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VOLUME 16 ISSUE 1

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mashup

Bucking
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Increasing Your Career Opportunities Through Communications

As an actuary, your technical ability is widely accepted, in large part because of the rigor of the exam process you have successfully completed. However, opportunities for career advancement, especially to management positions, will require you to also have the reputation of being a strong communicator. While we know that data analysis is an actuarial strength, communicating those findings to nonactuarial audiences, in a way that is understandable and will cause them to listen and engage, is perhaps an even more important skill.

How others view actuaries doesn't always fit with reality. While many see actuaries as data experts who are introverted and unable to communicate their findings in layperson's terms, that perception can be changed over time. Actuaries can become known as savvy communicators who are revered for their ability to simplify the complicated and help decision makers draw the correct conclusions from the data.

For those of you who do not know me, I am a frequent presenter at actuarial and other national industry meetings. However, when I first began my actuarial career, I was a poster child for the introverted actuary stereotype. Fortunately



PHOTO: HYON SMITH

JAMES M. GLICKMAN, FSA, MAAA, CLU, is president of the Society of Actuaries. He can be reached at jglickman@soa.org.

for me, just a few years into my career, I reported to the vice president of marketing, who required me to present to the company's field force in a series of one-hour presentations shortly after new products became available to sell. It was an extremely intimidating experience, one that didn't become comfortable for me until many years after that initial presentation, despite the fact I was presenting on areas of my actuarial expertise while receiving lots of positive feedback from the audience. I doubt the opportunity I received to move into senior management, and eventually become an insurance company president, would have happened if not for being forced to develop communication skills some 40 years ago.

I recognize that developing your communication skills is entirely a voluntary activity, unless, of course, you are fortunate enough to have a boss who makes you do it. But for those of you who are willing, here are some ideas to try on for size:

- » Conduct a self-assessment of the Competency Framework.
- » Join a local Toastmasters International club.
- » Participate as a moderator or speaker at meetings.

It is always exciting for me to see our future actuaries build their communication skill sets, from mock-interviews to participating in session discussions. In January 2018, I delivered a presentation to more than 700 Canadian actuarial students during the annual Actuarial Students' National Association (ASNA) conference in Ottawa. It was both a way to interact with candidates in-person and to share with them some of my own personal experiences. I encourage you to consider speaking with math students at colleges

or high schools near you about opportunities in the actuarial profession. Not only will you be giving back to the next generation, but I know you will find this personally rewarding and a great opportunity to develop your presentation skills to a welcoming audience. Please contact CandidateConnect@soa.org if you would like assistance finding schools near you that would welcome your participation.

There are several other volunteer opportunities—such as being a session moderator or working on a project oversight group—to help you harness your skills. Also, the Leadership and Development Section's *The Stepping Stone* newsletter recently highlighted communication strategies for leadership, steps to consider before preparing and presenting a speech, and tips on building interpersonal skills. There's a two-part article on how to increase your influencer skills, and I am sure you will find these types of tips helpful for gaining a different perspective and putting your newly found skills to immediate use. Toastmasters International is another resource to develop your abilities and test them out. Practice makes perfect and builds confidence.

I can assure you that spending the time and effort to build your communication skills and obtain the experience necessary to feel more comfortable in both formal and informal settings will pay dividends in opening up future career opportunities you might not achieve otherwise.

So, whether you are a seasoned communicator or someone who has never made a formal group presentation, please look for opportunities to develop those skills, and please reach out if there are additional ways we can help you develop them. I know from my own experience that this may be the most important skill you can develop for your future career advancement. ■

RELATED LINKS

Competency Framework

bit.ly/Competency-Self-Assess

The Stepping Stone, October 2018

bit.ly/Stepping-Stone-1018

SOA Volunteer Database

bit.ly/SOAVolunteer

Toastmasters International

Toastmasters.org

Raising Our Profile

BY JASON HIQUET



We have an opportunity to remind the world that actuarial scientists are not just insurance and risk experts, but also data scientists with a diverse set of analytical and strategic skills that would be valuable in any profession.

ON SEPT. 10, 2018, BLOOMBERG PUBLISHED AN ARTICLE TITLED “THE NEW AMERICAN DREAM JOB IS PRETTY DULL.”

That career, as you can probably guess since you’re reading this magazine, was a career in actuarial science. I was taken aback by the headline, as I find myself doing challenging and interesting work every day, with a diverse group of high-performing and thoughtful individuals. But the more I thought about it, while I would disagree with *Bloomberg’s* characterization of our work, why should the author of that article think any different? If you’ve never worked in the actuarial field, all you have to go on are the stereotypes and reputation of the profession.

This issue of *The Actuary* is focused on the future of the actuarial profession, addressing questions such as:

- » How will actuarial work be performed, and what actually constitutes actuarial work?
- » Who will perform actuarial work, and where will it be performed?
- » How should we educate future actuaries above and beyond standard actuarial curriculum to

prepare them for today’s workforce?

- » How do generational differences impact how actuaries work, and what do young actuaries expect out of their careers and the companies for which they work?
- » What does the future of the actuary look like across the globe?
- » Outside of insurance and consulting, where will actuaries work in the next five to 10 years?

In addition to these questions, I’d like to pose one designed to prevent headlines like the *Bloomberg* one from happening again: How do we collectively raise the profile of the actuarial profession?

I’m not talking about convincing *Bloomberg* that being an actuary is on par with being a movie star. But I believe that, in addition to our standard professional obligations, we have a responsibility to raise awareness of what true actuarial work entails. We must educate the public on the fact that there are tens of thousands of dynamic professionals with unmatched technical, analytical and problem-solving skills who would be a valuable asset to any organization,

whether it’s insurance-related or not.

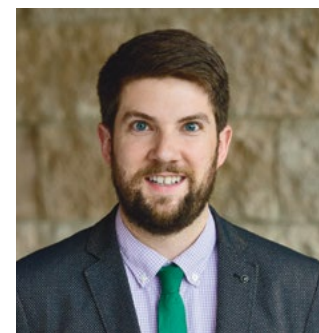
Every time a company comes to a college campus looking to recruit a data scientist without talking to the actuarial department, it’s a blow to the profession. Every time *Forbes* writes an article detailing that the demand for data scientists will soar 28 percent by 2020, without mentioning actuaries at all, it’s a blow to the profession. Every time a company posts a job opening for a data scientist without listing actuarial science as a relevant background/major, it’s a blow to the profession.

Even though the Society of Actuaries (SOA) and Casualty Actuarial Society (CAS) did not move forward with a potential merger, these two organizations still have a unique opportunity (and, I would argue, responsibility) to align and redefine the external-facing messages about who actuaries are and what we can do. We have an opportunity to remind the world that actuarial scientists are often just data scientists who also happen to have deep insurance industry knowledge. But they’re still data scientists!

It’s also essential that we continue to expand the technical, programming

and communications skills that will allow actuaries to continue to be the analytical engine of whatever company for which they work. We have always been a profession with a thirst for knowledge and continuous curiosity, and that trait is more essential than ever.

As the articles in this issue paint in vivid detail, the who, what, where and how of actuarial work is changing, and we must be proactive in expanding opportunities for the profession. By taking the direction of the profession by the reins and raising the profile of actuaries everywhere, the next time *Bloomberg* goes to write about us, they’ll realize the American dream job is anything but dull. ■



ABOUT THE WRITER

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Taxation Section Update: Tracking the New Tax Laws

The primary purpose of the Society of Actuaries (SOA) Taxation Section is to promote and share knowledge of tax laws, regulations and procedures affecting life insurance products (policyholders) and life insurance companies.

At the start of the fourth quarter of 2017, the questions on many minds were: How would principle-based reserves (PBR) affect federal income tax? Would the net premium reserve be entirely deductible from revenue? What about the excess of the deterministic or stochastic reserves?

Near the end of the quarter, the answers came in the form of the Tax Cuts and Jobs Act of 2017 (TCJA). Signed by President Trump on Dec. 22, 2017, this piece of legislation not only addressed some of the tax questions surrounding PBR, but it also changed how both the industry and individuals view the federal taxation of income.

During the 2018 calendar year, the Taxation Section addressed the TCJA through numerous sessions at industry meetings and by way of SOA webinars. The first webinar on TCJA, held in March, drew more than 5,000 attendees and was one of the most attended webinars in SOA history. The feedback from the webinar was positive, and the section quickly followed with another TCJA webinar in May that was more focused on tax reserves. A third webinar, co-sponsored with the SOA Small Company Section, provided information on TCJA and how tax reform affects smaller companies.

In September, the Product Tax Seminar and Boot Camp was held in Washington, D.C. This seminar is held every other year and provides a unique opportunity for company and consulting actuaries to discuss tax issues with representatives employed by the Internal Revenue Service (IRS) and Treasury.

The annual fee to become a Taxation Section member is only \$20. As a member of the Taxation Section, you will receive a copy of the section's newsletter, *Taxing Times*. You will also be able to:

- » Participate in monthly council meetings where we discuss tax changes, regulations and rulings, and plan for future events as a “friend” of the council.
- » Network with SOA staff and industry professionals who work in a variety of business settings. Actuaries, accountants and attorneys play an important role in the section.
- » Author an article for the section's publication, *Taxing Times*, which is published three times a year.



- » Broaden your understanding in a different practice area. How are insurance benefits and annuity proceeds taxed? How has the TCJA affected offshore reinsurance transactions?
- » Take on a leadership role within the section, where you will be given opportunities to attend SOA-sponsored events, network with other section leaders and go to leadership training seminars.

There is no doubt that Congress will enact technical corrections to the TCJA. There will be regulations and rulings that clarify the provisions of TCJA and other issues. Eventually, tax reform will happen again. The Taxation Section will continue to be a source of information and interpretation for insurance professionals. Please consider joining us.

ABOUT THE WRITER

TONY R. LITTERER, FSA, MAAA, FLMI, is an actuary at Fidelity & Guaranty Life Insurance Company. He can be reached at tony.litterer@fglife.com.

The SOA in Mexico City

The International Actuarial Association (IAA) Mortality Working Group (MWG) and Population Issues Working Group (PIWG) held the Local and Global Issues Related to Mortality and Population Seminar on Nov. 27, 2018, in Mexico City. The Society of Actuaries (SOA) sponsored the seminar, which featured several presentations on current market and research topics.

The seminar coordinator R. Dale Hall, FSA, CERA, CFA, MAAA, managing director of research at the SOA and member of the IAA MWG, welcomed attendees. Brian Ridsdale, chair of the IAA MWG, then delivered the opening remarks and highlighted the current work of the MWG and PIWG, noting the importance of researching and discussing mortality and population topics within the actuarial profession.

The opening keynote address was presented by Norma Alicia Rosas Rodriguez, president of the Comisión Nacional de Seguros y Finanzas in Mexico. Her talk, titled “Insurance Markets and Population Trends in Mexico,” highlighted the current state and ongoing development of the local insurance markets. Rosas covered the recent demographic and population trends in Mexico and said she sees opportunities for growth in annuities and health coverages in the Mexican market.

Jorge Campa, CEO, Latin America, for RGA Reinsurance Company in Mexico City, gave a presentation titled “Epidemiological Transition in Mexico and the Impact on the Insurance Industry.” Campa noted that Mexico has shown important changes in the epidemiology of diseases in recent times, combined with environmental, demographic, economic, social and cultural changes, and advances in health care.

Hernan Poblete Miranda, director of Latin America Research for LIMRA’s Secure Retirement Institute, gave a presentation on population, consumer and retirement trends in Latin America. He noted social system dependency ratios for many countries are increasing, with notable growth in recent years in countries such as Mexico, Cuba, Argentina and Ecuador.

Sam Gutterman, FSA, MAAA, CERA, FCA, FCAS, HONFIA, co-vice chair of the IAA PIWG, highlighted the importance of considering the effects of inequality in many actuarial practice areas during his presentation titled “Inequality and Actuarial Science.”

The seminar concluded with a presentation by Allen M. Klein, co-vice chair of the IAA MWG and principal and



PHOTO COURTESY OF EL ECONOMISTA

Norma Alicia Rosas Rodriguez, president of the Comisión Nacional de Seguros y Finanzas in Mexico. Rosas presented the keynote address at the Local and Global Issues Related to Mortality and Population Seminar and spoke about how she sees opportunities for growth in annuities and health coverages in the Mexican market.

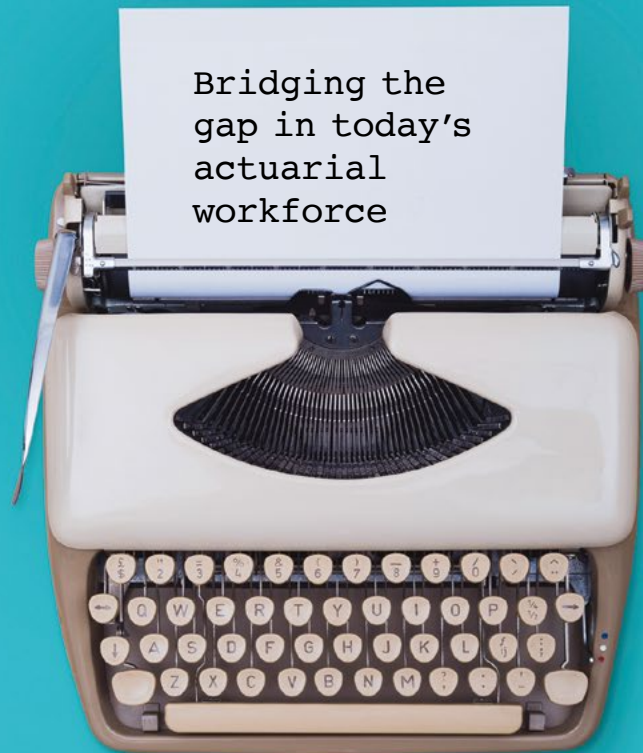
Mexico has shown important changes in the epidemiology of diseases in recent times, combined with environmental, demographic, economic, social and cultural changes, and advances in health care.

consulting actuary at Milliman. Klein’s presentation on the drivers of future mortality highlighted results from an upcoming research release from the IAA MWG with details across a variety of categories including aging, lifestyles, catastrophes, and medical and technological advances.

The Generational Mashup



BY CANDACE WOODS, AMANDA HUG AND JOHNATHON DELLAPENTA





Imagine this: a workplace devoid of the internet, email, iPhones or texting. For some actuaries, it doesn't take much imagining, because we lived it! For others, it is difficult to picture, because it is either a faint memory or a workplace we've never experienced.

Why does this matter? The digital transformation of the past 30 years is symbolic of a shift in workplace culture across generations. Think about it this way—how are you most likely to talk to your coworker? By phone, email or text? How you answer this question may reveal your generation.

Today's workplace is a generational mashup, where coworkers must come together to bridge the gap. First there are the baby boomers, who have deep institutional knowledge and are familiar with "the way we've always done it." Then there are recent college graduates, the millennials, and those who will soon follow, Generation Z, with youthful enthusiasm and the ability to boil ideas down to 280 characters. And, of course, smack dab in the middle of it all are the Gen-Xers. This generational mashup presents a challenge for actuarial leaders, who must consider how to best utilize and develop talent along all aspects of the generational spectrum.

As three actuaries with experience in the industry ranging from three months to eight years to more than three decades, we, the writers of this article, offer our insights and identify challenges for both leaders and new actuaries. We advise on how to not only navigate but also appreciate the ever-evolving landscape of generational attitudes, expectations and desires. We structure our reflections and recommendations around three key stages in every actuary's career trajectory: onboarding, growth and advancement.

