data science to "optimize" the provider network its customers access. The objective is not to offer a smaller network, but a smarter network.[8] Oscar, like other health plans, seeks to pivot to an environment where data can inform health care consumers about which providers deliver high-quality medical care at the best value.

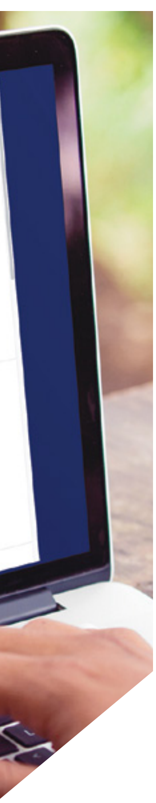
POLICYGENIUS OFFERS USERS EDUCATION ON INSURANCE AND PROVIDES DECISION SUPPORT IN THE FORM OF ROBO-ADVICE, MAKING THE SITE MUCH MORE THAN A PRICE-COMPARISON TOOL.

Life Insurance: PolicyGenius

With a flair for superlatives (as in its name), PolicyGenius's website bills itself as: *The easiest way to find affordable term life insurance online. Experts if you need them. Technology for everything else.*[9]

The founders of PolicyGenius set out with the goal of bringing the insurance-buying process—from education to shopping to application—to the modern internet-savvy consumer. This ambition was based on the premise that the same simplicity that TurboTax software brought to personal taxes could be achieved in the complex process of picking and purchasing life insurance.[10]

While the age-old adage—that insurance is sold, not bought—still applies, PolicyGenius seeks to provide an alternative to the traditional face-to-face insurance agent sales process and deliver an intuitive and easy-to-understand online application process. It offers users not only education on insurance, but, when necessary, it provides decision support in the form of robo-advice on what insurance needs the specific user may have and how best to fulfill those needs, making the site much more than a price-comparison tool.



Some research shows that the average age of life insurance agents is 59 years old, suggesting a retirement cliff may be imminent. PolicyGenius is not only a response to the changing shopping and experience expectations of consumers, but it is also positioning itself to capture a growing share of insurance distribution as the supply of agents changes.

Property Insurance: Lemonade and Trov

Through 2016, the property and casualty (P&C) insurance sector has received the most attention from the InsurTech investment and startup space. With so many interesting examples of innovation, it was hard to pick just one to examine. So first up, Lemonade: *Forget Everything You Know About Insurance. Instant everything. Killer prices. Big heart.*[11]

Lemonade provides renters and homeowners insurance for urban dwellers and uses its artificial intelligence bot to help guide users through the choices necessary to select the right insurance. Its website suggests that it takes as little as 90 seconds to get insured, and as little as three minutes to file and get a claim paid.

Lemonade is not only seeking to appeal to the growing insurance customer base of millennials through a simple user experience, it is also seeking to differentiate itself as being rooted in the principle of social impact. Lemonade aspires to change the insurance paradigm and remove what it believes is an inherent conflict of interest between the insurance company and the policyholder: that every dollar paid out to a policyholder in claims is one less dollar of profit to the company. This conflict leads to mistrust and misalignment of incentives.

To circumvent this conflict, Lemonade established itself as peer-to-peer insurance. It only keeps a fixed percentage of premiums to cover expenses and profit, and all remaining "unclaimed money" is given to a cause (e.g., nonprofit charity) of the policyholder's choice. Based on its behavioral economics research, this results in a relationship founded on trust and eliminates claimant fraud, allowing the insurer to pay claims more quickly and minimize claims leakage. It also minimizes the time and effort necessary to review claims, which in turn drives down operational needs. Both of these factors help drive down costs and lower premiums, to the ultimate benefit of policyholders.

Trov, a company also focused on reimaging property insurance, is taking a different approach: *On-Demand Insurance For The Things You Love: Protect just the things you want—exactly when you want—entirely from your phone.*[12]

Trov is the insurance industry's answer to the rapidly growing on-demand economy (e.g., Uber, Airbnb, Instacart). Trov's mission is to simplify the insurance process and enable its customers to insure only the items they want and only at the times they want. This maximizes protection for when it is needed most, and it minimizes premiums by eliminating the need to pay for times when the property is not at risk.

Trov's CEO sees his company unbundling coverage for single items as similar to the way Apple unbundled music albums with iTunes.[13] Trov enables its unique form of insurance using a mobile app, which allows the user to turn on or off protection from accidental damage, loss and theft simply by "swiping" left or right. The claims process is completed via text messaging, and it is designed to be entirely mobile.

TROV'S CEO SEES HIS COMPANY UNBUNDLING COVERAGE FOR SINGLE ITEMS AS SIMILAR TO THE WAY APPLE UNBUNDLED MUSIC ALBUMS WITH ITUNES.

WHAT DOES IT ALL MEAN?

These case studies represent just a small slice of the startups, disruptors and InsurTech firms looking to shake up the insurance industry. In fact, while these case studies generally represent some of the larger InsurTech firms—and three of the four cases are insurance companies—in most cases, InsurTech firms are more singularly focused on solving or improving one critical aspect of the insurance business model, like in the case of PolicyGenius. There are InsurTech startups, big and small, looking to solve fundamental problems or improve the experience in virtually all aspects of the insurance business model. While keeping count of the number of InsurTech firms is virtually impossible, by all accounts the number in the United States alone is in the hundreds. With total investments in InsurTech exceeding $2 billion in both 2015 and 2016, and with funding increasingly coming from the corporate venture capital arms of established insurance companies, it looks as if InsurTech is here to stay.[14]

While the pace of change has been, and certainly will continue to be, a topic of great debate, it is difficult to argue against the fact that change is in the air. There is no question that the Amazons and Netflixes of the world took years to establish dominance, but those who early on dismissed these examples of disruptive change certainly did so to their own detriment, if not demise. Which brings us to the last question …

WHAT SHOULD I DO?

Presuming that you, the reader, work in a traditional insurance setting, one option might be for you to pack up, move to Silicon Valley, buy a hoodie, take a crash course in coding and stake your claim by putting into action whatever brilliant ideas you may have on how to improve, disrupt or radically reshape the insurance business model. If that is your ambition, I'm impressed. But the remainder of this article won't be of much help. Assuming what I just described is not your desire, but you are interested in exploring the world of InsurTech, then there are a few other steps you could consider.

STEP 1

Start tracking the InsurTech space. I started casually monitoring news, investments and select firms in the InsurTech space in early 2015 when a client introduced me to this space. I was inspired quickly by the relentless focus on problem-solving, the commitment to improving and changing the way things are done, the risk taking juxtaposed with the recognition that failure is OK (as long as one fails small, fails early and learns from these failures), the nimble nature of startups (with timelines measured in days or weeks, not months or years) and more. I started viewing InsurTech firms as point solutions to critical problems in the insurance value chain, and my colleagues and I started compiling the various use cases that InsurTech firms were working to solve. As you track the space, you will undoubtedly be inspired in unique ways, and you might take what you learn and find ways to put that into action in your day job.

STEP 2

Consider how the principles that InsurTech startups are using to differentiate themselves might be applied to your company and your slice of the insurance world. Customer experience is critical, and it's easy to point to this as the first place to focus. However, focusing on this alone would be missing the bigger picture of InsurTech, which often involves bringing together numerous principles. Maybe how telematics is changing auto insurance is of interest to you, and you want to brainstorm ways the Internet of Things and sensors can be applied to other forms of insurance. Perhaps you have creative ideas on how robo-advice can be used to simplify the benefits enrollment process. Or maybe you've solved all the underwriting and claims problems that exist in your company, and you want to think about some of the other business problems that analytics-focused InsurTech firms are working on. The possibilities are endless.

STEP 3

Get excited, take a risk and plot an experiment. InsurTech firms frequently talk about "pilots" and "proofs of concept." Unlike traditional "projects," the idea is to start small, prove an idea works, demonstrate value quickly and build momentum. The cost and timeline is small; if the idea doesn't pan out, it's no big loss. If the idea proves worthwhile, it can be subsequently tested on a larger scale, or implemented in a small-scale live rollout to continue the testing and refine the concept. This approach isn't meant to circumvent the traditional and rigorous project governance or software development lifecycle that may exist and apply within an organization, but it is simply meant to be a way to incubate ideas quickly and efficiently before rolling them out through formal processes.

But most important, be open to change! Netflix and Amazon both have continued to change as technology in the world around us continues to evolve.

These are my impressions, observations and recommendations. If you agree, disagree or want to discuss, please drop me a line or find me on social media. ■