Onboarding

Purpose

Now more than ever, individuals are choosing to work for organizations that

reflect their personal values. This trend is even more pronounced among millennials, who seek employment opportunities not only by job description, but also by factoring an organization's mission and purpose into the process. *CNBC* reports that nearly nine out of 10 millennials would consider taking a pay cut to work for a company whose values match their own.¹ It is important that employers are cognizant of this perspective as they look to attract fresh talent.

Helping teams connect their work to an organization's mission and purpose is now required for senior actuarial leaders. This allows team members to feel a stronger sense of inclusion and pride in the organization through their day-to-day tasks. In addition, leaders should make sure their teams and potential hires are aware of their company's investments in their communities and employees. Taking time to create this link can pay dividends in attracting and retaining young talent.

When seeking a job opportunity, actuaries who are new to the field should pursue organizations that align with their values and ideals. Doing so will help ensure long-term job satisfaction and stronger performance.

Hiring Mindfully

With many qualified candidates in the mix, hiring managers have a unique opportunity and critical role in shaping the future of the actuarial profession. New hires will grow into experienced actuaries over the next 30 years. With this in mind, we challenge companies and hiring managers to hire mindfully. What skill sets are most critical and will be most needed down the line? Who will define the profession for the next generation?

Technical competency should be a given—no different than in the past, we need smart, technically capable people to join our ranks. Strong communication skills should also be a prerequisite. New hires need to be able to adeptly explain

their work—in person, via email and in presentations. But we will also need actuaries who can bring unique and outside-the-box expertise, perspectives and experiences to the table.

Each of us had a unique journey to the actuarial profession. For Candace, who grew up in a rural area of Pennsylvania where there were no actuaries, it was an unexpected discussion with her high school trigonometry teacher that introduced her to an opportunity she would have never otherwise explored. For Amanda, the actuarial profession offered a strong foundation from which to pursue broader business leadership. While for Johnathon, being an actuary provides stability after years of service in the U.S. Marines. Between our two companies, Prudential and MassMutual, our list of hires includes those who have studied piano, teaching and even wildlife ecology. Our ranks include a Ph.D. in physics and an MBA from Wharton. And yes, of course, many who studied actuarial science.

Each diverse hire adds something new and valuable to the profession. To increase diversity, companies, including ours, are utilizing early outreach programs as well as partnering with organizations such as the International Association for Black Actuaries (IABA) and the Organization for Latino Actuaries (OLA) for recruitment. Veterans—who can offer a wide array of leadership skills, strong work ethic and a team-focused approach—are another talent-rich pool that historically has been overlooked.

Senior leaders must ensure their recruiters and hiring managers consider a diverse candidate slate, including those with non-traditional backgrounds that will provide teams with a greater diversity of thought. For actuaries in the process of applying to jobs, possessing strong technical skills is no longer enough. One must take on opportunities that will develop other business skills and, if possible, deepen subject-matter expertise in a unique area.

Growth

Career Ownership

Topics on career growth point to one guiding principle: Actuaries, regardless of generation, must take ownership of their own careers. This was true 30 years ago and remains true today. We can (and should) ask our company, managers and mentors to help us develop and progress, but ultimately it is up to us to pursue the right projects, positions and leadership roles to achieve our career goals.

As such, senior leaders should urge and provide avenues for self-improvement and talent mobility. Those entering the actuarial field must understand that there is an expectation for the new generation of actuaries to be well-versed in skills beyond technical expertise. With this in mind, seeking out projects that demonstrate leadership and other relevant skills can tremendously boost a career profile.

For Johnathon, pivoting professions from a military Arabic linguist to an actuary involved returning to school. In Amanda's case, career ownership has meant pursuing an MBA at the University of Chicago Booth School of Business, with the understanding that a business degree will serve as a strong complement to years of actuarial experience. For Candace, she applied for the role of chief actuary of international businesses at Prudential, even though she had no prior experience in that business segment. The experiences gained in that position ultimately helped prepare her to become her company's chief actuary. The takeaway is this: Manage your career to your personalized career goals—there is no one-size-fits-all approach.

Feedback

In a world of one-click ordering, live news alerts and instant validation on social media, we have become accustomed to immediate results. With this in mind, it should be no surprise that millennials, who have grown up in this culture, crave real-time feedback. Oxford Economics



One must take on opportunities that will develop other business skills and, if possible, deepen subject-matter expertise in a unique area.

found millennials want feedback 50 percent more often than other employees.² As such, traditional mid- and end-of-year reviews are becoming less effective.

Managers should instead find real-time coaching moments, such as at the conclusion of a project or immediately after a significant meeting. Actuaries who desire this feedback should take the initiative to request input, and then apply it.

Reverse Mentorship

Traditional mentorship is an important avenue for senior leaders to invest in the next generation and for young professionals to build a network. But now consider *reverse* mentoring, where young professionals mentor senior executives. When you reverse roles, everyone stands to gain. Millennials feel empowered because their voices are being heard, and senior leaders gain insights into a key demographic of their employees and customers. When you find senior leaders who are willing to humble themselves, and younger employees with the courage to speak up, you have a tangible way to extract value out of the generational mashup in which we work.

Actuarial Transformation

The world is moving toward automation, and actuarial work is no exception. Automation does not render actuaries obsolete, but instead allows for more time to be spent on value-added analysis—and less time spent on number-crunching. For some millennials, things may not be moving fast enough, while for some baby boomers, it's uncomfortable to see the systems we know inside and out (e.g., APL, MS Access) going by the wayside. Yet with the rise of data science and technology, all actuaries must be willing to adapt in order to advance the field.

As a leader in today's constantly shifting landscape, being a change agent is imperative. Leaders should strive to set the example in embracing actuarial transformation and provide a North Star for

the rest of the team. In addition to being continuous learners, new actuaries must prioritize cultivating an agile mindset and harness their eagerness for automation to help organizations implement new technology.

New Experiences

Any new professional experience provides an opportunity to learn and broaden one's skill set. Often there's a tendency to think that the only time to change roles is when obtaining a promotion. But this rationale can be self-defeating, unintentionally limiting one's ability to learn and grow. Considering lateral movements—which can provide a chance to learn about new business lines, products and markets—may further propel one's career. Depending on career stage, frequently exploring new roles enhances adaptability and ideation.

Managers can ensure their team members have the chance to regularly acquire new knowledge by promoting talent mobility or rotational programs both within the actuarial function and in collaboration with other departments and businesses.

Actuaries trying to work their way up the ladder should prioritize lessons learned over the time spent in roles. It's not how long you've worked in any one job that makes you ready for the next level—it's how much knowledge you've amassed and the skills you've developed along the way. Try using the "one-sentence" test. Can you distill your accomplishments in a role down to one succinct and impressive sentence? If this proves difficult, then it is likely not yet time to step into a new position.

Soft Skills

The actuarial landscape is shifting from a field of technicians toward actuaries who demonstrate a well-rounded approach to the profession, inclusive of leadership, analytical and communications skills. The actuarial community has long stressed the



Considering lateral movements—which can provide a chance to learn about new business lines, products and markets—may further propel one's career.

Figure 1 10 Principles for Confronting the Generational Mashup

	Principle	Senior Leaders	New Actuaries
Onboarding	Purpose	<p>Help teams connect their work to an organization’s mission and purpose.</p> <p>Invest in compelling human resource programs, benefits and community giving to attract emerging talent.</p>	<p>Seek out organizations that align with your values and ideals.</p> <p>Champion programs and benefits that would attract your peers as employees and customers.</p>
	Hiring mindfully	<p>Recognize the power you have to shape the future of the actuarial profession.</p> <p>Pursue candidates with strong communication skills.</p> <p>Pursue a diverse set of hires, including those with nontraditional backgrounds.</p>	<p>Develop foundational technical expertise alongside strong communication skills and broad experiences.</p>
Growth	Career ownership	Support employees in their career goals, whether that is on a traditional or nontraditional path.	Own your career—set goals and take relevant steps to achieve them.
	Feedback	Offer frequent real-time feedback.	Solicit feedback and act on it.
	Reverse mentorship	Ask for younger and more junior employees to mentor you.	Opt-in to reverse mentoring relationships and use your voice to make a difference.
	Actuarial transformation	Set an example in embracing new technology.	<p>Assist in the development of new technology.</p> <p>Help long-standing employees make the transition.</p>
	New experiences	Establish rotational or talent mobility programs.	Be receptive to lateral movements and opportunities.
	Soft skills	Promote holistic learning and development, which includes soft skills.	Seize opportunities internally and externally to develop soft skills.
Advancement	Recognition	Quickly reward high-performing employees with more challenging work and opportunity for advancement, including promotion.	<p>Demonstrate the value you add to the organization through outstanding work.</p> <p>Seek out mentors and sponsors.</p>
	Succession planning	Consider a broad pool of candidates outside of the team or department as part of succession planning.	Consider taking risks in new opportunities to drive readiness for advancement.

need for actuaries to build their communication skills, but as collaboration with nontechnical partners has become the norm, it has become even more paramount.

Taking this into account, senior leaders should encourage holistic training for their teams. Furthermore, the hiring process should prioritize well-rounded candidates who, in addition to technical expertise, possess essential soft skills or have shown the desire and ability to develop those skills.

Aspiring leaders should seize opportunities internally and externally, both within and even outside of the actuarial function, to broaden pivotal nontechnical skills. These experiences outside of the actuarial function will help expand their network and hone leadership skills in a different way than their day-to-day jobs. This could involve taking on a leadership role in an actuarial club, as Amanda did, or co-leading a management development program, which Candace did in Prudential's domestic life business for several years.

Advancement

Recognition

Career advancement is arguably one of the most pronounced ways in which generations in the actuarial workforce collide. Millennials want to be rewarded quickly and fairly if they produce high-quality work, and senior leaders must find a way to meet these expectations.

Managers can boost morale and assure their teams that good work will be rewarded by establishing ample recognition opportunities and clear avenues for talent mobility and advancement among high-performing individuals. Leaders should strive to keep their young talent challenged with meaningful assignments and promote them on skills and competencies—not on time accrued. Companies that do not reconsider the path to promotion and adjust their practices will lose their most talented workers to more progressive companies.

Younger actuaries should be commended for their drive and encouraged to seek out opportunities where they can clearly demonstrate value to their organizations. Racking up a record of meaningful contributions will best prepare them for advancement and excelling at the next level. In addition, it is essential for millennials to find mentors who can offer them advice and sponsors who can advocate on their behalf, as these relationships play a key role in moving up in an organization.

Succession Planning

As younger actuaries move around more frequently, individuals with a lengthy tenure in a role will become less

common. Therefore, when succession planning, senior leaders should consider high-potential employees who possess the necessary skills but may not reside in that business unit or team. In our organizations, we've seen the general counsel be tapped to lead the information technology (IT) organization and a finance professional be called upon to lead the pension risk transfer business. It's great progress to see forward-thinking talent mobility happening at the top, and we can expect this trend to take root in corporate actuarial organizations as well.

When succession planning, the bench should be expanded to include actuaries with unconventional career paths. Senior leaders can aid in this shift by investing time in grooming and equipping potential successors with foundational skills and knowledge. Similarly, actuaries on the rise should be willing to advance by exploring new arenas and bringing to bear their strengths.

Conclusion

Confronting the generational mashup at our companies is not easy, but it is extremely important. Addressing the shift in expectations and attitudes across generations is imperative to our success as companies and as actuaries. Regardless of your generation, each of us has a role to play in bridging the gap, and we are hopeful that this discussion will provide insights and principles (see Figure 1) to help us achieve this goal. We welcome your feedback—please feel free to call, text or tweet. ■

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Bucking Tradition

A roundtable interview with three actuaries who have gone down unexpected career paths

INTERVIEW BY JASON HIQUET



In this issue of *The Actuary*, you have a chance to read about changes to the nature of the actuarial workforce, the state of actuaries around the globe, changes to how actuaries learn and work across generations, and much more. Continuing along those themes, actuaries have an increased opportunity to expand into nontraditional roles. I sat down with three actuaries with diverse backgrounds, all of whom have taken the leap into a nontraditional actuarial role, to find out what drew them to these roles and what skills you may want to have if you're considering making a similar leap. The panel includes:

- » **Laura Bennett.** Founder and former CEO of Embrace Pet Insurance for 14 years, Bennett currently consults on InsurTech, international pet insurance industries, company culture and growth. She has a driving passion for niche insurance markets and was named an Actuarial Pioneer by the Society of Actuaries (SOA) for her groundbreaking work on pet insurance. In addition to being an FSA, Bennett has an MBA from the University of Pennsylvania's Wharton School of Business, where she graduated a Palmer and Siebel Scholar.
- » **John Dewan.** Dewan, an FSA, left his career at Aon Insurance in the 1980s to become a "sports actuary." At his first company, STATS Inc., Dewan pioneered sports analytics with the most timely and comprehensive sports database, including the first ever real-time box scores in all four major sports. In 2000, STATS Inc. was sold to Rupert Murdoch and Fox News. Dewan subsequently started another company, Sports Info Solutions (SIS), where he currently serves as CEO and continues to specialize in analytical services to 25 of the 30 teams in Major League Baseball (MLB). SIS recently expanded into football. Dewan is also the author of four editions of *The Fielding Bible*, which has revolutionized defensive baseball analytics and resulted in defensive changes on the field such as "the shift" and evaluation of players with new information such as "defensive runs saved."
- » **Taylor Maas.** Maas, an ASA and MAAA, is an actuarial manager for Best Buy/Geek Squad. He currently manages the ratemaking and reserving around their service contract business, Geek Squad Protection. He previously worked in the health insurance industry before making his career change in 2015. He is also a contributor to the RecPoker Podcast.

Hiquet: What originally sparked your interest in becoming an actuary?

Bennett: I accidentally got a summer job with an insurance company. I didn't know anything about actuarial science, and I applied really late for the job. There were two jobs you could get at that time: One was the Canadian equivalent of the NSA, and the other one was to work at Canada Life.

Maas: I attended the University of Minnesota, where I got pushed toward the actuarial science path. I took a course the first semester of my freshman year that focused on aligning your interests with various career paths. I originally thought I wanted to be a civil engineer. We took a placement test in the class and actuary was the No. 1 answer for me. I skipped right over that, since I didn't know what it was. Then I talked to some friends, family members and someone in the actuarial

field. After I learned more about the actuarial career, I decided to pursue it.

Dewan: I began my actuarial career working for an insurance company (Aon), and I loved my job when I was in the insurance industry. Once I passed all of my actuarial exams, I was able to turn my attention to what wound up being my future career, which was the computerization and analysis of baseball data.

Hiquet: What is a typical workday/workweek like in your role, and how long have you been in your current role?

Maas: I've been with Best Buy for about three years. To take a broad lens of what the work year looks like, I prepare for and present quarterly business reviews, and then I calculate rate changes for the business every six months. On a daily basis, there are many days where I go in thinking I'll be working on X, but I end up working on Y. The hot topic or priority can change on a daily basis, and certain times of the year are busier than others.

The actuarial team at Best Buy/Geek Squad began 10 years ago with three or four people, then shrunk down to about one or two people, and now we've started expanding again—we're up to five people on the team. Although we're a small actuarial team, we have reach up to the CFO and get requests from a number of departments. The returns team will ask for help with analysis. The finance team will ask for projections. Controllership will need help with booking revenue for warranty, gift card, tech support or anything that varies with usage rates where they need to match revenue with expenses. Across the organization, we are able to use our actuarial expertise to help other teams do their jobs better.