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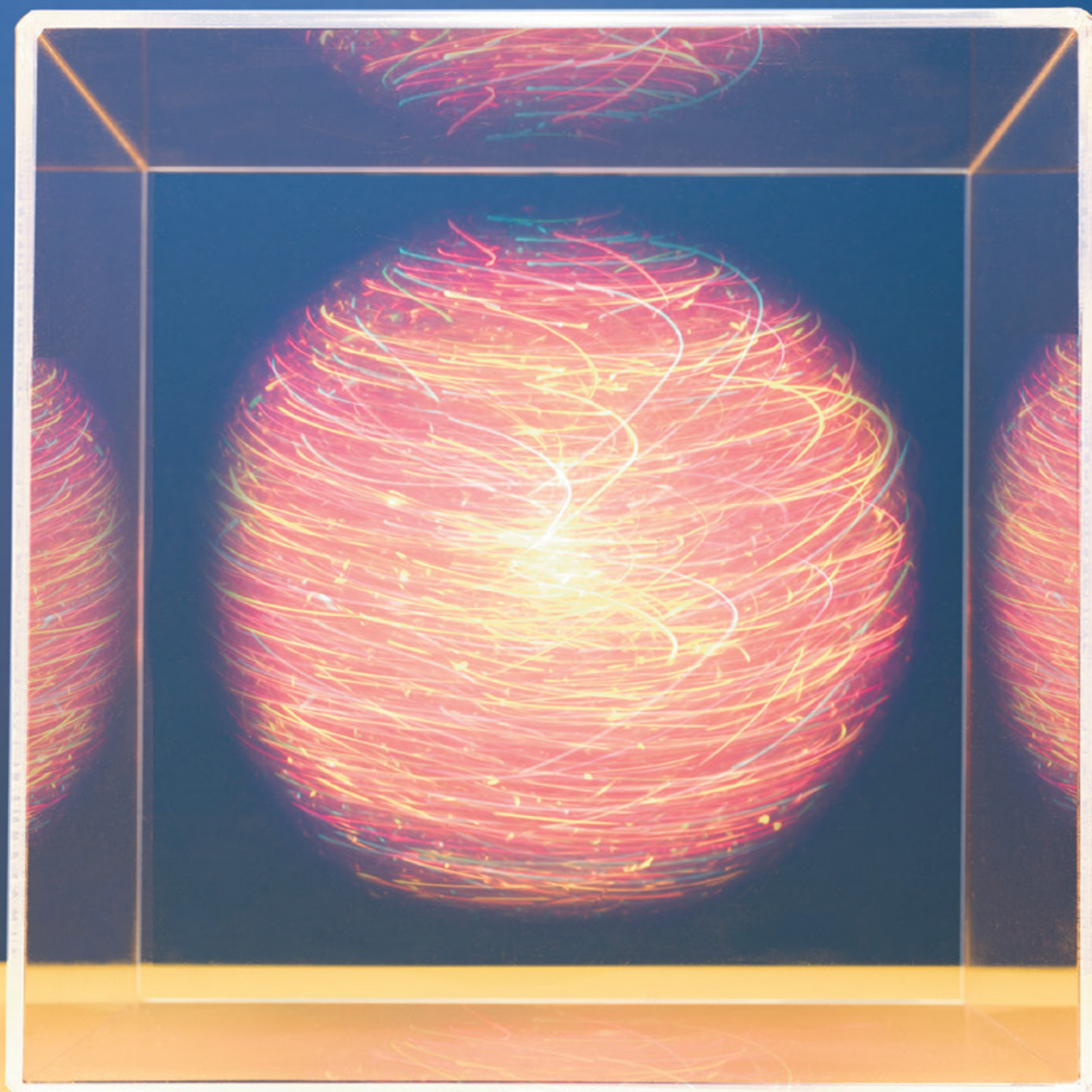


RELEASING INSPIRATION

A STORY OF COLLABORATION, INNOVATION AND SAYING GOOD-BYE TO THE FAX MACHINE!

BY JASON T. ANDREW

I have a lot of love for the insurance world, having worked in a variety of roles in insurance for the past two decades. Though I love our industry, it has been notoriously slow to respond to technological innovations that improve the way things have always been done. The insurance industry is complex and intricate, fraught with poor user experiences, low literacy, lack of transparency and heated political challenges. It is also nearly 7 percent of the entire gross domestic product (GDP) in the United States.

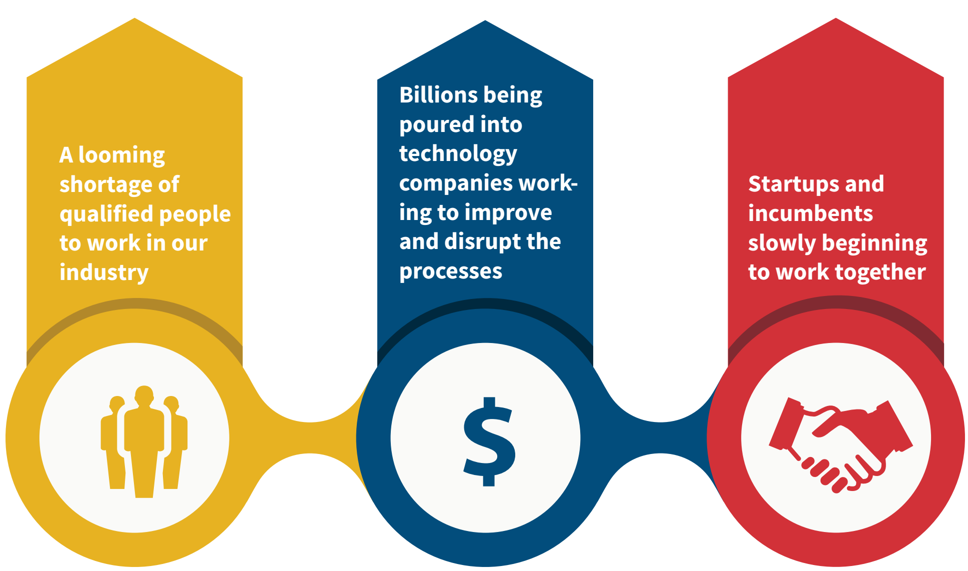
Unfortunately, while the world rapidly adopts ever-changing technology and the use of automation for daily activities, the employee benefits industry is operating as it did 20 years ago in most places. The tools commonly used by insurance professionals remain unchanged—Microsoft Excel, paper applications, wet signatures and even fax machines! Recently, however, the sun has begun to rise on the insurance industry, and there are positive signs of change. These innovations are most obvious at the front end of health care, where health payment solutions, data analytics tools, telehealth, wearable devices, and other products and services are addressing the needs of businesses and consumers.

But equally important and powerful is what's happening behind the scenes, in the health care system's back-end infrastructure. This "unsexy plumbing," as it has been called, makes the front-end advances possible. For technology innovators, this plumbing also presents myriad opportunities to reduce costs, streamline processes and shape the future of this industry that affects all Americans.

There are three sweeping changes taking place in the insurance industry:

1 | A looming shortage of qualified people to work in our industry
2 | Billions being poured into technology companies working to improve and disrupt the processes
3 | Startups and incumbents slowly beginning to work together

THREE CHANGES TAKING PLACE IN THE INSURANCE INDUSTRY



> "The advantages of embracing InsurTech are clear—it is essential that employee benefits players modernize, collaborate and change."

A LOOMING SHORTAGE OF QUALIFIED WORKERS IN EMPLOYEE BENEFITS

Seasoned insurance agents are rapidly exiting the industry. According to McKinsey & Company research, one in four agents will retire by 2018, and the agency market is expected to have a serious shortage of agents.[1]

- The average age of a U.S. insurance agent is 60.
- Twenty-five percent of the industry's workforce is expected to retire by 2018, with 35 percent projected to retire by 2020.
- Agencies need to hire three young producers for every producer currently employed.

This means we have a massive shortage of brokers—both e-brokers and traditional. Are you ready for this industry turnover? How will you scale to attract and retain the next generation of insurance professionals entering the workforce? How do we attract qualified talent and inspire a new generation to build their careers in this industry?

Now is the time for insurance businesses, brokers and carriers to find ways to attract and recruit new talent and, in the process, modernize their business workflow and integrate technology platforms and standards.

MONEY IS POURING INTO THE INSURANCE SECTOR

InsurTech investments between 2014 and 2016 alone generated more than $10 billion for startups. This does not include the additional investments made by mature and established insurance companies that updated or revamped their technologies. KPMG notes that it expects investment interest in InsurTech to remain "hot" throughout all areas of the world in 2017.[2] InsurTech companies are working to solve the pain points within the industry, offering new data sources, providing new possibilities for underwriting, increasing customer focus and attempting to reduce costs substantially. These companies have the ability to transform the operational practices of the insurance industry, which benefits everyone.

More than 60 percent of all InsurTech deals have involved companies that specialize in some type of insurance automation. For example, one startup, CynoClaim by Outshared, is enabling 60 percent of claims to be managed automatically through digitization and automation, allowing processes and functions to become cheaper and more efficient.[3]

Oscar Health Insurance recently partnered with an established insurer, Humana, to blend its technology with an established distribution network. In addition, Oscar pulled in startup and wearable-device company Misfit to reward healthy customers by automatically linking their biometric information to their health insurance. The advantages of embracing InsurTech are clear—it is essential that employee benefits players modernize, collaborate and change.

STARTUPS AND INCUMBENTS WORKING TOGETHER

As I mentioned, I have worked in this industry for almost 20 years. We started Limelight Health after years of frustration working as insurance agents in employee benefits and experiencing firsthand the inefficiencies and redundancies in our everyday work. Taking just one area of the workflow—quoting and enrollment, for example—we saw that far too much time was spent on these manual administrative tasks.

So we started with a few simple questions:

- Why is it so hard to simply get a quote from a carrier?
- Why is underwriting so antiquated and "secret?"
- Why is it not easier to explain the products to a customer?
- Why don't we have a standard to enroll employees?

How do we solve these problems? How do we provide an enjoyable user experience and make these processes efficient? As we began the journey, we quickly found there are very few standards. Due to legacy technology and a lack of access to underwriting and rating logic, building a good user experience and connecting systems is a daunting task.

Purchasing a medical, dental, vision, life, disability or cancer product is one of the most important decisions that directly affects our nation's workforce. Employee benefits are a major factor for 60 percent of people when considering whether to accept a job offer.[4] It seems that health insurance, being so personal and so relevant to most of the general population, would warrant a mutually beneficial, seamless process for which to procure, compare, choose and enroll—with the right data and tools within easy reach of the user.

This brings us back to the initial question: How do we do a better job getting major established players in the insurance industry to embrace and work with early-stage startups? The typical sales cycle can be 18–24 months, and this time can spell death to a startup working on an 18-month cash runway. Often, for example, large carriers need to make decisions with a committee of 20 people. Even when there is an innovation team or a strategy officer, these people are not empowered with the budget and decision-making authority to do a paid pilot or proof of concept. One suggestion is to create an innovation center with its own budget and provide it with a leader who takes lean startup concepts of "failing fast," and invest in startups with solid proofs of concept that show potential to become full deployments.

The second glaring need is for a common set of standards. It's been much more difficult than we expected to scale our company because of the lack of nationwide standards for group rate and benefit data. In other sectors, including telecom, banking and FinTech that preceded the current InsurTech transformation, there was an emphasis on creating similar technical standards across the board. As a result, many companies can innovate and provide financial services and solutions with the click of an app because you can connect to every financial institution's set. It's impossible to build a technology platform that works for everyone unless there are the infrastructure and standards to support it.

There has been some progress in a few areas with regard to InsurTech. For example, at the public level, health information exchanges, such as the California Integrated Data Exchange (Cal INDEX) and the Statewide Health Information Network of New York (SHIN-NY), are working to gather and share health data with the goal of reducing costs, increasing efficiency and, ultimately, improving the quality of care.