Dewan: My typical workday is applying analytics to baseball, and we try and find new ways to improve on-field and front-office decision-making. The shining



Across the organization, we are able to use our actuarial expertise to help other teams do their jobs better.

—Taylor Maas, ASA, MAAA, actuarial manager, Best Buy/Geek Squad

example from my career is the use of the shift. It has grown exponentially in the last eight years since I started doing the analytics. If a player pulls 80 percent of his grounders left of second base, then you should play 75 percent of your players on that side of the infield. Now, our analysis is much more sophisticated based on the player, pitch situation and so on. But it's been really exciting for me, almost a crowning achievement, to see this major change in the way defenses play baseball. I'm proud to help them develop the supporting analytics to get changes approved by the front office.

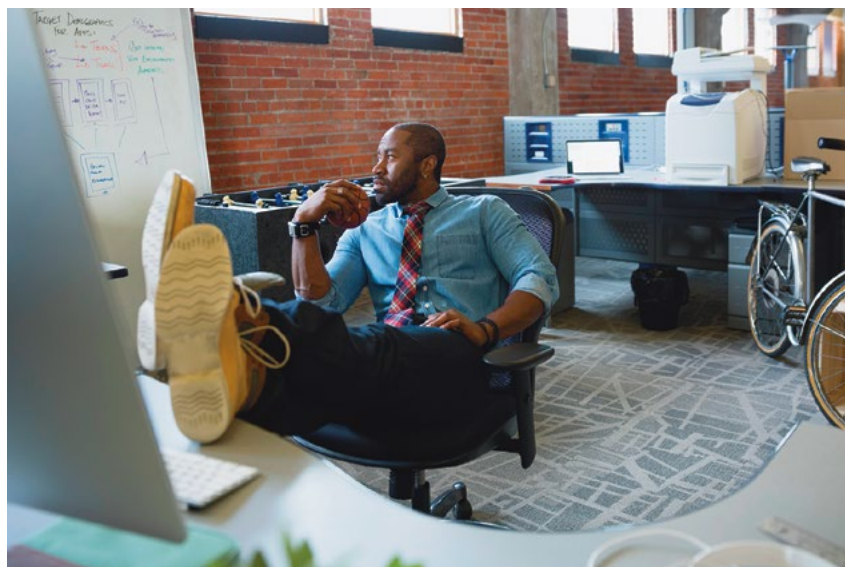
Moneyball was a huge moment. Front-office executives were all scholars of the game, they knew how to play the game, but they didn't want to see the numbers. After *Moneyball* came out, teams went to the other extreme. More than 100 scouts lost their jobs, as teams said, "We're just going to use the numbers." Teams are now understanding that it's a bit of both. It's using the analytics to inform the decision makers—applying our actuarial expertise to data is what we're trained to do.

Bennett: There's a split between getting work, doing work and networking. One day I might be making calls and reaching out to different people to talk about what I can do for them in a traditional networking style. I also help high-growth companies, such as businesses started by Wharton graduates who I already know. Those encounters tend to result in more equity as opposed to getting paid. I also do international pet insurance consulting.

One thing that really affects what I do each day is that people view insurance very differently in different parts of the world. Marketing in Germany involves presenting enormous amounts of data, whereas in France it is all about feel. There are many similarities in product within a country. When I founded Embrace Pet Insurance, I designed and priced the products. I got data from veterinary hospitals, and I hired an analyst

I'm proud to help them develop the supporting analytics to get changes approved by the front office.

—John Dewan, FSA, CEO, Sports Info Solutions

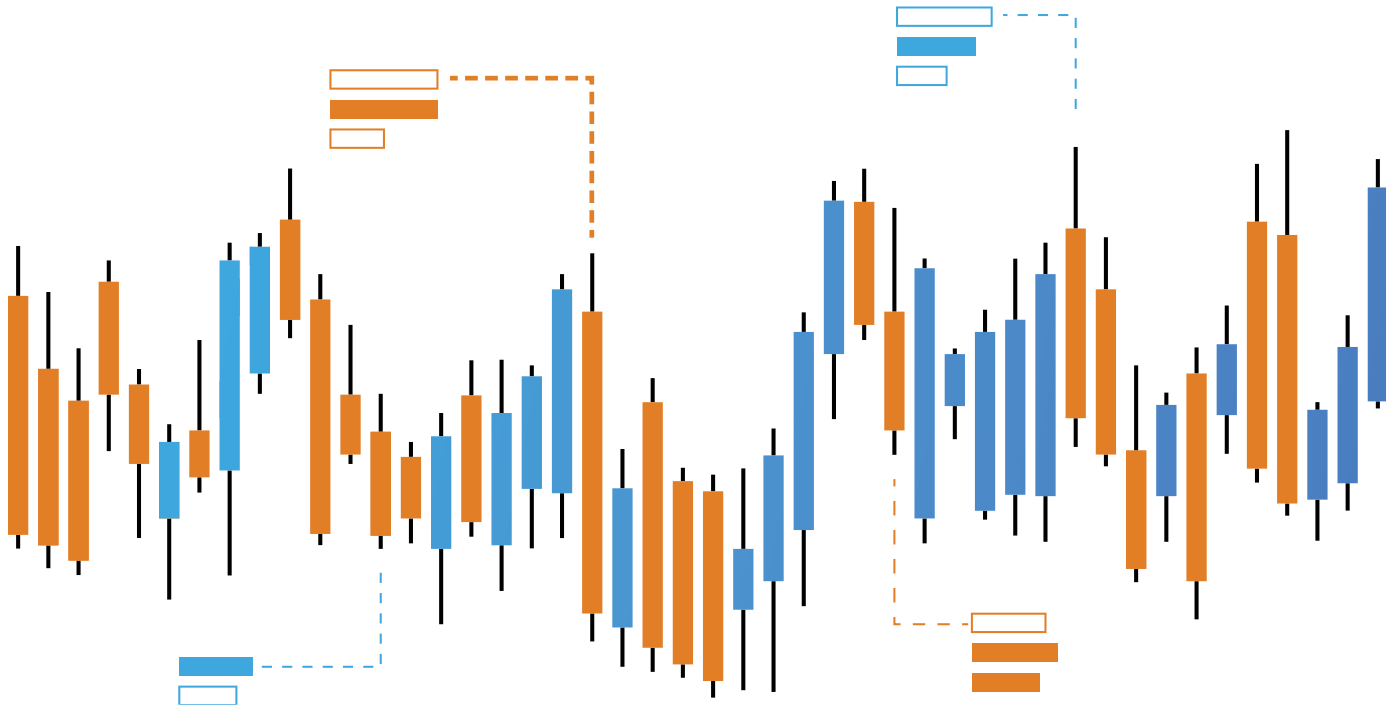


who used to work at Progressive. We partnered with an insurance company, but since it was such an unusual product, they didn't catch on to everything. Eventually, I wound up being a high-level adviser.

Hiquet: What skills do you think are most important to succeed in a nontraditional role?

Maas: First and foremost, communication. In my prior role, I was working almost primarily with other actuaries, so I could communicate actuarial judgment more easily and use some actuarial jargon. In a nontraditional role, I have to bridge the gap between the actuarial work for an audience that doesn't always understand it.

Second, curiosity is huge, from the perspective of "I want to understand this project better" or "I want to understand this data better." We go through problems and approach them in a different way than other departments would.



There's nothing better than creating something and seeing it take on a life of its own.

—Laura Bennett, FSA, consultant

Hiquet: What has been the biggest surprise or challenge about your line of work?

Bennett: For Embrace, everybody talks about how hard it is to start your own company. But you can't really know how hard it is until you do it. I have never been so stressed in my life. You might get to the place where you only have two weeks of money left and you're faced with deciding if you're going to raise money or not. But the highs are so high, there's nothing like it. I'd love to do another startup. There's nothing better than creating something and seeing it take on a life of its own.

Maas: The biggest surprise has been the various ways I can have an impact on different teams. I thought I'd have my core role and then mix in some one-off responsibilities. But my role has grown, including reporting metrics and tools around claims. We take the skills and tools developed for our team and use them to impact other departments.

As far as challenges, it can be difficult to have a math-heavy role while working with people who don't have as much of a background in math. In many cases, it's not

even high-level math that needs to be communicated. It could be as simple as explaining the relationship between warranty usage rates and how that can differ over a two-year warranty product (e.g., 30 percent year one, 70 percent year two) and how that can affect revenue and expenses.

Hiquet: What advice would you give to someone who is considering breaking out of the traditional insurance/consulting career track?

Dewan: I get emails a lot from young people trying to break into the baseball industry, and I tend to give the following advice, a lot of which applies across any nontraditional role:

- » Learn computer programming. Don't just be able to use Excel and Access, but be able to use and manipulate data using SQL or R. To do that, you need to go beyond the Microsoft Office Suite.
- » At baseball's winter meetings, they have a job seekers program and tons of interns are hired at that time. Go there to see the lay of the land.

- » Stay on top of research and trends in the Sabermetrics community. So much of that information is on the internet.
- » Develop your analytical skills by doing your own research. It's nice to want to do it, but until you're actually doing it, you're not doing it. Look at data in your free time. I wanted to look and figure out who the best defensive players were, and there was never anything like that. Create something, then share your results publicly to get your name out there.
- » Develop writing skills to be able to communicate clearly. Being able to write clearly and communicate your thoughts—and not in an overly technical manner—is important. Actuaries and academics can go over-the-top in how they communicate things, such as their machine learning technique or a Poisson distribution.

Maas: Try and understand what the new role will actually entail and make sure the work interests you. It may not be ratemaking, reserving and forecasting, but actuaries have a lot of useful skills that can be presented and utilized in different ways. Also, if it's a role that interests you and you can provide value, don't hesitate too much. If you're interested in a role and a company is interested in you, it will benefit you the same, if not more, than a traditional role. If you make the leap and don't like it, I don't think actuaries will have a tough time getting back into a traditional role.

Bennett: Prepare really well before you do it. You really want to know your purpose. What are you going to do that will add value, and what will people pay you for? If you're starting your own business, have a co-founder—while there's a lot you won't know, hopefully you're working with people who have that knowledge. It is also helpful to have some money saved up and another source of income to support you, but ultimately you just have to dive in.

Hiquet: Laura, what led you to your current career track, and how did you overcome the nerves of branching out on your own?

Bennett: I didn't know I had the entrepreneurial gene. My mother was an entrepreneur of sorts and started a bookstore. I loved being a part of that, but I never thought of myself as an entrepreneur. I went to Wharton to get away from insurance. The culture of a large life insurance company wasn't working for me, and I ultimately wanted to run a company.

While I was at Wharton, a friend's cat got sick, and she spent \$5,000 on her cat and said, "I wish I had pet insurance." She had looked at what was offered in the United States—it was appalling. Three other students and I entered a business case competition, and I realized no actuarial science had been applied in the space and there was a real opportunity.

Hiquet: How have technology changes affected your job or the way you work over the past five years? What impact do you think they'll have over the next five?

Maas: Technology affects me in two ways. First, there are the tools I use in my day-to-day job. Second, technology includes the products we're covering under our service contracts, so we're changing the view of the products we're covering.

In my day-to-day job, we've made improvements due to new and different technologies. Microsoft has a tool called Power BI for data visualization, which has helped immensely with regard to having dynamic reports and a lot of information readily available. There's also progress with predictive analytics. Actuaries are in a very unique spot, and at Best Buy, with ratemaking and reserving, we're always looking at the historical trends, which give us great insight into what can potentially happen in the future. As predictive analytics grows, we're in a great position to run with it.

Dewan: The technology explosion during my career has been incredible. Back in the '80s, we developed software to collect information at the pitch level. From there, we added information such as the direction of batted balls. Then we went down to the location, type and velocity of every pitch and better information on the direction of every batted ball.

Now MLB has put millions and millions of dollars into StatCast, which keeps track of things at an even deeper level (route run by the fielder and its efficiency, spin rate of a pitch, etc.). The technology is growing faster than the actuaries and data scientists can keep up. There is a never-ending source of information for our field to analyze. The most successful entities are those that spend the time to find the information that will help them get a leg up.

You can think of a baseball team as a research center. Each team is trying to do its own research, and they want to keep it secret from the other teams. I know some teams have started to dabble in biometric research and fitness tracking. My feeling is that everything is data. If a pitcher

didn't get a good night's sleep, that's data. If you can get that data over time, you can use that to discern patterns and predict events. That's core actuarial work that helps you get a leg up on your opponents—biometrics, blood pressure, pulse and other things that may be more specific to baseball.

Bennett: Technology will continue to have a massive impact. I presented to the Employer Board of the SOA on the future of the actuary and technology, and I said, "All the small little things that we use right now to train actuaries, all of that will be gone." The mindset is going to change. The nuance with pet insurance is there's a huge behavioral component and that's the sort of value a human actuary brings. Technology can take care of the menial stuff.

I do a lot of informational calls with private equity on pet insurance. I can only do one call at a time. I'll start writing everything I know, put it in white papers, and sell it. It takes almost nothing to do something like that and set up an e-commerce site and self-serve. It establishes credibility and allows you to have more nuanced conversations and charge more for them. The structure of companies is going to change. For actuaries, I think it's going to be massively different—I see a future where there will be almost no rules-based work.

Hiquet: We are seeing more and more competition and crossover between actuarial science and data science. What do you think the future of the actuarial profession will look like in five to 10 years?

Maas: The actuarial profession is going to keep blending into other nontraditional areas. In traditional job postings, you see a list of college majors ranging from economics to finance. Now you're seeing more of these traditional listings include actuarial science or actuarial exams among possible prerequisites. Actuaries have a wide range of strengths and are now using them in a wider range of roles, partly because of their backgrounds—actuarial science with a business background, actuarial science with a math background and so on.

Hiquet: How do you think choosing a nontraditional role might have an impact on your future career trajectory and job mobility?

Maas: My career trajectory has expanded. When I first started at Best Buy, the role could have been "come in at 8 a.m., leave at 5 p.m., and this is my life." But I took on

a mindset of "what more can I do, and how can I impact the company?" There are so many expanding roles at Best Buy—there are a lot of data science roles, and there are reporting and analytics roles. If I wanted to stay 100 percent actuarially focused, it would be staying on my team. But I can also see the impact my personal background could have in various departments around the company.

Generally speaking, our team has increased our visibility over the past year. We've been meeting with the CFO, the Geek Squad president and multiple VPs. We are the subject-matter experts on a lot of high-dollar items. Just recently, an emerging project was presented to leadership and the response was, "We'll wait for the actuarial group to come back with their cost estimates." We're becoming more known in the company.

Hiquet: Is there anything else that you'd like to add?

Bennett: I think it's really good that the SOA is highlighting this, as I think this sort of nontraditional work will be the norm. [InsurTech startup] Lemonade has publicly stated that it doesn't want actuaries. I think they're mistaken. I think they're thinking of actuaries in the traditional stereotype, not as dynamic thinkers who can really evaluate the field and what's going on. Lemonade has made some mistakes that could have been avoided. Supplementing their AI with an actuary could be beneficial, but it will take the right sort of actuary.

Maas: I've enjoyed every day of my career change. I'm expanding my knowledge and skills by working with so many departments outside of the core actuarial team.