The Meaningful Use standards established by the Centers for Medicare & Medicaid Services (CMS) are another example of the government's role in promoting data integration. By offering payment incentives to health care providers and organizations, CMS encourages the implementation and "meaningful use" of health care information exchanges and qualified electronic health records (EHRs), among other objectives. While it's too soon to gauge the program's full impact, the incentives ultimately should lead to an expanded use of interoperable data, which in turn will support improved care and outcomes. That being said, this pertains to medical records, which is just one aspect of data standards. To my knowledge, there has been little work done when it comes to rating, underwriting and plan availability standards.

Under the Affordable Care Act, which currently is being dismantled slowly, we have public use files for small group medical products when filed by insurance companies. This includes some products like medical, dental and vision.

WE WILL BE OF GREAT BENEFIT TO ALL PEOPLE AS WE MOVE TOWARD A TOMORROW THAT PROMISES GREATER LONGEVITY, MORE AUTOMATION AND A BETTER-INFORMED SOCIETY.

But even this data is not consistent with final sold plans and rates.

WHY IT MATTERS

Fifty percent of all bankruptcies happen because someone doesn't have the ability to pay for medical expenses.[5] This is directly related to health insurance coverage. Most people have no clear understanding of how important medical, dental, vision and disability coverage is, and the impact it can have on their lives.

For example, "While about three out of four Americans aged 22–64 believe they know how to use health insurance, only about one in five could correctly calculate how much they owed for a routine doctor visit, according to findings from a national survey by AIR designed to measure health insurance literacy."[6] In addition, we often talk about bringing down the costs of coverage, yet a staggering $400 billion is lost every year to waste and inefficiency, simply as a result of the use of paper records![7]

Often, we travel along the path of life with no clear understanding of what coverage we have and what coverage we lack. We typically don't pay attention until something terrible happens (e.g., an accident, illness or a death of a loved one). A secure health care benefits strategy would help provide some stability while going through hard times with one less thing to worry about. If we don't work to get standards and provide a better user experience that is data driven, there is no way we will be able to address some of these crucial, often life-changing problems in our industry.

We live in a moment of opportunity. If we, as players in the insurance community, can take a deep breath, dive into the murky waters and work together to find new solutions to these issues, we will be of great benefit to all people as we move toward a tomorrow that promises greater longevity, more automation and a better-informed society. ■

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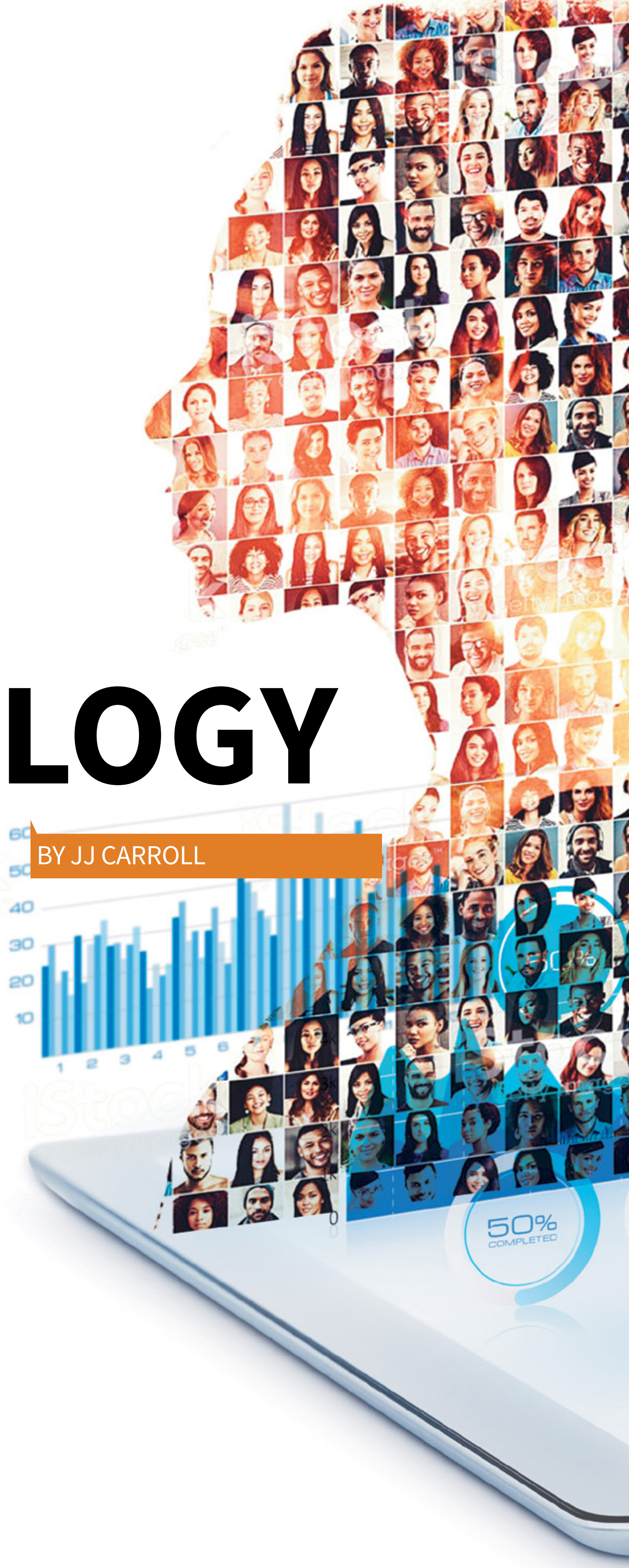
BEYOND TECHNOLOGY

EXPLORING THE APPLICATIONS OF INSURTECH IN A HUMAN WORLD



BY JJ CARROLL

Twenty years ago, drama in the insurance industry was limited mainly to the conflict between the actuarial and marketing departments over the price of products. InsurTech has thrown our industry into a whirlpool of exciting—and sometimes scary—opportunities. There are now far more interesting considerations than price alone. Digital natives have changed expectations. Data and new technologies have created amazing possibilities. As important as technology is to the reinvention of our industry, human considerations are key to the ultimate success of InsurTech.

Actuarial science has always been a blend of technical and social sciences. The future increases in both data volume and variety will require actuaries to have a familiarity with techniques in machine learning, data mining, image processing and predictive analytics. The ability to effectively apply these learnings and outcomes will require familiarity with behavioral economics and ethnography. Based on their in-depth knowledge of the industry, actuaries have a unique opportunity to enable successful integration of technology across all areas of insurance.

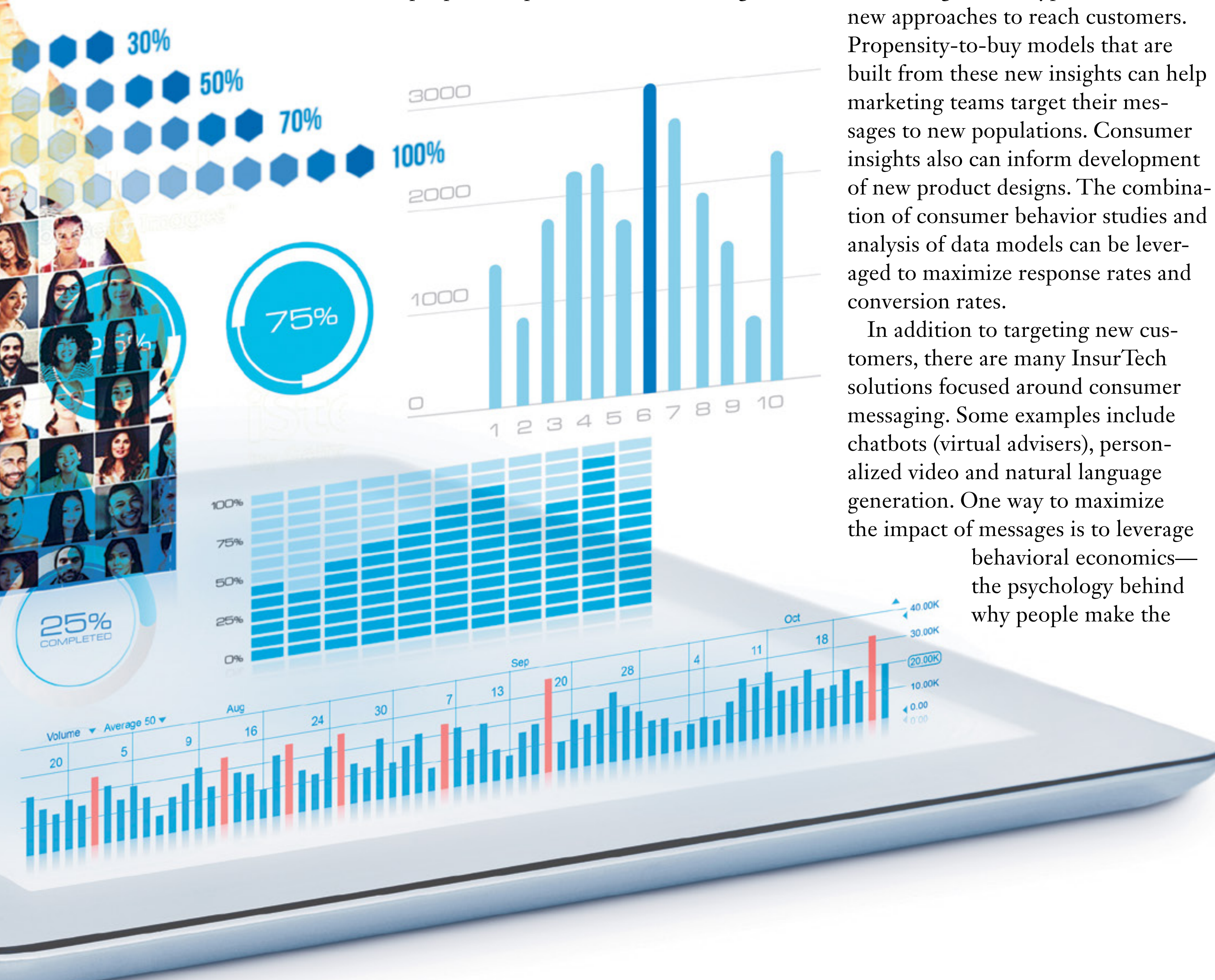
MARKETING AND DISTRIBUTION IN A BIG DATA WORLD

One of the hottest areas of InsurTech is insurance marketing and distribution. Insurers are faced with increasing amounts of data about their customers or potential customers. Actuaries are perfectly positioned to help interpret this data and identify relevant trends and implications for product design and customer solutions.