Dewan: When I got my first actuarial job out of school in 1976, my salary was \$11,000. You know, as an actuary, your salary moves up very nicely. You pass an exam, you get more money; you move up, you get more money. It's a fantastic career for your monetary well-being. In 1987, in trying to build a new career, I made \$11,000 again. There was risk, but it's been very rewarding for me personally to take that risk. Being an insurance actuary was great, but being a sports actuary has been even better. ■

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A Calculated Transformation

The actuarial workforce of the future can provide even more value to employers

BY TONY JOHNSON, SENECA SMITH, KARA ROSS, CATHERINE YANG AND TAYLOR PATTERSON

**U**

ntil recently, the typical actuary worked at an insurance company or consulting firm in traditional pricing, underwriting, reserving/financial reporting, modeling or capital management roles. Analyzing and managing insurance risk was completed by the actuarial department, which relied on tried-and-tested models, systems and methodologies. While actuaries are still expected to perform these core services, who performs the work, how the work is completed, and what additional work actuaries can and should do has started to shift radically.

The key driver of change in the actuarial workforce is the push to do more with less—a need for organizational cost reduction alongside increased strategic insight. Recent measures to reduce expenditures have extended to the actuarial department, as companies are recognizing the availability and ability of nonactuaries to perform much of the same work at a lower cost. Moving some of the more redundant and repetitive work to nonactuarial resources should create capacity for actuaries to produce more insight and foresight for the enterprise.





As companies rethink the actuarial workforce, many have started to focus on:

- » **Realignment of responsibilities.** Insurance companies are reevaluating the work that should be performed by actuaries and how their departments should be structured to optimize the utilization of actuarial skill sets within the organization.
- » **Changes in the nature of employment.** The rise of the gig economy, crowdsourcing and other alternative staffing models are affecting who performs actuarial work.
- » **Advancements in technology.** New technological developments that enable improved information processing, data analysis, anomaly detection and increased opportunities for automation are influencing how traditional actuarial work is performed.

While these company-level changes affect the actuarial workforce, nontraditional opportunities to broaden the actuarial profession as a whole have begun to emerge. As companies seek to integrate more advanced analytics capabilities within their organizations—and as the actuarial skill set becomes more desirable outside of the insurance industry—actuaries have more opportunities to grow their skill sets and expand into nontraditional career paths. The nature of work is changing across most industries, including financial services, and the actuarial profession is not immune to these changes within the insurance sector.

Organizational Cost Reduction: A Key Driver of Change

Internal factors—such as stagnating sales and the pressure to provide more value-added insight while minimizing expenses—as well as external factors—such as the availability of new technologies and changes in regulatory reporting—have forced insurance companies to concentrate on reducing costs. Historically, when companies performed cost-cutting measures, actuaries were exempt because of the complexity and necessity of their work. Now, companies are realizing actuaries traditionally have held responsibilities that other types of specialists within the enterprise may be able to perform at a lower cost—and many insurance companies are taking advantage of this revelation.

Because actuaries are among the highest paid professionals in the financial services industry,¹ they are now under the spotlight when organizations are looking to minimize costs. Insurance companies are assessing if their highest paid practitioners are doing work that requires the sophisticated skill sets of an actuary. As an example,

actuaries should not be performing data wrangling, but rather they should be analyzing the data to provide strategic recommendations and better inform business decisions. In this example, the data wrangling could be performed by someone in a lower-cost position outside of the actuarial department. Technological advancements have made it easier than ever to access and share files across databases and on servers. This enables the actuarial department to seamlessly partner with other areas of a company.

As other positions subsume actuarial work, actuaries will have more time to focus on work that is aligned to their core capabilities—critical analysis and value-added insight. Released actuarial capacity would allow actuaries to expand their analysis into drivers of profit and loss, improve internal reporting metrics and capture detailed insight into asset allocation—all resulting in more informed decision-making.

Extensions of the Changing Actuarial Workforce

Realignment of Roles and Responsibilities

As a direct result of these cost-cutting efforts, paired with the rapid speed of change and the pressure to be lean and efficient, it has become necessary for companies to reevaluate their normal day-to-day operations and the structure of their workforce. One effort that is attracting attention is the realignment of actuarial roles and responsibilities. This realignment takes two common forms:

- 1 | An evaluation of whether actuaries are doing work that requires true actuarial expertise and assessing whether the work they perform is in line with the responsibilities intended for their assigned roles.
- 2 | An evaluation of the organizational design of the actuarial department, with the potential to move from the traditional “product silos” to “centers of excellence” that span multiple lines of business.

Ensuring the correct alignment of actuarial roles with responsibilities is important for helping actuaries operate as efficiently as possible and adjust to new and ever-changing work environments. As companies go through this transition, the shift of nonactuarial work—whether to different actuarial roles or to nonactuarial roles within the enterprise—typically has proven to be a productive endeavor.

An effective alignment of actuarial roles with responsibilities can lead to increased productivity and allows for actuaries to focus on true actuarial work. Nonactuarial work—such as data retrieval and manipulation, historical product research, serving as a “shadow IT department,”

and fielding claims or operations inquiries—should be performed outside of the actuarial department. Shifting those and similar tasks away from actuaries will help increase their capacity to spend more time on providing insight for the enterprise. As the realignment changes the traditional actuarial workload, actuaries will have time to concentrate on work that requires more judgment and deep actuarial expertise. They will notice their day-to-day focus changing from supervision and oversight—currently amounting to an estimated 48 percent of an actuary’s duties—to more problem solving, which currently accounts for only 29 percent of actuarial time.²

Rise of the Gig Economy, Crowdsourcing and Alternative Staffing Models

Beyond the shift of responsibilities affecting the workplace is the changing

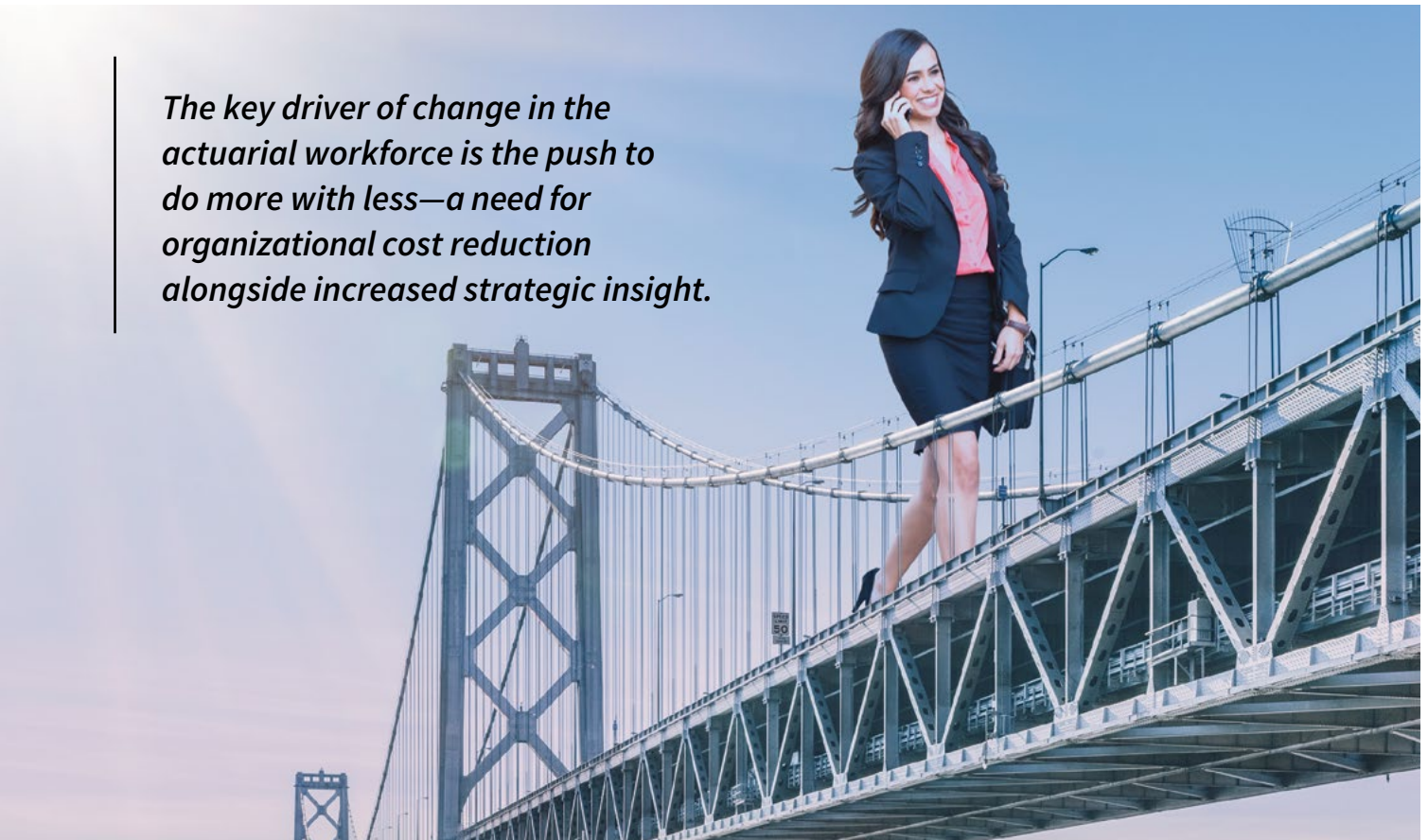
workforce ecosystem. “On-balance sheet” talent is no longer the only form of staff in the workforce. Types of employment are becoming more diverse, with an influx of gig workers and crowdsourced labor. To staff complex financial service roles, companies are more often considering freelancers and contract employees to perform the work. In the United States, for example, more than 40 percent of employees work under alternative staffing arrangements, and this number is steadily rising.³ Along with the types of employment available, staff members desire flexible working hours, the capability to work remotely and the ability to take time off for personal reasons when workloads are low.

Several external factors are at the forefront of this disruption in the workforce. The increased expectations and demand of workers from their employers,



Increased expectations, accompanied by the changing social values of work-life balance, are altering the perspective of workers.

The key driver of change in the actuarial workforce is the push to do more with less—a need for organizational cost reduction alongside increased strategic insight.



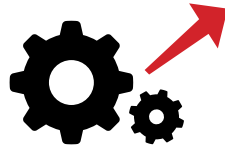
accompanied by the changing social values of work-life balance, are altering the perspective of workers. The opportunity to use telecommunications, remote meeting spaces and other technology-driven mediums provides workers more flexibility. Many employees also are working on teams across time zones, requiring a need to adapt to time as well as space. In addition, businesses are seeking to expand their current capabilities with minimum impact to costs. With the ability to hire nonsalaried personnel, employers can cater their workforce to meet their own business goals and the needs of their employees.

The use of alternative staffing arrangements within the actuarial profession is enticing, specifically with nonrecurring projects and data-driven work. Many firms utilize external platforms to seek crowdsourced solutions. As an example, a competition-based platform can allow for input across various industries and sectors for complex challenges.

Impact of Technology

In addition to reconsidering who is performing the actuarial work, companies are seeking to utilize new technologies to change how the actuarial work is performed. The accessibility and availability of technology is rapidly transforming the way information is processed and work is completed. Along with these changes, the volume and robustness of data is shaping how actuarial and data analysis work is performed. Robotics processing automation (RPA) is systematically advancing the way work is done by applying rules-based actions across platforms to complete repetitive tasks. Natural language generation (NLG) goes beyond that to mimic human judgment by generating tools that utilize both a data set and business rules to generate conclusions. Predictive analytics and cognitive automation augment human intelligence and utilize big data, allowing for stronger analysis on the large influx of data utilized daily.

Due to the surge in the scope and availability of data, employers are demanding an increased level of granularity, greater quantity and quality of analyses, and higher productivity at lower costs. Employees are expected to perform at a faster and cheaper rate with greater accuracy, while focusing their judgment and analysis on high-risk issues. There is a push for employees to utilize technology in areas that require lower cognitive skills and to appropriately allocate their time and resources to areas of higher-level strategic thinking—expanding the



Due to the surge in the scope and availability of data, employers are demanding an increased level of granularity, greater quantity and quality of analyses, and higher productivity at lower costs.

capabilities of the professional to further drive performance improvements. Many companies are in the middle or ahead of this fundamental shift within the workplace. According to Deloitte's *2017 Global Human Capital Trends* report, 31 percent of companies are in the process of implementing robotics processing and automation, while 34 percent are in the process of piloting such processes.⁴

Actuaries are using these revolutionary technologies to strategically improve the roles they perform. Technology enhancements will likely be embedded within each layer of work

actuaries carry out. Any repetitive exercises, such as rate filings, data entry, in-force file processing, formulaic calculations or even collecting data from the web, can be done within a computer-coded software. Automating data preparation is simplified by utilizing data wrangling modules and valuation functions to improve accuracy and efficiency. For data analysis, diagnostics, predictive analytics and cognitive assumption testing, actuaries computerize the procedures within programs—enabling the synthesis of data in a condensed amount of time. Lastly, utilizing NLG, actuaries can report and validate memos and project visualizations of data.

Every actuary needs to ask themselves this question: Do I have the digital fluency, communication, leadership, interpersonal and critical-thinking skills that will be expected of the future actuary once routine processes are automated and removed from my day-to-day work? And companies need to ask themselves: How can we get our actuaries the skills they need to succeed in the workplace of the future, especially actuaries who are decades into their careers? Training may need to come from a combination of company-led and external education to round out the skill sets required.

Competition as an Emerging Driver of Change

As the nature of the workforce changes for actuaries, they can take on positions outside of traditional actuarial roles and look to provide value in other analysis-driven activities. For example, insurance companies are now looking to integrate data science skill sets into their organizations to implement advanced analytics capabilities, such as machine learning and predictive modeling, to help improve key actuarial functions—especially in underwriting, in-force analytics and potentially in reserving.⁵ The growing amount of data available has allowed insurance

companies to find potential in combining multiple data sources to enhance customer and business insights. These trends have introduced more sophisticated tools and techniques to help analyze the data and understand how it can be utilized optimally.

Actuaries traditionally have assumed the role of performing data analysis within an insurance company to manage future risk and uncertainty, as they possess strong quantitative and problem-solving abilities developed from extensive math and statistics training. While actuaries have experience executing robust, standardized and proven problem-solving approaches, there tends to be less training and focus on computer programming, data mining techniques and analyzing unstructured data.⁶ To exploit the data analytics opportunities to the fullest capacity, more advanced skills are necessary, and actuaries can develop these skills to move into more machine learning and predictive modeling work. Some actuarial employers already expect prospective actuaries to possess more advanced programming capabilities and knowledge in statistical modeling.⁷ Due to the rigorous quantitative and technical training they already undergo, actuaries are in a prime position to take advantage of these data-science opportunities as the demand for these abilities continues to rise.

In addition to the expansion of desired technical skills and the movement toward integrating data science capabilities, there is also an increased awareness of the value and applicability of the actuarial skill set outside of traditional insurance roles, especially as technological advancements become more integrated across industries and technical backgrounds are in demand. For example, actuaries have expanded into the technology industry in actuarial roles at companies like Uber, and even in nonactuarial roles such as risk management.^{8,9}

Companies are looking to employ more analytically rigorous and sophisticated techniques to manage risk and uncertainty. The business objective of an actuary's work is to "put a price on risk," and although the insurance industry has been a natural application, this broader mindset of placing a value on risk can be applied across industries. Actuaries can capitalize on this opportunity and move into nontraditional roles in industries such as telecommunications, consumer services, retail and technology. The resulting transformation of the actuarial talent pool and extension of actuarial skill sets can open the door to a greater number of possible career trajectories for the profession.