One of the biggest challenges for actuaries to tackle is the propensity to buy insurance. Traditionally, propensity-to-buy modeling requires analyzing the purchase behavior and characteristics of people who purchase insurance. The idea is that by better understanding the people who have insurance, actuaries will be better able to target similar people and have a better chance of being successful in their marketing efforts.

But that approach limits the possible scope of target marketing. Try supplementing this by flipping your way of thinking. For example, why not learn more about the people who aren't buying insurance?

Ethnography, or the science of observing human behavior, is used increasingly in business to develop hypotheses about consumer behavior and motivations. Observation provides deeper insights than surveys, because people don't always know how to articulate what they want or accurately reflect how they would behave in a real setting. Marketing teams use these insights and hypotheses to build new approaches to reach customers. Propensity-to-buy models that are built from these new insights can help marketing teams target their messages to new populations. Consumer insights also can inform development of new product designs. The combination of consumer behavior studies and analysis of data models can be leveraged to maximize response rates and conversion rates.



In addition to targeting new customers, there are many InsurTech solutions focused around consumer messaging. Some examples include chatbots (virtual advisers), personalized video and natural language generation. One way to maximize the impact of messages is to leverage behavioral economics—the psychology behind why people make the

buying decisions they do. This involves testing hypotheses about the context in which the messages are presented and how this shapes human decision-making. As an example, in one test conducted by Swiss Re's Behavioral Economics team, they saw a 168 percent increase in open rates simply by changing the subject line of the email. This is an extreme example, but it has been consistently shown that small and inexpensive changes in messaging can make a disproportionate difference in outcomes. Behavioral economics is an important consideration in optimizing the impact of technology solutions for marketing efforts.

UNDERWRITING AND DATA

Increases in availability of information create a plethora of modeling opportunities for actuaries. Predictive analytics is a term widely used to describe the use of new data sources to underwrite cases more quickly. New analytics techniques make it possible to work with increasingly large and varied data sources. Data is derived from sources such as healthy behavior indicators, credit histories, public records and appropriate digital profiles. Health records, now increasingly available digitally, and image analysis, which is advancing rapidly, can now be added to the data mix. The pace of growth in types of available data challenges an actuary's ability to identify and synthesize trends, and our skills and thinking will need to evolve accordingly.

Certainly, a big part of the human side of data relates to issues of fairness, transparency and data privacy. But it can also be about what consumers want from the buying process. Predictive underwriting usually is considered in the context of simplifying the transaction, but consider the possibilities if we think of it as a buying experience instead of a transaction. Some consumers find the process more credible if it's rigorous. Because life insurance is an investment in a family's future, consumers feel more confident when insurers take this concern seriously by providing a process that is both rigorous and secure. Others wish the experience was interactive because they value the ability to share their individual story.

There is a lot of information actuaries and underwriters collect that could provide interesting feedback for consumers. Some new property insurance products, for example, integrate services like warnings when a hailstorm is approaching, or recommendations on how their driving compares to others like them. By investing in understanding what consumers want most from the buying experience, actuaries can design products that use data to deliver greater value.

RETENTION

One of my favorite aspects of the life insurance industry is the alignment of interest between the insurance company and the end consumer. Both want the insured to lead a long, happy life. Many insurance companies are considering ongoing engagement programs revolving around wearable devices or coaching for chronic conditions. In addition to the altruistic benefits, there is some real financial incentive as well.

Consider this simple calculation to explore the financial impact of a behavior change that creates a

IF WEARABLES OR SENSORS BECOME PREVALENT AND PROVIDE A LONGITUDINAL VIEW OF THE CHANGING RISK PROFILE OF POLICYHOLDERS, WHAT CAN OR SHOULD BE DONE WITH THAT INFORMATION?

successful long-term change to an individual's mortality: Take into account a health intervention that results in a 1 percent mortality improvement for all future durations. The savings in present value of death benefit for an average 45-year-old male duration 5 with a $250,000 universal life insurance (UL) policy would be roughly $80. The savings increases with age, face amount and relative risk, and can vary further based on product design. Policyholder engagement or interventions are also likely to have an impact on persistency. The nature of the financial impact of that change will vary depending on factors such as product type and duration.

Such an analysis can support a business case for investments in technological engagement. The analysis also highlights the importance of achieving the desired behavioral change. Mortality improvement requires long-term improvements in healthy behavior. However, principles of behavioral economics will tell us that incentives built around long-term goals like a longer, healthier life are not as effective as incremental short-term achievements related to everyday life. Actuaries can be involved in interpreting which types of interventions have the greatest impact on behavioral change and, therefore, mortality improvement. Success will depend on the context around how programs are implemented and how they're communicated to consumers.

As the quantity and type of available data changes, actuaries need to consider not only the implications for product design, but also ethical considerations. Insurance is a product that can only be bought before you need it, and consumers rely on protection coverage to be there when they do need it. For example, if wearables or sensors become prevalent and provide a longitudinal view of the changing risk profile of policyholders, what can or should be done with that information? What are the implications of early detection of disease? Do insurers have any obligation to share insights about a policyholder's risks? Is it an increased opportunity for service-related products to be developed?

Ultimately, the basic purpose and function of insurance is solid, but the delivery and engagement mechanisms need modernization. It is important for actuaries to keep up with new technologies to support the increasing variety and volume of data. By collaborating across the business, actuaries can help ensure the success of new InsurTech-driven products. Companies with a solid understanding of how people's daily lives translate into the digital world will have a strong competitive advantage. ■

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AN INSIDER'S VIEW TO BEING AN ACTUARY AT AN INSURTECH STARTUP

BY RYAN HINCHEY

"Every day I hear massive clapping at 2 p.m., and it lasts for 30 minutes. What on earth goes on at your office?" asked one of the fellow tenants at our Mountain View, California, office building, located just down the road from Google.

I explained to her that my company, Health IQ, has a daily companywide stand-up meeting that is a unique part of our culture. Every day our 100-plus employees gather in our two offices, connected via a Skype feed, and one by one we tell our colleagues about an achievement we had in the last 24 hours. If it's clap-worthy, the entire company will give a round of applause.

It's all part of a culture that celebrates employee successes every day. And this is part of the broader mission of Health IQ, which celebrates the health conscious with social and financial rewards, such as lower-priced life insurance for runners, swimmers, weightlifters and vegans.

The mission of Health IQ is due to our founders' previous health challenges. They come from backgrounds as very successful entrepreneurs; however, with so much focus on business success, they found they had neglected their personal health. With Health IQ, they set out to change that by building a company that celebrated the health conscious, and they launched a popular health literacy quiz app in 2014.

Today, Health IQ has evolved into an InsurTech life insurance agency that focuses on servicing the insurance needs of the health conscious. We have worked with forward-thinking insurance companies to create unique products that reflect the lower mortality and morbidity of the health conscious based on their dedication to living a healthy lifestyle.

your practice

GETTING IN THE DOOR

I have worked as an actuary for 15 years in a variety of roles at large insurers and in consulting for companies in the United States and Europe. However, Health IQ is nothing like anything I've experienced before. When I first heard about the startup, the culture and the innovative business model both piqued my interest. A healthy diet and exercise have always been a part of my life, so the mission resonated with me. As an actuary, working with big data to take an innovative approach to insurance pricing was exactly the type of intellectual challenge I was seeking.

However, as I found out during the interview process, an important part of building a strong company culture is to be very strict about who is hired. During the eight-week interview process, I discussed my healthy lifestyle with the CEO; wrote a "brag sheet" describing every worthy professional, academic and health-related accomplishment I've achieved in my life; and completed two actuarial projects to prove to a group of nonactuaries that I could execute on the level of work they required.

But once I made it through the door, I found myself working with a group of like-minded individuals. Not only were my colleagues the best and brightest in their fields, they all shared a similar passion for living a healthy lifestyle. This makes it easy for all of us to rally around this common cause.

WALKING THE TALK

As a company, it's one thing to talk up culture. But it's an entirely different thing to back it up by financially investing in the health of its employees. I'm proud to say that Health IQ walks the talk.

In both of our offices, we've constructed a "Ninja Warrior" course, along with a spin area and yoga room. After our companywide stand-up meeting, all employees have the option to work out as they choose—family-style, as we call it. On any given day, we have different groups engaging in weightlifting, cross-fit, spinning, yoga, biking and running. Because the company recruits the health conscious as employees, we have trainers, yoga and spin instructors, and collegiate champion athletes among us—there is no shortage of colleagues to lead workouts. Don't get caught with sugar in the office, as this is considered contraband at Health IQ.

Having a midday workout with my peers is beneficial on many levels. For one, it allows me to get to know people at my company with whom I wouldn't typically work closely on a day-to-day basis. It builds camaraderie, acts as a unique recruiting tool and is a way to retain employees when so many companies are trying to poach the best talent in Silicon Valley.

Because our customers are the health conscious, we can build deeper, more personal relationships with them by having so much in common and an understanding of what drives them. As our sales experience emerges, I've seen this affinity connection lead to significantly lower lapse rates than what is observed in the industry as a whole.

WEARING MANY HATS

During the two years I have worked at Health IQ, I have had the opportunity to wear many hats as our business has evolved. In the early days, I performed experience studies on the health conscious to quantify the improved mortality that comes from living a healthy life, applying this data to understand how it affects pricing. Being the first actuary, it was on me to build out our internal models in R.

When we began selling life insurance as a distributor, I set up a robust compliance department to ensure all agents were trained properly and following all applicable regulations.

At one point, we needed additional case managers, so I took on the task of hands-on managing the post-sale life insurance application process. This gave me the experience of working with carriers' underwriters to get policies approved and communicating with customers on the status of their application. As a result, I gained a very different perspective on the underlying steps in the application process that is extremely valuable when designing a new product from the ground up.

NEW CHALLENGES: WORKING FAST IN A SLOW INDUSTRY

One of the challenges of working at a startup in the insurance space is living in two very different worlds at the same time. Startups move at lightning speed as they invent new products and business models, and then rapidly evolve them as they gather data on how consumers respond with their wallets, pivoting as necessary. In contrast, I'm sure I'm not surprising anyone by stating that the insurance industry moves very slowly. Projects and resources are planned months or even years in advance. Important decisions take time and are seldom rushed.

Living in these two worlds simultaneously can be a real challenge to manage internal stakeholders who expect fast progress with the realities that a large organization can take a month or longer to make a decision.

I have found that educating both sides is the best way to manage expectations. Internally, my colleagues are now more aware of the timing at big companies. At the same time, with insurers, I have shown how new product concepts

can be brought to market quicker than they realize, and that we can make modifications over time to improve sales and profitability by accumulating data—all while playing within the boundaries of insurance regulations.

When working with nonactuaries, I have learned when I am asked to provide an analysis to answer a business question that I need to evaluate what the priority is: speed or accuracy in the details. There are clearly times when a detailed analysis is required. However, there are other times when a back-of-the-envelope answer will do, as speed is more important than precision at times. At first this felt unnatural—especially when I knew I could build a model that can give a very precise answer—but at startups, imperfect information is a reality when driving business decisions in a new market. Failing quickly and learning from the experience can be more valuable than being slow and thorough in executing an idea.

I've seen firsthand that insurance does not need to be the commodity that some may perceive it to be. Creating products and experiences around what's important to an audience can create a much deeper relationship and more loyal customers. While insurers may feel limited in how they can build more personal relationships with their customers, the sky is the limit when they partner with the right startup.

It's been two years since I made the career change to join an InsurTech startup. However, with the speed and intensity of the work, it feels like I've had four years of learning and development. The opportunity to see the sales process from product idea to creating marketing strategies and ultimately training agents on how to sell the products gives me a much broader perspective than when I stepped into this role. The ability to work with big data to create unique pricing, while also learning from nonactuaries, has allowed me to see the industry through different lenses. ■

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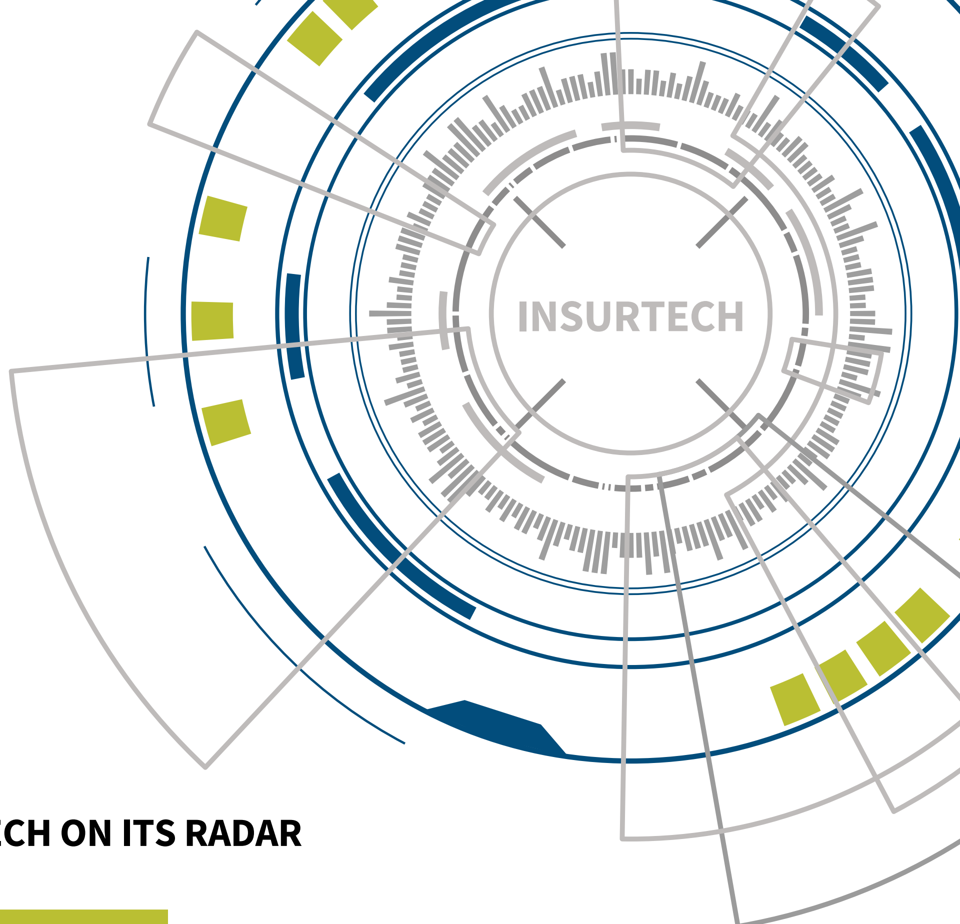
THE SOA'S VIEW



THE SOA BOARD HAS INSURTECH ON ITS RADAR

BY EMILY KESSLER

As part of the 2017–2021 strategic plan, the Society of Actuaries (SOA) Board committed to "identify, analyze and prioritize responses to [change] in a timely manner" (Objective 9 of the SOA Strategic Plan). To do this, the SOA is actively scanning the environment for changes, and the Board is holding generative conversations about emerging issues. The Board's goal is to gain insight on and respond to the challenges and opportunities facing the actuarial profession.

The SOA is already responding to one facet of the InsurTech revolution: the rise of big data and predictive analytics. Big data and predictive analytics are transforming the work of actuaries. We've incorporated these topics into our prequalification education system beginning in 2018. The Strategic Plan designates expanded and new roles for actuaries in predictive analytics as an objective (Objective 8). During a March 2017 discussion on InsurTech, the Board focused on the broad sweep of forces driving InsurTech—the combination of new technologies and new players—that may change opportunities for actuaries.

The Board reviewed and discussed a report issued by the International Association of Insurance Supervisors (IAIS) in February 2017 titled *FinTech Developments in the Insurance Industry.* The IAIS report considers how the combination of emerging technologies and new business models might change the insurance industry. It explores three scenarios:

1. Insurers incorporate new technologies and maintain customer relationships. Insurance is offered by the insurers of today (or their successors), but technology revolutionizes how that insurance is designed, managed and sold.
2. Insurance value chain becomes fragmented; insurers no longer are in control. In this scenario, insurers still carry the risk, but they're behind the scenes ("white-labelled"). Consumers purchase insurance as part of larger technology packages (e.g., fire insurance as part of a high-tech home safety system that lets you know which lightbulbs need changing, monitors for water damage and calls the fire department if the smoke alarms go off).
3. Big technology firms usurp insurers by leveraging their technological and analytical expertise. This is the "run fast and break things" model where technology companies come in and take over the insurance industry. One analogy is how Uber and Lyft have disrupted taxi service. While this disruption might not happen suddenly, it could lead to major changes in the insurance corporate landscape.

The SOA Board discussed how each scenario might change opportunities for actuaries. The board members considered what opportunities might be opened, closed or changed. They raised a number of questions, including:

- What will the rise of artificial intelligence/machine learning mean for the role of actuaries in using "evolving methods to solve complex business problems" (Objective 2, Strategic Plan)?
- How will the actuarial career path change? What will employers expect of actuaries?
- If technology firms enter the insurance realm, how do we help them to understand the value actuaries bring? Do we need to adapt the education we provide to help actuaries adapt to the needs of new employers?

As the Board explores these questions, what it learns will help the SOA to achieve the vision set out in the Strategic Plan: Actuaries are highly sought-after professionals who develop and communicate solutions for complex financial issues. As the use of technology changes in insurance, we need to understand how to position actuaries and actuarial science to ensure its continued success. ■

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Q&A

EVER-EVOLVING REALITIES

Q&A WITH JEAN-MARC FIX, VICE PRESIDENT, R&D

Q: What about your job brings you the most satisfaction? What challenges you?

A: There are two different aspects of my job that keep me engaged and feed two different sides of my personality. On the intellectual side, my job is a constant stream of diverse challenges. For example, on a recent day I had technical discussions with doctors, product development people, underwriters, lawyers and IT specialists. And on top of all of that, I also took our summer interns to lunch. This diverse work keeps you thinking and on your toes. The lunch brings me to the second aspect: I love to help people. Because of my broad experiences, I am often a resource for a variety of issues. I get a lot of personal satisfaction from helping someone get unstuck, and in turn this helps me learn more.

Q: You've been with Optimum Re for 20 years. How have your job and the work you perform every day evolved?

A: I was hired as a product development actuary. At the time, Optimum Re's strategy was to develop products in partnership with our small company clients. Over the years, my role has evolved as I acquired experience in nonactuarial domains like claims and underwriting. What has remained constant is that I am still the point person for anything nontraditional that we want to evaluate.

In a smaller company, with time, your job evolves around your competencies. My employer has always been very encouraging in supporting my volunteer work for the Society of Actuaries (SOA), and, over the years, I have become more involved in a variety of research topics, usually related to mortality or underwriting. The education I gained as a byproduct of volunteering has helped me enrich my own skill set.

Q: What are the most important things you've learned about people, teamwork, work ethics and related topics during your career?

A: I like to think I have learned—and maybe also forgotten—many things. One fundamental thing is communication. It is the necessary element to get anything done. But being a good communicator is an art that must be improved upon constantly, especially for actuaries who may have a tendency to put too much focus on the technical message.

Q: How has your background as an actuary positively affected your work?

A: I became an actuary by serendipity. I was a math major and secretary of the math department at my alma mater, Whittier College. One of the faculty members suggested I look into actuarial science—which he knew about because a math professor from the department had recently changed careers to become an actuary. I owe my whole career and the direction of the next 30 years of my life to that conversation.