Change is Here

Change is inevitable and all-encompassing when it comes to the future of the actuarial profession. To stay at the

forefront of these changes, employers may need to modify the training, workload, benefits and roles for actuaries, and actuaries should adapt their skill sets and abilities to the shifting demands of the profession. By changing with the times rather than remaining steadfast in old ways, companies and actuaries can utilize this technological and social evolution to their advantage. ■

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Getting Schooled

Educators from the University of Wisconsin–Madison explore ways to educate the future actuary and push the boundaries of the profession

BY DANIEL BAUER, RICHARD CRABB, GORDON ENDERLE, EDWARD (JED) FREES, PAUL JOHNSON, KIRK PETER, MARJORIE ROSENBERG AND PENG SHI





With the availability of big data and advances in analytics, the actuarial profession is evolving. Simultaneously, colleges and universities are evaluating and implementing changes to their curricula and co-curricular activities to best educate future actuaries. While the Society of Actuaries (SOA), the Casualty Actuarial Society (CAS) and other actuarial organizations provide education for analytic methodologies through the exam process, technology-related skills and soft skills are part of university activities.

Using the University of Wisconsin–Madison (UW–Madison) actuarial science program as a case study, this article considers different aspects of educating the future actuary, implications for the profession, and how colleges and universities can best help students prepare for a rapidly changing job market.

Not all actuarial programs follow the same fundamental curriculum. Actuarial science programs can be housed in different areas of a university, and this can greatly influence the courses offered. For example, the actuarial program at UW–Madison is housed in the School of Business, while many other actuarial science programs are based in mathematics or statistics departments. Also, many successful actuaries graduate from colleges and universities that have no formal actuarial program.

Goals of an Actuarial Program

While each program may be structured differently, actuarial science programs in general can cultivate and disseminate ideas related to strategic risk management, decision-making under uncertainty, business analytics and actuarial science.

The stated goals of the UW–Madison program are:

- 1 | **Recognize** and explain the concept of risk, and apply the knowledge to the development of insurance

products that are used to manage risk for the consumer as well as the risk of those products on the insurance organization.

- 2 | **Be familiar** with the actuarial profession, including the major professional organizations, the professional obligations of being an actuary, and the requirements to obtain and maintain a professional actuarial designation.
- 3 | **Demonstrate** skills in critical thinking, quantitative analysis and communication, as well as develop an appreciation for actuarial theory, research and the link to practical application.
- 4 | **Practice** the soft skills of being a business professional.
- 5 | **Communicate** student experiences and inspire others across the school.

These goals in aggregate help shape the educational core of the future actuary and help students deal with a diverse and ever-evolving landscape of actuarial job opportunities. Achieving these goals can be accomplished through different mechanisms, including directly in the classroom, through actuarial club activities and through other activities outside of the classroom.

Education Inside the Classroom

To successfully educate the future actuary, classes can focus on more than just the core exam material. Successful courses allow students to achieve the higher order of thinking skills of Bloom's taxonomy for educational outcomes, which involves evaluation, synthesis and analysis.^{1,2} Passing actuarial exams is a secondary outcome of classes. The primary goal of learning in the actuarial science courses is to engage students to develop their critical-thinking and problem-solving skills. The combined knowledge of the material itself, along with critical-thinking and

problem-solving skills, allow students to pass actuarial exams. The higher order thinking skills are a critical aspect of educating the future actuary, as actuaries are expected to be strategic and critical thinkers at their companies. Teaching only to the exam material may not provide students with the creative and adaptive real-world abilities that will be most helpful to them over the course of their careers.

To assist with this goal, actuarial science programs can use unique methods to teach course material and expose actuaries to relevant aspects of their future career while still learning core actuarial concepts.

Using Relevant Actuarial Software

At UW–Madison, classes use Excel assignments in interest theory, life contingencies and loss models to help solve problems. Knowing Excel allows the student to “picture” concepts through graphs, such as by changing interest rates or mortality rates to see the impact on the accumulation of funds or the price of a product. Additionally, every class from interest theory to analytics uses the software R to perform some aspect of the coursework. In the interest theory classes, R can be introduced so students can compare results from R to those from Excel. The repetition of using R across classes breeds a familiarity so that when students arrive at a class that really needs to use R, such as regression, they are better prepared and not as overwhelmed. Using multiple software programs to approach the same problem also teaches valuable lessons with regard to real-world model validation techniques.

Learning regression or other machine learning techniques requires hands-on work—integrating the use of programming languages to connect to the course material. Without the hands-on portion, the concepts are often not well understood. For example, the UW–Madison regression class incorporates a hybrid learning environment where there is some lecture and some R work done in class to reinforce the concepts presented. Also, the health analytics class is designed in an interactive way with tutorials that guide students through the material. These interactive classes allow for teaching R in context rather than having a separate course that only teaches how R works. These tutorials and supporting homework assignments enable students to use coding as a tool to get results—rather than be the result itself.

Communicating Technical Material

Both the regression and health analytics classes at UW–Madison stress the communication of the results to help

reinforce learning. The classes are held in a collaborative learning classroom, where six students sit at each table. The group discusses R tutorials, which the instructor then reinforces to ensure comprehension of the material. The additional benefit of this approach is teaching students how to communicate technical material. Being able to explain a concept to one’s technical peer is one thing, but being able to explain and justify the appropriateness of results from a regression model, or why the particular approach taken is appropriate, to a person not knowledgeable in the analytics material demonstrates clear knowledge of the material.

Presentation and Business Writing Skills

Both of these analytics classes also require a project that reflects the course material. The final deliverables for the project include a written report and a presentation to the class. Thus, in addition to defining the problem, collecting data, considering possible solutions and determining the best solution, students need to communicate—both in writing and verbally—their decisions to those who may not be as knowledgeable as they are in the subject matter. These reports represent the essence of the actuarial control cycle.

Research and Industry Trends

Classes can incorporate research and industry experience. The UW–Madison health analytics course is built around research in the health and health policy arena, and the regression class is taught by faculty who do research using these tools and can talk about their research to reinforce concepts. Interest theory and life contingency classes have been taught by faculty who have worked in the life and pension area, while the loss model courses incorporate practice and research in property and casualty (short-term) insurance into the syllabus.

Education Outside of the Classroom

While many aspects of an actuarial science program’s goals can be accomplished through coursework, other activities, such as student-administered activities and employer activities, provide added substance to achieving these goals.

Actuarial Club Involvement

Leaders and members of an actuarial science club can develop organizational and communication skills, both in leading the club and by organizing, planning and hosting club functions. Older students mentor younger students through a student-run mentoring program. Students can learn planning, project management and organizational skills by assisting in the designing and directing of the

Students learn to communicate technical material not just to their peers, but also to people not familiar with analytics. This helps demonstrate clear knowledge of the concepts.



annual actuarial career fair, year-end banquet or other program-sponsored events. They can develop presentation skills by presenting to their high schools to promote the actuarial career. Universities also offer a number of opportunities for future actuaries to develop core business skills.

Opportunities to Teach Other Actuaries

In addition to club activities, future actuaries are given a chance to practice leadership and teaching skills via the Technology and Enhanced Learning (TEL) Project of the UW–Madison program. This work began as a SOA-sponsored project to develop online materials to provide additional help in understanding material associated with SOA/CAS exam P/1. Students teach other students by creating videos that are available worldwide. (See bit.ly/SOA-CAE for more information.)

Exposure to Employers and Real-life Work

Exposure to employers through the actuarial club remains a key aspect of a successful actuarial education for students to learn about different areas of practice and being an actuary. The club sponsors events to allow students to gain exposure to the Student Code of Conduct and Actuarial Standards and their application in the workplace. Internships allow students to learn about the industry, and subsequent club meetings give students the opportunity to present their internship work experiences to their peers. These student presentations help reinforce knowledge of the industry and risk, and help develop communication skills as well as educate others about their experiences.

Education via Case Study

Actuarial programs could create an external board of industry representatives to help coordinate activities for students to expand their knowledge of the profession and the workplace. At UW–Madison, the Co-curricular Learning Board has sponsored case competitions that involve students quickly planning their response to a specified problem and presenting that solution. Other activities supported by this board include the use of marketplace simulations that introduce students to the impact of decisions for a particular company in the face of competition in the industry.

Increasing the Diversity of the Actuarial Talent Pool

Actuarial programs and industry actuaries are integral to making a more diverse and inclusive pool of students aware of the actuarial profession. Examples of this include reaching out to minority and low-income students who are interested in a career in science, technology, engineering and mathematics (STEM) through a presentation at a local college, an informational on-campus lunch and email communications. Younger students are made aware of the role of an actuary, the characteristics and functions of actuaries, and the concrete steps to take to begin an actuarial career. Colleges and universities, along with industry professionals, can help create a more diverse candidate pool for the actuarial profession. Ultimately, the goal is for greater diversity among future actuaries to lead to a more inclusive profession and more creativity and innovation in the assessment and management of financial risk.

Additional Considerations

Educating the future actuary is a constantly changing process. The previously discussed examples inside and outside of the classroom can help develop a diverse,

adaptable, well-prepared generation of actuaries. But there are areas that need to continue to evolve.

Focus on New Technologies

Many companies will place actuaries and data scientists in roles where they will work directly with nascent technologies and tools such as machine learning, artificial intelligence (AI), cognitive automation and blockchain. Actuarial programs can adjust to ensure their graduates have a requisite background in cutting-edge technology.

Encourage Participation in “Additional Skill” Development

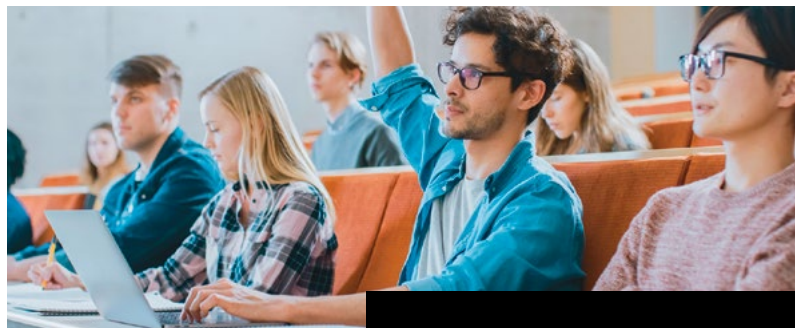
There are a considerable number of activities at UW–Madison where students can learn about the profession, develop leadership skills and improve their communication. However, participation rates of students in activities can be low, as many activities compete for their time.

Students may also get mixed messages—from other students or employers—about the trade-off between passing more SOA/CAS exams and spending more time on learning other subject matter or building other skills. With their “extra” time, students could instead take classes outside of their major or participate more in other activities that develop other aspects of their character rather than focus primarily on passing another actuarial exam.

Be Clear on the Value of “Additional Skills”

Students may pressure professors to structure classes primarily for the purpose of passing SOA/CAS exams. They may ask, “Why in our regression class are we learning R?” Or “Why are we spending time on a project?” Some students may think it is better to spend time in class solely preparing for questions on the new Statistics for Risk Modeling (SRM) exam. While there are no questions on the preliminary exams in which knowing Excel or R would directly benefit students, students would benefit from knowledge of R and from completing a project in class for their future work as an actuary as well as for the new Predictive Analytics (PA) exam or the ASA modules.

Employers can also help when they interact with students. When university faculty connect with employers, the employers are clear that they want to hire students who can think critically and solve problems. They want students who can pass exams, but they are not necessarily looking for students who are close to becoming an associate in an actuarial society. If students see their peers graduating with more passed exams and with multiple majors, they may feel they are at a competitive disadvantage if they do not keep up similarly—even when that is not the case. Students would benefit greatly from hearing



thoughts directly from employers and understand what employers value in a new hire.

Conclusion

In the end, we want to remember that these young adults are college students. Part of the growing-up process is figuring out how to balance their time. We want them to do well in their classes. We want them to participate in actuarial-related activities. But we also want them to explore the world beyond the actuarial realm. It is healthy for students to learn other subjects and spend time with others outside of their actuarial group. It is healthy for students to have fun.

To continue to develop successful generations of future actuaries, universities will continue to explore ways of improving the educational experience of their students. One successful approach to educating students inside and outside of the classroom is to promote their growth as individuals. Schools can:

- 1 | Continue to take advantage of advanced technology to improve student learning.
- 2 | Incorporate several analytics courses in curriculum with a business perspective to consider the challenges and opportunities of big data in the insurance industry.
- 3 | Capitalize on academic–industry partnerships to develop applied learning experiences for students.

If colleges and universities continue to push the boundaries of an actuarial education, future actuaries will be able to push the boundaries of the profession. ■

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CENTERS OF ACTUARIAL EXCELLENCE

The program at the University of Wisconsin–Madison is one example of the well-rounded, comprehensive actuarial education programs offered at all Centers of Actuarial Excellence (CAE) universities. The list of current CAE universities is:

- » Australian National University
- » Brigham Young University
- » Central University of Finance and Economics
- » The Chinese University of Hong Kong
- » Concordia University
- » Drake University
- » Georgia State University
- » Heriot-Watt University
- » Illinois State University
- » Macquarie University
- » Pennsylvania State University
- » Robert Morris University
- » Simon Fraser University
- » St. John's University
- » Temple University
- » Towson University
- » Université Laval
- » University of Connecticut
- » The University of Hong Kong
- » University of Illinois at Urbana-Champaign
- » University of Iowa
- » University of Manitoba
- » University of Melbourne
- » University of Michigan
- » University of Nebraska–Lincoln
- » University of New South Wales
- » Université du Québec à Montréal
- » University of St. Thomas
- » University of Toronto
- » University of Waterloo
- » University of Wisconsin–Madison
- » University of Wisconsin–Milwaukee
- » Western University

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CAE Information
SOA.org/CAE

For more information about the Society of Actuaries (SOA) CAE program, the benefits for the actuarial profession and international development, read “CAE: Looking Back on 10 Years of Excellence” on page 56 of this issue of *The Actuary*.

BREAKING NEW GROUND

The actuary of the future
must emerge with new skills,
knowledge and education to
compete on a global level

BY HUNT BLATZ, STEPHEN J. BOCHANSKI AND COULTER SMITH

“

As we have heard from leaders in many industries, the pace of change will never be slower than it is today,” says Milliman’s Pat Renzi. This insight is as true for actuaries as it is for other business professionals. This article takes a prospective look at where the actuarial profession might be heading over the next five years.

Past and Present

Actuarial veteran Tom Grondin, FSA, CERA, of Canada, recommends, “Start with the past and present, for if we can’t describe and understand the factors that brought the profession to where it is today, then our ability to influence the future is limited or random at best.” So, like the Roman god, Janus, to look forward, one must first look backward—with the caveats this article is not a survey and the opinions in this article do not represent those of the interviewees’ associated companies.

Ambrogio Conte, an innovation and operations manager of an Italian insurer, recounts that in the past 30 years, life insurance shifted from traditional products to investment-linked products, registering a change in the company polarization from the realm of the actuarial team to the kings of investments during the “irrational euphoria age,” and now with a current focus on commercial and marketing units supported by fortified risk management. Conte adds, “Now we are in the digital age and actuaries could become commodities that can possibly be outsourced, exporting the pure actuarial department function.”

Conte’s observation of the marginalization of some traditional actuarial functions is not unique. PwC’s 2018 Actuarial Modernization Survey reports that actuaries at more than half of responding companies spend more than half of their time managing data.¹

Martin Snow, FSA, MAAA, chief delivery officer at Atidot, remarks: “The actuarial profession today is perceived differently than it was 30 years ago. Then,

we were recognized as the profession that understood the entire life insurance business, and actuaries filled executive leadership roles. While some actuaries continue to fill these roles, the profession today is generally viewed as needing to strengthen its soft skills.”

“Company structures are becoming more transversally networked and flat,” adds Conte. “This matrix network plays a discriminant role not only for the largest insurers and technology companies, but even traditional companies are moving to this model.”

The C-suite has become more multidisciplinary, and communication issues emerged as actuarial influence diluted. Uli Stengele, FSA, MAAA, of Nationwide, points out, “There are many more [people] in the actuary’s audience now.”

One driver to these organizational changes stems from the international acquisitions and consolidations among insurers and with some banks, as well as the financial crisis a decade ago. This organizational flattening created opportunities and increased communication challenges for actuaries.

Stengele continues: “Historically, actuaries naturally managed risk. As risk management has become more prominent in the financial services industry, actuaries have often taken on expanded leadership roles, utilizing their skill set to broadly cover risk management responsibilities.”

The Demand for Actuaries

The supply of actuaries appears to be lower than the demand. The Actuarial Association of Europe (AAE) reported in June 2016 that the number of qualified actuaries, on average, per life insurance company is 7.3, and 1.3 actuaries per non-life company.² This may be too low.

Grondin confesses: “I myself have hired many nonactuaries in positions suited for actuaries due to lack of supply. Don’t get me wrong—I was very happy with the hires. It showed me that it is not the

credentials that are important but the skills—namely the ability to solve complex problems. The diversity in thinking also has compounding benefits.”

Other nontraditional actuaries could follow. Under Solvency II, as found in the EU Directive,³ insurance companies are not required to hire traditional actuaries. Roles are described by fit and proper characteristics, and traditional actuarial roles could be filled by economists, data scientists and engineers.



Actuaries are very nimble, leveraging product and risk knowledge to move between measures and risks.

—Uli Stengele, FSA, MAAA, Nationwide

The AAE report states that one in three chief actuaries is not an actuary, and 5 percent of actuarial function holders are not actuaries.⁴ This infusion drops to 1 percent for the appointed actuary role; however, Solvency II does not require insurers to continue having this role.

“Pushed by fragmented regulations and pressure to reduce costs, the networked organizational structure increased integration among actuarial, finance and risk departments,” elaborates Conte. “In the past, there was one siloed actuarial department. Now, no more silos but

many smaller functions [exist] with fragmentation as a new narrative. Blending investments and risk—and creating new unit-linked and hybrid products—the traditional actuarial-specific methods are not so crucial.”

Actuaries can move into nonactuarial roles within an insurance company. “While I have not held a traditional actuarial role in four years, I think that having an actuarial understanding of the financials helps me in my job every day,” says Aegon Asia’s Eriphile Philippides.

Revisiting Risk Management

“Actuaries are very nimble, leveraging product and risk knowledge to move between measures and risks,” observes Stengele, who also believes actuaries are natural risk managers.

The AAE agrees. The AAE report mentioned previously states that the risk and actuarial functions in about four of five member countries can be combined.⁵ The AAE report conclusion also notes: “It is acknowledged by the AAE that the risk management system requires a wide range of expertise. However, the multi-disciplinary education, and especially the modeling capabilities of the actuary, enables the actuary to provide relevant and useful input to many areas of the risk management process.”⁶

The Changing Actuarial Profession

As previously stated, communication challenges arose from organizational changes where part of the challenge appears to be institutionalized. AIG’s Steve Malerich, FSA, MAAA, explains that the actuarial profession changes slowly: “Once we find a solution to a problem, we tend to stop looking for better solutions—the Einstellung effect. If someone finds an alternative after a solution becomes established practice, we wait for everyone else to accept the new solution before we accept it. And with everybody waiting for everybody else, nobody accepts it.”

He continues: “For example, a 1992 article in *The Financial Reporter* established ‘the change in the k-factor times the accumulated value of gross profits’ as the way to measure the effect of assumption changes on the deferred acquisition cost asset of universal life. Though accurate, that formula has no explanatory power. In communications, it puts an esoteric actuarial formula in between cause and effect. Yet, this remains a common practice when ‘explaining’ GAAP income. And with targeted improvements bringing the same dynamics to traditional contract reserve calculations, some are preparing to ‘explain’ results using the same ineffective tool.”

As illustrated in Malerich’s anecdotes, the profession’s reticence to change alludes to an underlying institutional obstacle. Aegon Blue Square Re’s Chris Madsen, ASA, MAAA, explains, “The professional educational system with its ‘natural selection process of exams’ does not necessarily prepare actuaries for the future and does not lend itself well to agile forward thinking.”

Data and the Digital Age

Some parts of the traditional actuarial function are shrinking. “Insurers are trying to find ways to automate most of their mundane tasks and use technology to improve model efficiency/advancement. Running entire processes, or even valuation processes, with a few simple clicks will free up resources, help reduce staffing costs, reduce operational risks and speed up the reporting cycle,” notes Milliman India’s Varun Bhatt.

Nevertheless, some actuaries are now working outside of insurance. The same AAE report states that 40 percent of qualified actuaries are not working in insurance.⁷ By way of an example, actuaries can build credible business models in this digital age.

PwC’s Steve Bochanski, FSA, MAAA, CERA, one of the authors of this article, successfully used an actuarial cash-flow

projection model with transition matrices to simulate digital crowdsourcing membership for an innovative recycling rewards scheme, called WASTED, in the Netherlands. Bochanski concludes, “Applying actuarial techniques in the area of demographic modeling, such as for social services or urban planning, as well as broader strategic business modeling in virtually any domain, is a promising growth channel for the actuarial profession.”⁸

“Today, there are many actuaries in long-held positions, and they believe that resources are not fungible—that’s often not true,” explains Stengele. “While learning curves often are quite steep, good documentation and infrastructure can be very helpful in applying actuarial skill sets to a large and changing number of issues.”

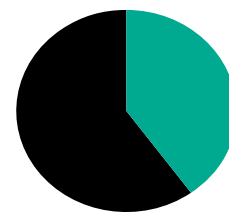
Health IQ’s Ryan Hinchey, FSA, explains, “Data sets that are becoming available are too large for spreadsheets and [contain] other characteristics that are not suitable for traditional actuarial techniques.”

“I expect major changes in how insurance (and external) data will be used,” predicts Marco Groot Wassink, CFO at Legal & General Insurance in the United Kingdom. He warns, “Actuaries will struggle to stay relevant in this part of our work and its commercial application unless we become proper data scientists.”

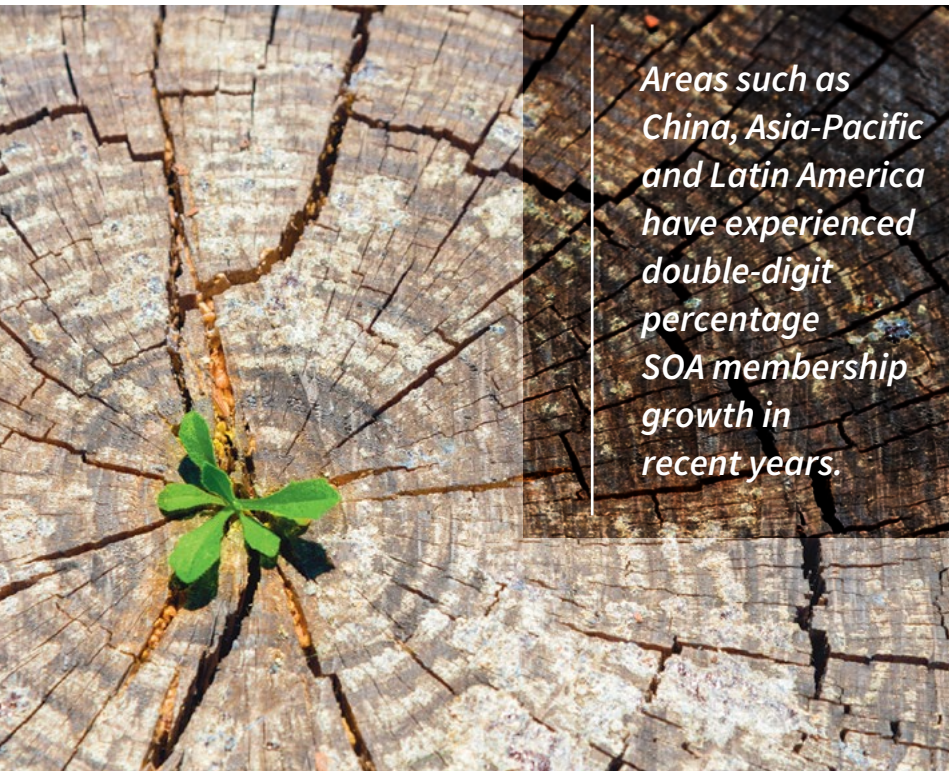
Nevertheless, those traditional actuarial-specific methods remain useful in markets with poor or scarce data. Allan Wong, FSA, of RGA in Hong Kong, reports: “Since moving back to Asia and working on products for Southeast Asia, I’m struck by the need for judgment and the real lack of data for some markets. I think we forget sometimes in the West that there are emerging markets for which old-school first principles assumption development is still the most important thing.”

Relevant Skills, Old and New

“Successful actuary qualities are natural curiosity and inquisitiveness, with a solid understanding of the basics,” notes Stengele.



40 percent
of qualified actuaries
are not working
in insurance.



Areas such as China, Asia-Pacific and Latin America have experienced double-digit percentage SOA membership growth in recent years.

Wong adds that business acumen is also important. “I think adapting to new software, data and machine learning are all part of our future, but the space where actuaries will excel and where we’ve always excelled is where the facts cannot be known with certainty, so someone still needs to make a business decision,” he says.

“Improving actuarial communication and leadership skills need to be two of the profession’s most important priorities,” stresses Snow. “These changes will once again enable greater consideration of actuaries for executive and other leadership roles. After making these changes, we need to get the message out to boards of directors and executive leadership teams.”

For those actuaries who have developed their nonactuarial communication skills, Philipides concludes: “Where actuaries bring value to the organization is by translating their understanding into insights in [layperson] terms that will help executives make informed decisions. I don’t see

why this will change. Sure, big data and artificial intelligence will enable insurers to have more complex models, but in my opinion, our true value lies in analysis and providing meaningful insights.”

Madsen muses: “Actuaries who are stochastic modelers, specializing in specific products or structures, are hard to find and they are great resources. Unfortunately, actuaries tend to deal with traditional analysis that works in a stable environment, and not with statistically significant analysis that works in shifting regimes. With regime shifts, the time horizon for traditional techniques is too slow to react, resulting in losses through anti-selection and, maybe, without enough time to recover.”

Product Innovation and Business Opportunities

Hinchey’s comment of tying behaviors to products appears to be revolutionary. “New products focus on partnering with policyholders to align incentives and help them live longer, healthier lives,” he adds.

In property and casualty insurance, there’s the Progressive insurance company’s “Snapshot” that monitors driving behavior using a GPS device, and some insurers use the driver’s cell phone to monitor acceleration, stopping, braking, fast turns and time-of-day—all of which can be tied to premium discounts. Madsen notes, “Products may change to floating discount based on behavior, which we see in some life insurance products now.”

Vitality in South Africa with Hancock in the United States, and Brazil’s WinSocial, are linking policies to wearable devices where policyholders earn credits for good behaviors. Madsen elaborates that one consequence of this innovation is the reshaping of insurance companies from indemnifying institutions into policyholder personal risk and health managers. In this model, the insurer actively participates in the policyholder’s



The Actuarial Association of Europe reports that 1 in 3 chief actuaries is not an actuary.

GLOBAL SOA MEMBERSHIP HIGHLIGHTS

During the General Session at the Society of Actuaries (SOA) 2018 Annual Meeting & Exhibit in Nashville, Past-president Mike Lombardi congratulated the profession on reaching a membership milestone—more than 30,000 actuaries across the globe. He stated: “This milestone ... serves as a call to action to enhance our contribution as experts. As we grow in numbers, we must also build upon our skills to advance as leaders, in order to capitalize on more opportunities provided by our increased visibility.”¹

Many are familiar with the SOA 2017–2021 Strategic Plan, which guides decision-making and the future state of actuarial work. Several components of the Strategic Plan are specific to actuaries globally or related to broadening the SOA’s reach internationally. Approximately one-third of the actuarial profession’s members and candidates are outside of the United States. Areas such as China, Asia-Pacific and Latin America have experienced double-digit percentage membership growth in recent years.²

Objective 5 of the Strategic Plan relates to providing valued services to global stakeholders, tailored by region. Some recent highlights supporting this objective include:

- » In China, the SOA has partnered with Nankai University for more than 30 years. Students who were in the inaugural classes in 1987 are now senior actuaries in roles spanning the insurance industry, government and academia. The SOA also offers the China Annual Symposium to bring together experts and local organizations for both developmental and networking opportunities.
- » In Asia-Pacific markets, the SOA has regularly held an Asian Actuarial Conference as well as an Asia-Pacific Annual Symposium. Also in this region, the SOA recently joined with LIMRA on a study related to retirement across Greater Asia and China.
- » In Latin America, the SOA is focused on Argentina, Brazil, Chile and Colombia.

Members of the Latin America Committee (LAC) are assessing the needs for these countries by interviewing local actuaries to learn more. The LAC also collaborated with the Casualty Actuarial Society (CAS) on an international program in actuarial science in Colombia.

- » During the October 2018 Board of Directors Meeting, the SOA approved the 2019 Strategic Initiatives. These included continued review of strategies for China and Greater Asia—building off of the progress of the SOA Board-appointed task force that was first created in 2017.

Objective 6 of the Strategic Plan involves supporting actuaries in gaining global perspectives and knowledge. The SOA networks with other international actuarial associations and most recently has focused on how issues such as big data and health care are addressed across the globe. Complementing this, the International Section offers the SOA Ambassador Program to support the identification and development of subjects of international interest, as well as ascertain the potential needs of SOA members in different areas of the world.

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safety and well-being. Madsen extrapolates that organizationally this could potentially lead to a renaissance of the “mutual company” structure, but implemented through new tools.

Solvency II has also changed how insurers view their existing businesses. Under Solvency II, not all business lines continue to make sense. Since the financial crisis and Solvency II, insurers are repairing their balance sheets. In this process, U.S. companies may not appear as attractive, and insurers may look to focus their lines of business. Actuaries are well-positioned to develop an understanding of the different regulations, capital models and accounting regimes, making themselves prime candidates to help insurers shed businesses and determine where those businesses should go.

Does All This Mean More Schooling?

It depends. “The best thing about my role is the blend of skills involved,” says startup Bestow’s Dan Stevens, FSA. “I’m having to draw on a much wider variety of experience gained over the past 22 years. The nontraditional functions capitalize more on the skills I developed on my own rather than those I developed through the formalized actuarial training.”

Where the answer to “Does all this mean more schooling?” is “yes,” some universities have been moving to close this gap. “The University of Minnesota has made incremental changes to its actuarial curriculum since 2011,” explain Breanne Richins, FSA, and Aileen Lyle, MAAA, FCAS, both instructors in the actuarial program at the university. “We are putting actuarial students in front of the class, working collaboratively in small teams, creating intensive report and summary writings, and developing and presenting recommendations.”

Laurie Derechin, executive director of the Minnesota Center for Financial and Actuarial Mathematics (MCFAM), says, “Adding these softer skills to the actuarial curriculum was actually borrowed from one of [University of Minnesota’s] Biomedical Engineering Design courses, where students work in teams on design projects and present completed work at a ‘design show.’”