In retrospect, although seemingly a technical profession, actuaries in reality are more like liberal arts graduates: They understand and can put into context a broad range of issues that affect insurance companies. Did I mention I went to a liberal arts school? I think a broadly informed and questioning mind is critical to success in any field, and insurance is no different.

Q: What do we know about mortality and longevity now that we didn't know 50 years ago?

A: I have seen the evolution of our understanding of how mortality is not homogeneous. It started with the industry pointing out the mortality impact of smoking, and it evolved with our introduction of preferred underwriting classes as an indirect answer to the AIDS epidemic. Parenthetically, nothing is better than an existential crisis to motivate our industry to move rapidly and decisively. This ability to move fast with the proper motivation may bode well for the future of our industry.

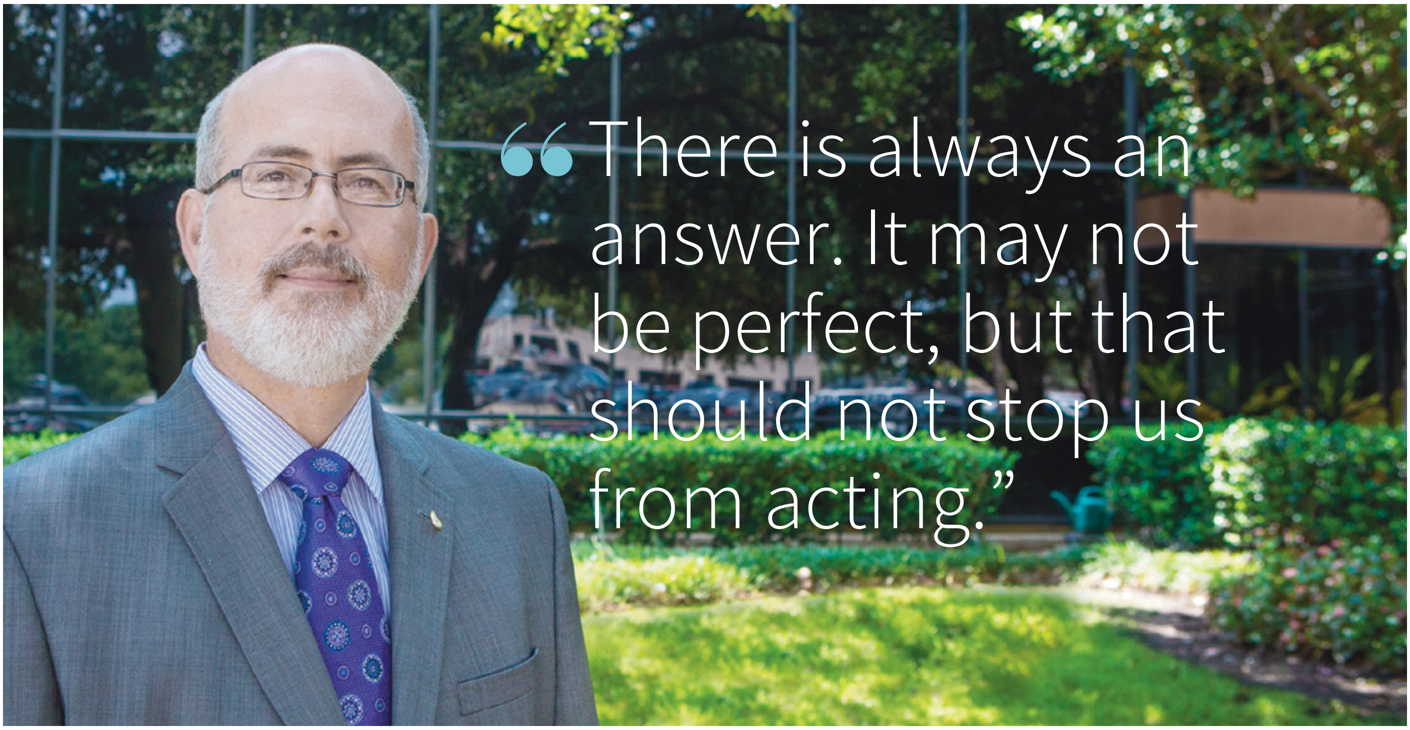
This understanding of the differential continues to evolve today with our attempts at reflecting mortality ever more accurately through the use of predictive models. What still baffles us, though, is long-term mortality improvement.

Q: What can be learned by attending the Living to 100 Symposium? How has it evolved over the years?

A: The Living to 100 Symposium is a unique meeting among the SOA's inventory of meetings. Bob Johansen's vision for the event was a technical meeting to really understand mortality from a scientific perspective. It has evolved to include sessions focusing on the practical consequences. Bob passed away in 2014, but I think he would approve of the direction the symposium has taken. In addition to the sessions themselves and the lively discussions that ensue, the Living to 100 Symposium has world-class speakers in the field of aging research, as well as ample opportunities to mingle with individuals and presenters who are passionate about mortality and aging successfully. I should disclose that I may be biased, as I am currently the chair of the upcoming 2020 Living to 100 Symposium.

Q: How important is teamwork in your department?

A: My department is very small, but I often manage multidepartment teams. Teamwork is one of the key differentiators between a successful company and one that struggles. It is critical for actuaries to interact and build successful communication networks with the non-actuarial areas of a company. This is getting even more



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important as we are confronted with another group of peers who have analytical skills similar to our own: the data scientists. Teamwork is not only important for efficiency, but it also is an educational opportunity for all involved.

Q: What experiences have molded your thinking and the way you work?

A: I grew up in North and West Africa, raised in an expat environment. Although sheltered in actuality, this opened my eyes to the diversity of approaches and range of circumstances in life. Another key factor was bringing this perspective to college life in the United States. I was fortunate to meet many quality teachers, staff and fellow students, and the discussions we had crystalized my thinking regarding the role of a minority in the world.

First, let me clarify that for the vast majority of people, we are a minority in one way or another. I can easily think of five ways in which I was a minority then and am a minority now. It may be from an ethnic, racial, religious, education or life circumstances perspective. In any case, I feel it is the role of any minority in any field of life to attempt to enlighten the majority. By enlighten, I don't mean showing the majority the ignorance of their ways; rather, I mean by sharing another perspective that will allow for more empathy and understanding in their approaches to solving life's problems.

Q: How do you measure success?

A: My measure for true professional success is respect from my peers in the insurance world. In my personal life, I would, of course, add affection to that.

Q: What does a team with diverse skill sets bring to the success of a project and to a company in general?

A: A diverse team does not just bring a more extensive toolset, but also, by approaching the problem from different directions, it allows the generation of more powerful and practical solutions. In addition, in a team that communicates successfully, everyone will be enriched by the experience.

Q: What do you feel is the most challenging aspect of your work?

A: Managing long- and short-term projects concurrently. Research is a task that requires long-term focus and concentration, yet we live in a world of constant, urgent demands—which may or may not be important.

Q: What has been the most important lesson you've learned from your work?

A: There is always an answer. It may not be perfect, but that should not stop us from acting.

Q: What can we expect to learn about mortality and longevity in the future?

A: Mortality is more plastic than we think. We are not moving closer to death at a steady pace. The rate is changing unevenly for different people, but it is even for one person throughout his or her life. We are moving away from a deterministic understanding of our genes and our behavior/environment as the only drivers of our mortality to a fuller appreciation of the subtleties. As we understand better the transcriptome (when and how much genes are activated with age) and the microbiome (the trillions of organisms that live commensally on and within us, especially in the gut), we realize that other factors are significant. It has been shown that spouses of centenarians are long-lived themselves. Why?

We are also finally entering the time where we are studying aging as a multifactorial syndrome. Instead of fighting fires one at a time (cancer, coronary heart disease, hemorrhagic stroke and so on), maybe we can focus on what is throwing the "Molotov cocktails" that are starting the succession of fires that affect us with age.

Q: Did you consider other professions before deciding on becoming an actuary?

A: No. I knew I could not afford to go to graduate school, and I was a math major. Serendipity and a successful internship did the rest. Money may have played a role, as I remember clearly that when the person recruiting me as an intern mentioned the salary, I thought it was for the whole summer. It turned out to be the monthly salary!

Q: What has been the most exciting project you have worked on during your career and why?

A: I have worked on many exciting projects, but two stand out for different reasons. The first was developing Optimum Re's expertise in critical illness insurance. It is a pretty unique opportunity for a product actuary to develop a product from scratch, from understanding the issues to finding the solutions. It forced me to approach product development from all angles, as critical illness insurance is a product that requires close collaboration with all of the areas involved, from underwriting to claims. It was also a chance for me to directly help our client companies—with all of the advantages of consulting without the billable hours. It remains a favorite product of mine, especially for its ability to help even with a small amount of benefits. I think it is ideally suited for the elusive middle market.

The second is being instrumental in our company being the first reinsurer to offer publicly in 2012 reinsurance to a significant portion of HIV-positive applicants in the United States. I think the challenge here was not just the data, but more important, overcoming the mental block on a disease that had threatened to wipe out life insurance in the United States when I started in the insurance industry. I think Optimum Re offering coverage encouraged others to do it as well, and I think it is a positive move for both the industry and for the people who now can get life insurance.

Life insurance is a key financial safety product. It truly can protect widows and orphans from a life of tremendous financial challenges. And isn't that what knights do? Sometimes working on products in front of our computers, we forget the real impact this product can have.

Earlier in my career, my next-door neighbors in my apartment building were an elderly couple. They fought constantly, bitterly and loudly, much to my chagrin as I was trying to study. One day the husband passed away. I, naively, thought the wife would be overjoyed. She was devastated. She happened to have a life insurance policy from the company for which I was working, and she asked me for help during the claim process. That's what showed me the true value of the product we offer.

It is our duty to offer this product to as many as possible in a financially responsible manner. The underwriting and product design functions are key in making that happen, but we always need to challenge what we can do for people, especially if we want our industry to retain its right to underwrite.

Q: What should people know about mortality and longevity that is not widely discussed?

A: The United States is first among nations in many domains. This is not the case for mortality. How can a nation as rich as ours be among the last of the developed world for mortality? It is a complex problem, and I do not think it is getting the attention it deserves. Mortality is the tip of the health care iceberg, and we desperately need to address the issue and not bury our heads in the sand. You can ignore reality, but reality will not ignore you. ■


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Brenda Sawyer at sponsorship@soa.org or 847.273.8822.