In MCFAM’s Master of Financial Mathematics (MFM), there is both an interdisciplinary cross-fertilization and an injection of stochastic mathematics and programming skills in the curriculum. Business professionals in the Twin Cities also participate in the MFM. Derechin notes: “Some actuaries working in our large insurance hub have



As we grow in numbers, we must also build upon our skills as leaders to capitalize on more opportunities provided by our increased visibility.

complemented their actuarial skills by doing the MFM part time. Those actuaries with both an FSA and an MFM have taken on roles where they lead hedging strategy development and financial engineering. They are uniquely equipped having studied both sides of the business.”

Final Thoughts

“I think there is a lot more room for growth in actuaries expanding to other professions,” emphasizes Grondin.

“Actuaries, being as unique and few in number as they are, can benefit many teams, companies and industries by adding a little of our own diversification to the mix.”

“I hope actuaries emerge as powerful voices to assess how we manage the significant societal risks that new technologies and innovations may create,” concludes Renzi. “I believe that as technology and data change the way we live and work, the skills of actuaries can be used to really lead the way and provide the necessary cautions and protections.” ■

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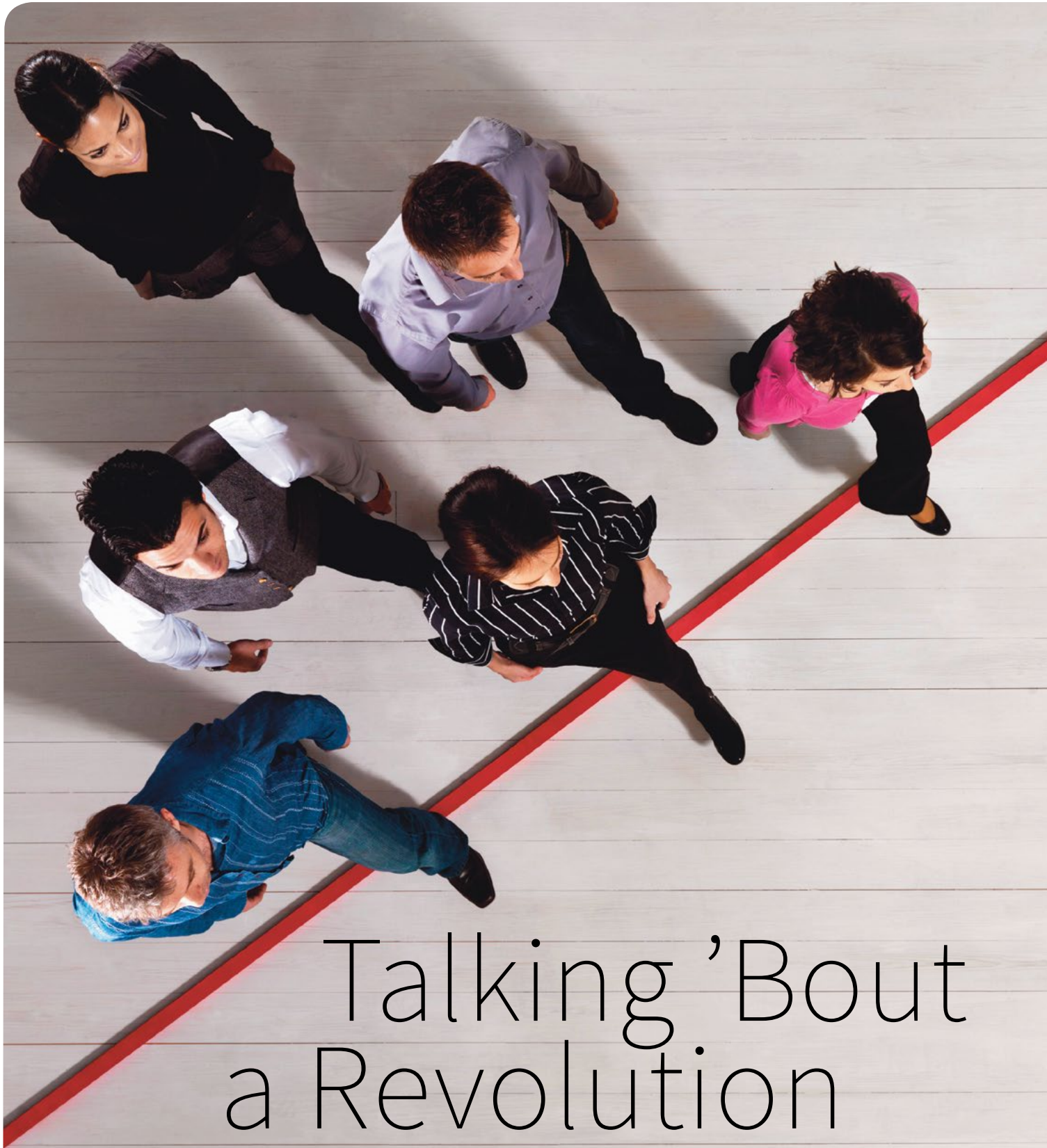
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Talking 'Bout a Revolution

BY JYOTSNA SANKURATRI AND KELLY HENNIGAN

Actuaries and IT teams collaborate for effective change



The insurance industry is experiencing a FinTech/ InsurTech revolution, causing disruptions in the day-to-day operations of the actuarial and finance disciplines. Companies are being challenged to become more digital and data-centric. As a result, organizations are making significant investments in more efficient and modern tools to enable advanced data and analytics capabilities. This rapid evolution in technology and its associated implementation can be extremely complicated and exhausting to keep pace with—requiring actuaries and information technology (IT) teams to work together now more than ever. In an IBM study, more than 1,500 CEOs identified their No. 1 concern as the growing complexity of their environments, and the majority of those CEOs stated that their firms were not equipped to cope with the complexity.¹

Many have heard the horror stories of actuarial transformation efforts that have gone awry due to a company's rudimentary (or complete lack of) data practices. Unfortunately, many organizations are not data-centric. Some companies may not have a data cataloging mechanism or data dictionary—a tool or process that includes detailed information on business data elements such as definitions, usage, allowable values, format and relationships to other data—which is a critical component in enabling effective communication across business and technical teams. PwC's 2018 Actuarial Modernization Survey across more than 50 life and property and casualty companies found that fewer than half of responding firms had a data strategy, data dictionary or robust data management in place.² Actuaries have been forced into a vicious cycle of sourcing data from multiple administrative platforms, discovering information is missing and thus being unable to reconcile the data in a timely fashion. This leads to a general lack of confidence in the results and recommendations produced. Actuarial talent is often consumed with activities like data preparation, quality checks and reconciliation, leaving limited time for analysis. What's more, timely insights are being ignored or rendered unusable due to the aging of or lack of conviction in foundational data.

Some of the most important innovations of coming decades will not be new technologies, but new ways of working together that are made possible by these new technologies.

—Thomas Malone, professor,
MIT Sloan School of Management

Working Together to Navigate Change

With data becoming a prime target for automation, business and technology departments are finding they must come together to evoke long-term behaviors to ensure successful partnering on solutions. As stated by Dustin Verzal in the Society of Actuaries (SOA) Actuary of the Future Section's May 2018 newsletter: "Although data science and actuarial science are technically two different fields, they are not mutually exclusive. Both sides can benefit from collaboration and cross-training in each other's discipline."³

SPEAKING THE SAME LANGUAGE

A solid team dynamic between business and information technology (IT) professionals is not formed overnight. We discovered this at Voya throughout our Actuarial Transformation project, as we built out our data dictionary. As actuaries, we use acronyms like CSV for cash surrender value and MGIR for minimum guaranteed interest rate more often than kids text LOL (laugh out loud) or YOLO (you only live once). We quickly discovered that other professionals, like IT, did not speak the same language.

For instance, if actuaries requested a monthly trending of CSV by product, we expected to receive accurate results. However, we quickly learned that no one had explained to IT what CSV meant to actuaries. In fact, based on their past experiences, IT initially interpreted CSV to mean "comma separated value." Further amplifying the challenge, the field containing this data had different naming conventions depending on the data source. For example, CSV may have been called AV2 in one legacy admin system, CV in a second admin system and FV in our new cross-system solution. Thus, we had to work extensively with IT to develop a robust data dictionary where we were able to connect these dots and start speaking the same language. This foundational exercise was critical to obtaining accurate results and the overall success of our transformation project.

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However, this partnership across data science and actuarial science can be particularly daunting for these professions, as individuals across both fields are very capable of independently managing data-related activities, such as parsing together disparate data sources, transforming data into consistent and usable formats, writing macros and demonstrating a heavy reliance upon the wizardry of Excel.

Change can be difficult and resisted for a variety of reasons and emotions, such as feelings of losing control; unknowns and uncertainties; the memories, skepticism and resentments associated with past change efforts that did not go as planned; and perhaps, most influential, the fact that change oftentimes equates to more work! In a 2013 Katzenbach Center survey of more than 2,200 executives, managers and employees, 65 percent of respondents stated they experienced some form of "change fatigue," a dynamic that occurs when employees feel they are being asked to make too many changes.

People will only be successful in overcoming complexities when they are empowered to navigate through change. With technology vendor selection efforts, project management status updates and implementation deadlines to manage, organizations can quickly lose sight of the fact that underlying the applications, infrastructure and vast amounts of data are people. Mercer's 2018 Global Talent Trends Study stated: "Technology in the workplace will maximize its impact only when paired with human judgment ... technology brings us into the human, connected age of working."⁴

As the technology revolution continues, actuaries should challenge IT colleagues to provide advanced self-service tools and capabilities that simplify their day-to-day work. This will allow them to focus on improved analytical insights and advanced reporting for the business. According to SunGard, 60 percent of insurance organizations noted that improved automation of data feeds and enhanced reporting were key improvement areas in 2018.⁵ By enhancing data and reporting, actuaries will continue to stay relevant, develop skills and deliver value while also challenging their employers on inefficient, status quo processes. However, IT needs to counterbalance these business requests if actuaries place too much focus on disparate solutions that are "best in breed" on a capability-by-capability basis. For example, if an actuarial department is in need of a data visualization tool, emphasis should not be placed on securing a specific tool offered by a particular vendor. Instead, a tool offering the necessary data visualization capabilities that could be leveraged across the broader organization

and optimally weaved into the strategic technology platform should be contemplated. In these situations, the IT department is accountable for providing the oversight and perspective on corporatewide integration of modern solutions to strive for architectural and organizational simplicity.

It is essential for leaders to foster an environment of collaboration, maintaining a symbiotic relationship across actuaries and their IT counterparts. Actuaries are known for their analytical mindsets and “why” mentality—both of which contribute to building a strong partnership with technology departments that may not have the full business perspective. Conversely, IT professionals are known for their broader view of organizational infrastructure, programs, applications, software, project impacts on multidisciplinary teams, and the realities associated with implementation of data management strategies and new applications. Therefore, if actuaries outline the requirements, IT teams can propose solutions that meet these needs while also staying on course with the company’s technology roadmap.

Leading the Way

Leaders across the company must exemplify change management best practices and become change ambassadors. They must exhibit behaviors that challenge outdated and archaic processes. In many cases, organizations must disband old processes completely and avoid forcing them into new technologies to optimize the full potential of the new capabilities deployed. Inciting employees to get on board with developing technologies will further reinforce the acceptance of the new applications, capabilities, processes and skills.

Critical components of change management include both organizational leadership and personal aspects. When employees are inspired to learn new behaviors and energized by those around them, they will be able to better support the evolution of their organization’s goals. Leaders must explain personal aspects of change management—for example, how change will impact an individual’s role and responsibilities, how current competencies will be applied in the new environment, and what type of additional training and development (if any) are necessary to shepherd individuals through change. When leadership creates an environment where historical experience is partnered with fresh perspective, employees



According to SunGard, **60 percent** of insurance organizations noted that improved automation of data feeds and enhanced reporting were key improvement areas in 2018.

are emboldened to subtly challenge—and change—outdated behaviors.

Change at the Individual Level

In addition to leadership support for change management, it is critical for individuals to propel themselves forward. Actuaries must be receptive to refreshing their skill sets to align with the rapidly shifting environment. A study performed by McKinsey Global Institute across Western European insurers found that as much as 25 percent of full-time positions in the insurance industry may be consolidated or replaced between 2015–2025—the majority of which are operational in nature and due to automation.⁶ As such, those in the actuarial profession must have the willingness—and confidence in themselves—to develop the competencies to acclimate to the new realities of work. Employees must believe in their own capabilities or have the desire to better their skill set in order to keep up with the rapid pace of change. While an Accenture survey cited 57 percent of workers as having a high estimation of their own skill set as well as a high willingness to work with intelligent technologies, the remaining 43 percent did not.⁷ Leadership support to address this gap through continuous learning and encouragement is necessary.

Optimal organizational impact can be achieved by blending technology with the human element. Embracing network leadership can foster the spirit of partnership and change management, wherein companies benefit from community-driven decision-making. A partnership across actuarial functions, business and IT is essential in establishing a shared vision of the future state—particularly

NETWORK LEADERSHIP

With advances in technology and the rise of social media platforms, there are constant reminders of the power that comes from having a strong network. Network leadership is the concept that organizations can become more effective by creating teams of people across different departments, functional disciplines and even site locations to respond to business challenges. These multidisciplinary groups, of which both actuaries and information technology (IT) personnel are critical, are empowered to make decisions. While organizations traditionally have relied upon a single role within reporting structures for the most effective way of decision-making, network leadership puts the accountability in the hands of a group as a shared responsibility.

The Monitor Institute characterizes network leadership as collective, facilitative, emergent, relational, connected and a bottoms-up approach; conversely, organizational leadership is regarded as individual, authoritative, controlling, directive, transactional and a top-down approach.¹

Network leadership relies on the creation of quality relationships built over time and an established environment of trust—which allow for a communal culture. This approach enables the team to clarify direction, establish alignment and garner commitment from a variety of stakeholders as broader understanding and buy-in is established. As the collective evolves, where each individual falls on the organizational hierarchy becomes irrelevant, blurring the distinction between leader and follower. Depending on circumstances, all individuals will be both leaders and followers at different times as various issues are brought forth for resolution. Actuarial and IT departments, along with other functional areas, play a critical role in network leadership—particularly as companies continue to evolve and manage through technological change. Mila N. Baker, author of *Peer to Peer Leadership*, eloquently summarized a network community as follows: “Everyone is involved in creating and working toward that same common purpose and vision ... everyone is equal and all are able to act.”

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around data management and the overall data strategy. Similarly, cross-discipline decision-makers must be willing to commit to this vision to minimize resulting disruptions on their teams, while concurrently supporting the future path. By uniting across IT and actuarial disciplines, organizations will be better positioned to successfully navigate through the rapidly changing environment and effectuate transformation. As Argentinian revolutionary Ernesto “Che” Guevara said, “Remember that the revolution is what is important, and each one of us, alone, is worth nothing.” ■

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LEARN MORE ONLINE!

To learn more about Network Leadership, refer to “What is Network Leadership?” by Curtis Ogden at nextgenlearning.org/articles/what-is-network-leadership.

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POSITION ANNOUNCEMENT

Editor of the *North American Actuarial Journal*



The Society of Actuaries (SOA) invites applications and nominations for the position of Editor of the *North American Actuarial Journal (NAAJ)*. More information about the NAAJ can be found at <https://www.soa.org/publications/publications-landing/>.