GROW YOUR KNOWLEDGE

Looking to be a leader in your workplace or in your profession? Here are some resources that can help you in that quest.

1 EMERGING TOPIC

UNDERSTANDING CLIMATE RISKS

Access new research on climate and environmental sources for actuaries.
ActuariesClimateIndex.org

2 E-COURSE

E-COURSE SERIES ON PRINCIPLE-BASED RESERVES

Access the micro-lessons on principle-based reserves (PBR). This on-demand series from the Society of Actuaries (SOA) covers e-learning on VM-20, stochastic modeling, product development, reinsurance and other related topics.
bit.ly/SOA-PBRSeries

3 WRITING OPP

GET PUBLISHED: WRITE FOR A SECTION NEWSLETTER

Share your knowledge and expertise with SOA members, colleagues and management at your place of business. Volunteer to write an article for a section newsletter. Get started by checking out the volunteer data-base. Scroll through the list of newsletter author opportunities—listed alphabetically by section—and read the requirements.
bit.ly/SOAVolunteer

4 EXAMS

NEW SYLLABI AND READINGS INFORMATION

Take a look at the preliminary syllabi and readings for the 2018 A exams.
bit.ly/SOA-CC-2018

GETTING WITH THE PROGRAM

THE PROFESSIONAL DEVELOPMENT COMMITTEE SUPPORTS CONTINUING EDUCATION

BY TERRY LONG AND KEVIN PLEDGE

The mission of the Society of Actuaries (SOA) is to advance actuarial knowledge and to enhance the ability of actuaries to provide expert advice and relevant solutions for financial, business and societal challenges. A critical part of this mission is continuing education. Each year, thousands of actuaries attend meetings and seminars put on by the SOA, participate in webinars, listen to podcasts and read articles. While the SOA sections largely provide the content for these educational opportunities, the Professional Development Committee (PDC) has a role in assisting with coordination, identifying opportunities and improving quality. In addition, the PDC supports infrastructure with apps, such as the CPD Tracker, and other resources to assist presenters and authors.

PROFESSIONAL DEVELOPMENT COMMITTEE

The PDC is a Board-appointed committee made up of experienced volunteers and SOA staff. It has been active since 2009, and it is charged with ensuring that the SOA's professional development program meets the diverse development needs of the profession and provides the highest quality learning experiences. The PDC ensures that the professional development program is focused on both current and forward-looking technical and nontechnical content, making appropriate use of instructional technologies to assure timeliness of, and broad access to, relevant and engaging programs.

The PDC is made up of 10 voting members: a Board partner, five representatives from the professional interest sections, one representative from the Education Executive Committee, one representative from the International Committee and two SOA staff members. In addition, SOA staff supports the PDC with responsibilities covering education, events, marketing and general insurance.

OVERVIEW OF PDC ACTIVITIES

The PDC supports the development and delivery of professional development offerings, monitors and measures progress, and sets goals to improve the quality and number of offerings. Activities include:

- Review the SOA Strategic Plan to identify any items related to continuing education.
- Assist with the education content of the major meetings.
- Monitor smaller meetings and provide assistance, if needed.
- Monitor webcasts and podcasts.
- Assess, analyze and propose strategies for programs aligned with the SOA's Competency Framework, as well as the overall mission and goals of the SOA.
- Meet with representatives from other professional associations to determine best practices for providing continuing education.
- Align pre-qualification and professional development programs to ensure new methods and techniques are introduced to the professional development curriculum as they are introduced to pre-qualification education.
- Approve partnership opportunities through strategic alliances or third parties.

The PDC meets regularly to accomplish these objectives. Generally, there are nine regularly scheduled conference calls and three face-to-face meetings in the course of a year. In addition, subcommittees are created and meet as necessary.

MEETINGS

A role critical to the PDC mandate is meeting support. PDC representatives are members of the program committees for the SOA Annual Meeting & Exhibit, Life and Annuity Symposium, Health Meeting, Valuation Actuary Symposium, ERM Symposium and Investment Symposium.

The SOA Annual Meeting & Exhibit is the largest SOA-sponsored event and is the biggest actuarial meeting held anywhere in the world. The 2016 SOA Annual Meeting & Exhibit in Las Vegas, which attracted more than 2,400 attendees, offered 167 sessions and two keynote speakers. The sections develop most of the sessions at the meeting, and the remaining sessions typically are developed by SOA staff or companies that sponsor a series of sessions. The special interest section representative from the PDC chairs the Annual Meeting Program Committee. Kevin Pledge has chaired the annual meeting for the last three years and is continuing in that role for the 2017 SOA Annual Meeting & Exhibit in Boston.

The SOA Annual Meeting & Exhibit requires a large amount of work from both SOA staff and volunteers. Selection of location and booking take place several years in advance. Even the volunteer work itself starts quite early. While the meeting takes place in late October, the Annual Meeting Program Committee has its kick-off meeting in January, with the goal of developing a list of sessions by mid-March. During the next several months, speakers are recruited and presentations developed. The result is three days of sessions, events and networking that appeal to actuaries from all disciplines.

Other meetings the SOA puts on are equally world-class; these provide focused education by discipline. Thanks to planning and commitment from the program committees and the presenters, all of these meetings consistently receive excellent reviews and feedback.

MEETING IMPROVEMENTS

Having stability of representation at meetings helps to foster multiyear improvements. Despite the success of the meetings, the PDC continually looks for ways to improve the quality of the sessions. Some of the improvements we initiated at each of the four major SOA meetings include:

- **Limit the number of sessions at which an individual may present.** The PDC has concerns about an individual presenting at multiple sessions during the same meeting. Frequently, an individual who presents at three or more sessions focuses on one or two of the sessions at the expense of the others, and this is reflected in session evaluations. To address this, we have implemented a guideline that an individual should speak at no more than two sessions. Recognizing that exceptions will sometimes need to be made, the program committee chair can approve additional sessions if requested.

- **Expand the number of speakers.** We also frequently receive comments about hearing from the same speakers at each meeting. An additional benefit of limiting the number of sessions at which someone may speak is that more speaking positions are available. The program committees are also encouraging recruiters to seek new speakers.
- **Improve the quality of speaker presentations.** To help both new and established speakers, the PDC has introduced training for speakers and moderators. Efforts have included one-on-one coaching, webcasts and videos from professional speakers. For example, a moderator-training webcast was first provided for the 2016 SOA Annual Meeting & Exhibit. The turnout was higher than expected, and the webcast was extremely well-received.
- **Mentor speakers.** Recognizing that webcasts and videos can only go so far, several experienced speakers have volunteered to mentor newer speakers. Mentored speakers will receive assistance as they prepare their presentations, and the mentors will provide feedback on the delivered presentation. It is intended that the same mentor will assist the mentee for more than one presentation so he or she can apply the feedback and improve.
- **Recognize outstanding sessions.** Finally, everything comes together by recognizing great sessions. Beginning with the 2016 Life and Annuity Symposium, speaker gifts were eliminated and replaced by outstanding session awards. The program chair and the PDC representative select the sessions to be recognized, based in part on evaluations, but also considering other criteria such as attendance. Speakers for the outstanding sessions receive a gift and plaque from the SOA. Additionally, the speakers and the sponsoring sections are recognized in SOA publications.

FUTURE

We expect the meetings to keep growing, both in terms of the number of sessions offered and attendance. In part, this depends on industry developments, but we also are seeing more and more people attend for networking and idea generation. In 2017, we continue to focus on improving the quality of professional development offerings.

- A new Predictive Analytics Symposium was offered in late summer.
- A Certificate Program for Predictive Analytics is being piloted this year. The PDC will review the results and make a recommendation on next steps to the SOA Board in October.
- The outstanding session awards will be expanded to include the ERM Symposium and Investment Symposium.

Volunteer members lead all of these initiatives. The PDC and SOA staff are here to provide support. If you have any ideas as to how meetings or professional development in general can be improved, we welcome your feedback. Please reach out to a member of the PDC or SOA staff. ■

2016–2017 PROFESSIONAL DEVELOPMENT COMMITTEE MEMBERS

Joan Barrett .... **Board Partner**
Kevin Pledge .... **Chair and Special Interest Section**
Pat Kinney .... **Vice Chair and Health Section**
George Eknaian ...... **ERM/Finance Sections**
Terry Long .... **Life Section**
Marcus Robertson ... **Pension Section**
Karen Anway .... **Education Executive**
Bill Sayre .... **International**
Mike Boot .... **SOA Staff**
Martha Sikaras .... **SOA Staff**

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RESEARCH RESOURCES

BY R. DALE HALL

In each of these "Research" columns, I've covered specific topics—from longevity risk and health care to severe weather. In this particular column, I want to take the opportunity to mention several different resources and materials available through the Society of Actuaries (SOA). These resources include tables, calculators, tools and other related resources. These actuarial means are made possible through the efforts of researchers, authors and volunteers, including those on project oversight groups, and employers and firms providing data. Let's take a look at some of these resources.

The SOA's Relative Risk Tool (RR Tool) is a free and easy-to-use resource to assist in determining the appropriate relative risk tables in conjunction with principle-based reserves (PBR). The tool provides a standard relative risk score, which actuaries can use in the process of selecting tables for underwriting classes.

The American Academy of Actuaries' (the Academy's) economic scenario generators are used in regulatory reserves and capital calculations. The Academy and the SOA joined resources to manage these generators. Check them out, along with the accompanying practical guide for how to use them (see Related Links).

Those working with pension plans are aware of the SOA's private pension plan mortality tables, RP-2014. We also update a mortality improvement scale each fall, with the most recent one being MP-2016. The 2017 mortality improvement scale will soon follow it.

Another tool that comes to mind is the Multiemployer Plan Metrics (MPM) Calculator, which is designed to calculate selected metrics for the universe of U.S. multiemployer pension plans. We intend to update this data set periodically. This tool also ties into our past research on multiemployer plan stress metrics.

We also developed an actuarial framework for assessing defined contribution retirement plan benefits. This resource can be used to evaluate the value and effectiveness of a defined contribution arrangement. It provides a uniform system to compare one program with those of other employers in the same industry or geographic area. It also includes a rating system to examine the strengths or weaknesses of the programs being reviewed.

Focusing on retirement risks, the SOA's Committee on Post-Retirement Needs and Risks updated several of its retirement planning briefs. The updated materials include insights on when to retire, dealing with unplanned early retirement, deciding when to claim Social Security and other related subject matter. The committee also developed consumer-focused retirement literacy material with Financial Finesse. The committee will release its next reports in the series of retirement risks research in early 2018. There are also monographs available from the SOA's 2017 Living to 100 Symposium, and these papers focus on implications with longevity and aging.

I also encourage you to check out the wide array of published experience tables from the past two years, which include cancer claim costs, individual disability income, simplified issue and guaranteed issue mortality tables, and the recommendations from the SOA's Committee on Life Insurance Company Expenses for the Generally Recognized Expense Table (GRET). ■

RELATED LINKS

Actuarial Tables, Calculators and Modeling Tools
bit.ly/SOA-Act-Tools

System to Evaluate and Compare DC Plans
bit.ly/DC-Eval

Managing Retirement Decisions
bit.ly/Decide2Retire

Economic Scenario Generators
bit.ly/Scenario-Gen

Retirement Literacy
bit.ly/Retire-Literacy

Living to 100
Livingto100.SOA.org

Find Research by Topic
SOA.org/research/research-topic-list

R. Dale Hall, FSA, CERA, MAAA, is managing director of Research at the Society of Actuaries.

dhall@soa.org

action

GOOD RESEARCH READS

LONGEVITY BULLETIN

The SOA, along with the Canadian Institute of Actuaries (CIA), was a sponsor of the Institute and Faculty of Actuaries' (IFoA) July 2017 Longevity Bulletin, which outlines trends in life expectancy across the United Kingdom, United States and Canada. It also discusses the relationship between health spending and life expectancy, and it provides an overview of the Continuous Mortality Investigation's updated projection model.
www.actuaries.org.uk/LongevityBulletin10

PENSION PLAN CONTRIBUTION INDICES

The SOA study "U.S. Public Pension Plan Contribution Indices, 2006–2014" explores contribution indices and compares pension plan contributions to benchmarks that represent the contribution level needed to pay down unfunded liabilities for contributions among 160 state and large city public sector pension plans in the United States. Using the assets and liabilities reported under Government Accounting Standards Board (GASB) guidelines for financial disclosure, the study spans 2006–2014.
bit.ly/MultiemployerPPAnalysis

RESOURCE COLLECTIONS ON CLIMATE

The SOA and its Climate & Environmental Sustainability Research Committee developed a new repository of information about climate and environmental sustainability research. These climate resources will help the SOA with the development of research projects in the future.

Another SOA report essentially serves as a collection of resources on climate, weather and environmental information. It helps to understand risk management in terms of climate change and examines information from other climate data and publications of interest to actuaries.
bit.ly/ClimateSource
bit.ly/SOA-Environment

Notice of Disciplinary Determination

ON JUNE 26, 2017, the Society of Actuaries (SOA) convened a Discipline Committee to review a matter referred by the Actuarial Board for Counseling and Discipline (ABCD). The Discipline Committee determined that Stacey B. Levine, FSA, should be suspended for a period of five years from the SOA for material violations of Precept 1 of the *Code of Professional Conduct* (*Code*), effective Aug. 8, 2017.

Ms. Levine materially violated Precept 1[i] of the *Code,* specifically Annotation 1–4,[ii] when she intentionally or recklessly submitted or caused to be submitted false, inaccurate and/or deceptive invoices to a client for work which she knew or should have known was not agreed upon, not performed nor covered under the general terms of her agreement with the client. Ms. Levine's company was hired as the actuary and third-party plan administrator for the client's single-employer defined benefit plans. Ms. Levine sent numerous invoices related to the termination of four retirement plans, and ultimately withdrew the majority of the invoices submitted, before aggressively pursuing collection on the remaining invoices. The submission of fraudulent and/or unsupported invoices and the subsequent collection efforts reflected adversely on the actuarial profession.

All members of the SOA are reminded of their responsibility to follow the *Code of Professional Conduct*.

[i] **Precept 1:** An Actuary shall act honestly, with integrity and competence, and in a manner to fulfill the profession's responsibility to the public and to uphold the reputation of the actuarial profession.

[ii] **Precept 1, Annotation 1–4:** An Actuary shall not engage in any professional conduct involving dishonesty, fraud, deceit, or misrepresentation or commit any act that reflects adversely on the actuarial profession.

[TAKE CHARGE]

Continue the cycle of improvement and identify new experiences to pursue. Attend a meeting or seminar. Tune in to a podcast. Take an e-course. These are great ways to take charge of professional development and can help you:

1 | Develop leadership skills.
2 | Stay up-to-date with current business trends.
3 | Expand your network base.
4 | Make meaningful contributions to your company, your team and the profession.

MEETINGS

Influence Training for Actuaries
Oct. 15, Boston
Go far beyond the ability to communicate simply and clearly. Leave with new skills to present more effectively, tell stories that move people to action and design the environment in which you present your work.
bit.ly/SOA-Influence

Advanced Business Analytics
Nov. 28–30, Chicago
Participate in the business analytics revolution. This interactive, hands-on seminar will impart practical working knowledge of statistical and machine learning techniques that are relevant in actuarial work. Core techniques, such as regression analysis, generalized linear models, survival models, time series analysis and decision tree analysis, and “unsupervised learning” techniques, like principal component analysis and clustering, will be covered.
bit.ly/SOA-ABA

E-COURSE

Financial Modeling
Build on the knowledge gained in the Models for Financial Economics (MFE) course in both theoretical and practical ways. See financial models in use, such as the modeling aspects of an annuity product. Explore the model and interpret the results.
bit.ly/SOA-FM

PODCAST

Recent IRS Rulings Highlight Investor Control Issues for Fund of Funds Arrangements
Within the past decade, many requests, and the rulings issued in response, dealt with the concern that indirect investment in publicly available funds could fall on the wrong side of the doctrine. Three recent private-letter rulings, the subject of this podcast, represent a continuation of this trend.
bit.ly/SOATaxationPodcasts

Visit **SOA.org/calendar** for the full complement of professional development opportunities.

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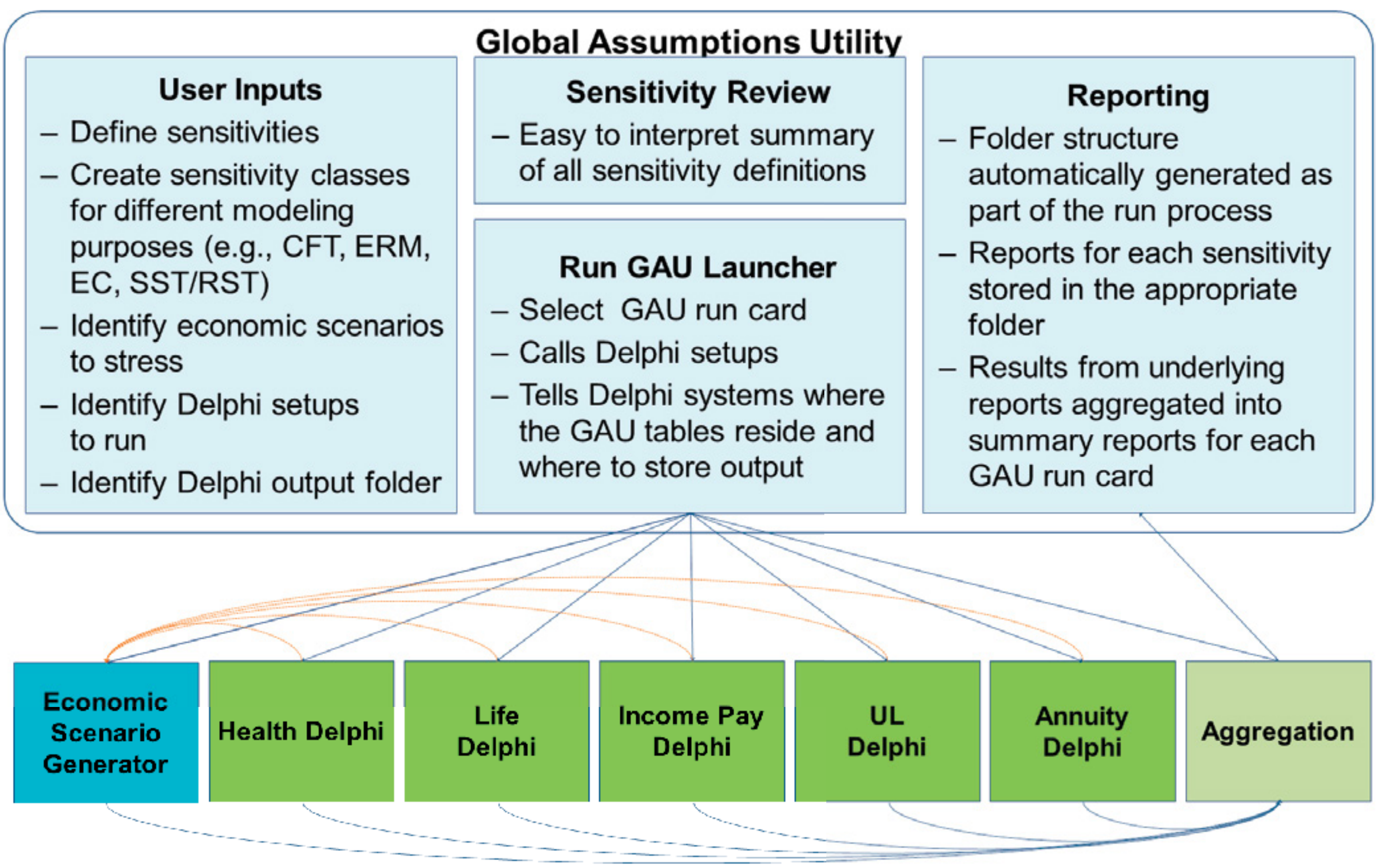

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