Position Description

The Editor has overall responsibility for assuring the timely and efficient publication of the *North American Actuarial Journal*. The chosen applicant will serve as Editor-Elect beginning Summer 2019 and start the term as Editor beginning January 1, 2020. The Society of Actuaries will provide an honorarium to the Editor.

NAAJ Information

The *NAAJ* scientifically addresses the domestic and international problems, interests, and concerns of actuaries, their customers, and public policy decision makers. The *NAAJ* publishes papers from traditional fields of actuarial practice, such as life and health insurance, pensions, employee benefits, property and casualty insurance, and finance and investments. Papers from new or developing areas of actuarial practice are especially welcome. We seek to stimulate research on emerging public policy debate, technology improvements, demographic trends, multidisciplinary topics, globalization issues, and the like.

EDITOR RESPONSIBILITIES

The Editor will perform the normal duties associated with academic journal editorship such as:

- With the guidance of the Editorial Board and SOA staff partners, determine editorial policies and procedures.
- Promote the *NAAJ* as a forum for actuarial practice through dedicated special issues on current topics, topic conferences, case studies, and so on, as well as solicit manuscripts on topics of emerging importance.
- Recruit, appoint, and motivate Co-Editors, Associate Editors, and Reviewers.
- Supervise the review of manuscripts submitted for publication in the *NAAJ* and attend monthly phone meetings with the Editorial Board to discuss papers under submission.
- Work closely with the Society of Actuaries, including attendance at monthly phone meetings with SOA staff, to assure the timely and efficient publication of each issue.
- Seek ways to expand *NAAJ* circulation, reach, and impact by increasing citations in an effort to appear on the Thomson Reuters Journal Citation Report.
- Support a manuscript review/tracking process that promotes conscientious and expeditious article evaluation, resulting in a timely response to authors.
- Work with Co-Editors and SOA staff to award the Annual Prize for the best paper published in the *NAAJ*.
- Prior to serving as Editor, the chosen applicant will serve as a Editor-Elect and shadow the current Editor.

DESIRED EDITOR QUALIFICATIONS

- A strong publication record in leading journals in actuarial science or related fields, including the *NAAJ*, and the academic reputation to recruit and retain esteemed Co-Editors and Associate Editors.
- A commitment to promoting significant scholarly research, and to maintaining and improving upon the *NAAJ*'s editorial standards.
- A reputation for fairness, objectivity, and integrity.
- Managerial and administrative skills necessary to assure the timely publication of the *NAAJ*, including the ability to motivate Co-Editors, Associate Editors, and Reviewers.
- Significant editorial experience either as an Editor or an Associate Editor of a major journal (preferred but not required).
- Evidence of a long-term commitment to actuarial science, such as through research on topics of actuarial interest or membership of a recognized body within the International Actuarial Association (e.g., Fellow or Associate of the Society of Actuaries, Fellow of the Casualty Actuarial Society, and Member of the American Academy of Actuaries).
- Creative and innovative thinking, ability to expand the reach and impact of the *NAAJ*.

APPLICATION PROCEDURES

Interested applicants should submit letters of interest by April 15, 2019, to Professor Edward W. (Jed) Frees, Risk and Insurance, Wisconsin School of Business, at jfrees@bus.wisc.edu. Applicants should attach a curriculum vitae. The intent of the letter of interest is to offer reasons why the applicant wishes to be Editor and how the applicant will integrate his/her editorial responsibilities with other academic duties. More information on the *NAAJ* is available at <http://www.tandfonline.com/loi/uaaj20>.

EXPERT ADVICE

A True Team Player

Q&A with Eileen Burns, FSA, MAAA, principal and consulting actuary at Milliman

How are you using predictive analytics in your job?

I use predictive analytics as a tool to study policyholder behavior and other insurance-related experience to help inform business expectations and decisions. Two examples include when variable annuity (VA) policyholders start utilizing a guaranteed lifetime withdrawal benefit (GLWB) rider and how different underwriting questions lead to differences in mortality experience.

Our team may use a different analytical strategy for each project. For an industry experience analysis, we may use a relatively simple model. Alternatively, with an industry-sized data set, we're likely to have the quantity of data needed for a much more complex model, so we may opt to use machine learning and model explainers to gain further insights, accepting the impact on implementation. Overall, we try to show how new analytical methods can be an improvement over those that have sustained us to date.

How do you define success?

Success in my job is somewhat hard to define because it's not one concluding event. When you look at the world beyond the insurance industry, it's clear that:

- » We have a lot further to go with the adoption of predictive analytics.
- » Many more aspects of actuarial work can be improved by using predictive analytics.

Our job is to keep moving the bar. Sometimes that means taking a side-step to focus on improving how the results of predictive analytics efforts are absorbed by stakeholders through visualization tools. Anything

we can do to increase the understanding of what can be accomplished with analytics helps the industry move forward. So I'd say success for me and my team is about whether we feel good enough about what we have done and what we are doing that we keep going, looking for what is next.

How important is teamwork in the workplace?

There are a lot of pieces that need to go right in order for us to complete our work, and no one person could accomplish all of them. We must function as a team, which involves being aware of other team members' work, offering help when needed and trusting other team members. And, of course, work is a lot more fun as a team.

What skills positioned you for work in predictive analytics?

The hard skills that positioned me for work in predictive analytics were statistics, programming in R, visualization techniques and the business understanding I gained earning my FSA. More and more, our team also needs to have skills in data management and computing, but those are not areas that I've continued to develop personally.

As a principal, I find there are other skills that help me do my job. Being able to communicate with both technical and nontechnical audiences and anticipate the questions and concerns important to each audience has been very helpful. Leadership is another important skill for people at all levels. One of the most critical roles of any leader is having a vision, honing it and communicating it to your team and stakeholders. ■



PHOTO: MEGHANN PROUSE

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ONLINE!**

Read the full Q&A at
TheActuaryMagazine.
org/Team-Player.

Eileen Burns can be reached at eileen.burns@milliman.com.

Championing Diversity and Inclusion

INTERVIEW BY YING ZHAO

Craig Reynolds, FSA, MAAA, is a principal and consulting actuary, and a lead of the Life Insurance consulting practice of Milliman's Seattle office. Many actuaries know Craig from his numerous volunteer roles with the Society of Actuaries (SOA), including serving as a past president of the SOA. In 2018, Craig was the chair of the SOA's Inclusion and Diversity Committee and the Joint Committee on Career Encouragement and Actuarial Diversity (JCCEAD or JC), a joint SOA and Casualty Actuarial Society (CAS) Committee on actuarial diversity. As a vocal leader and tireless promoter of diversity in the actuarial profession, Craig has led many initiatives advocating for and improving diversity and inclusion both within and outside of the SOA. I recently sat down with Craig and discussed his career and passion for a more diverse and inclusive actuarial profession.

How did you start your personal involvement in Diversity and Inclusion (D&I) programs at your workplace and at the SOA?

A: My first experience with D&I was through the SOA rather than through Milliman. Around five or six years ago, I volunteered to serve on the JCCEAD to see what I could do in this field.

There were two things that inspired me to do that. One was John Robinson, FSA, MAAA, FCA, who currently works for the Minnesota Department of Insurance. John is from the Caribbean, and he happens to be black. John served on the SOA Board with me and helped me think about the organization not being as diverse as it should be. John presented to the Board on this topic, and what he said really struck a chord in me. I realized that this is an area where the organization could and should do better, and it will make the profession stronger if we succeed.

The other angle is that my daughters are now 23 and 25 years old, and they are entering the workforce. This made me look around at our profession and realize that there aren't enough women. We have an overall membership that is barely more than 30 percent female. While this is much better than many science, technology, engineering and math (STEM) professions, we're certainly lagging behind other professions significantly, like accounting and the medical fields—they're both around 50 percent female. We must attract more women to the profession and foster an environment inclusive to leadership for everyone. I would like to see both of those things happen. We want more women running for SOA leadership positions and reaching leadership roles in insurance companies and consulting firms. The SOA supports industry initiatives that further that goal.

"Cultivate a diverse membership" was introduced in the SOA's 2017-2021 Strategic Plan. What was the process of developing the Strategic Plan and including D&I initiatives?

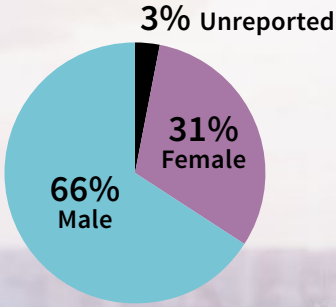
A: The SOA formed an Inclusion and Diversity Committee (IDC) a few years back and released a diversity statement. It says diversity is important to the organization and that we welcome people from all backgrounds:

The Society of Actuaries (SOA) best fulfills its mission when it is diverse and inclusive of all individuals. Openness to and acceptance of diverse perspectives, cultures and backgrounds helps to attract the best talent and ensures the overall inclusivity of the actuarial profession.

The SOA welcomes the membership and participation of all individuals, regardless of race, ethnicity, religion, age, gender, sexual orientation, gender identity or expression, disability, or national origin.



SOA Membership



Once we adopted this philosophy for the organization, we needed to take action. We included D&I in the Strategic Plan as a direct recognition that our organization is stronger when we have a diverse membership. We received unanimous support from the Board. The debate is never about whether we should be working on this, but rather how to start.

Most of us would say our profession is a meritocracy—we have an exam system to make sure you’re fit to be an actuary. Most employers use the exam system to determine what level to place people in the firm. And some people would say that’s all we need to do—have a race-blind and gender-blind process to get people into the profession, and then our job is done. I disagree with that on several fronts. One of the key issues is that we need to have the right people attempting these exams. There is a large segment of the population that doesn’t know about our profession.

One of the barriers that our 2017 research study found is that the awareness of the actuarial profession at the college level among non-Latino and non-African-American students is twice as high as it is for Latino and African-American students. That tells me that we have work to do to make sure that anyone who might be good at our profession knows about it. Currently, the SOA is leading a task force with other actuarial organizations and employers to address this lack of awareness. It is a big play and, if done well, we expect to be reporting actual progress back to members in the coming years instead of just talking about it.

Many companies, especially large insurance companies and consulting firms, have their own D&I programs. Can we rely on the employers to address these issues? Why does the SOA need to work on this?

A: First of all, I’m glad employers have those programs. Most company-sponsored D&I programs are about the firm as a whole and not about the actuarial positions in particular. I’m simplifying things, but a company might have one department that is 20 percent African-Americans and another one that has zero African-Americans and think that the company is doing well with 10 percent in total. The problem is not all positions are equal. We know that the actuarial path is a common route for growing into a leadership role in many organizations. The composition of our profession should reflect the environment in which it operates.

Second, many actuarial jobs are with small firms. Some small companies have little ability to address D&I. And when they do, they’re especially vulnerable to the fact that they have little leverage to grow the pipeline. They can try their best to have a nondiscriminatory hiring practice. But attracting new people from underrepresented groups will require a concerted broad-based effort—and the SOA’s help. ■

READ MORE ONLINE!

Read a continuation of this Q&A at TheActuaryMagazine.org/Champion.

A SECOND INSTALLMENT

Read the leadership and diversity and inclusion practice portion of this interview in the March 2019 issue of *The Stepping Stone*, the newsletter of the SOA Leadership & Development Section. Visit bit.ly/SOA-Stepping-Stone.

ABOUT THE INTERVIEWER

YING ZHAO, FSA, MAAA, is AVP, Product Management, at Lincoln Benefit Life in Illinois. She can be reached at ying.zhao@lbi.com.

CAE: Looking Back on 10 Years of Excellence

BY GENA LONG AND STUART KLUGMAN

The Society of Actuaries (SOA) Board of Directors established the Centers of Actuarial Excellence (CAE) program in 2008 as part of a suite of initiatives to strengthen the profession's academic branch. SOA academic connections at that time were tenuous at best, and the profession had no standardized way to influence the education of its student actuaries. The Board believed that universities represented an important source of education and research that could be enhanced through working with the SOA to develop stronger connections with industry and the profession.



The CAE program identifies actuarial science programs that embody a dynamic and broad curriculum, quality research and strong connections to industry. But the key success of the program has been its ability to motivate universities to use the eight CAE criteria (see sidebar) as a benchmark for improvement. Having such criteria has allowed program leaders to approach their administration for needed resources as well as to enhance their program's offerings to align with the SOA's expectations. Over the past 10 years, we have seen many programs strive for and ultimately earn CAE status.

CAE Benefits for the Profession

The strong university connections made through the CAE program benefit the SOA and its membership. The CAE curriculum criteria help to ensure actuarial education at these universities meets the ever-changing demands of the profession. CAEs are currently adding enhanced statistical education and predictive analytics components to their courses due to the changing actuarial environment and the new requirements on our ASA syllabus.

International Development

In 2014, the SOA Board approved an international expansion of the CAE program. This was significant to all CAEs, as they became part of a global assembly of quality actuarial programs. This development has put the CAE program in a position to showcase the SOA globally and support the SOA's increased international focus. It has helped build

strong connections to top-tier actuarial programs at universities worldwide and aids in the development of actuarial intellectual capital. Outside of North America there are now CAE programs in Australia, China, Hong Kong and Scotland.

CAE Review and Survey

In 2013, the SOA Board conducted an analysis of the CAE program. They surveyed members of the academic community and CAE volunteers. Universities affirmed the eight CAE criteria, reporting positive effects in both maintaining program standards and encouraging further program development.

Overall, CAE universities were very positive about the program and its benefits. Ninety-two percent said the award of CAE status had been somewhat or very beneficial to their program. They cited improvements in attracting students and employers to the program and strengthening the status of the program within the university, including securing additional faculty positions.

Respondents also cited the value of having clear standards for actuarial science programs to share with university administrators. Overall, the research indicated the CAE program was working well, and the Board approved continuation of the program with minor clarifications and process adjustments.

Well-rounded Actuarial Education

CAE programs exemplify the importance of interdisciplinary education. Beyond preparing students for the actuarial exams, each program works to integrate business and communication skills. This integration is done through case studies, research projects, and by requiring or encouraging actuarial science students to attend classes offered by other departments. Serving as guest speakers, adjunct faculty and advisory board members, actuaries in industry (including alumni) provide direction and insight to the faculty and students. Through this involvement, CAE faculty members establish long-term relationships with alumni and the business community. These relationships keep faculty and students tuned into the latest developments within the profession.

Looking Back

Over the last 10 years, the CAE label has become a recognized brand of quality for students seeking an actuarial education and for employers looking to recruit outstanding talent. The program has exceeded expectations regarding the number of universities now included in its ranks—there are 33 CAE universities worldwide as

CAE CRITERIA

The Centers of Actuarial Excellence (CAE) standards help ensure a university can sustain a robust program of education, research and scholarship. Universities seeking to be a CAE must apply for and meet four quantifiable A Criteria and four qualitative B Criteria:

A Criteria

- » Criterion A.1: Identifiable major/degree in actuarial science
- » Criterion A.2: Curriculum coverage at 80 percent or better on four of the seven preliminary exams, with at least one being LTAM or STAM
- » Criterion A.3: Number of graduates averages 10 or more per year
- » Criterion A.4: Faculty composition includes credentialed actuaries

B Criteria

- » Criterion B.1: High-quality graduates as demonstrated by job placement, exam passing and so on
- » Criterion B.2: Integration with business/communication fields
- » Criterion B.3: Connection to industry
- » Criterion B.4: Peer-reviewed actuarial research and other professional contributions

Visit SOA.org/CAE for more information about our Centers for Actuarial Excellence and a listing of CAE universities.

of Jan. 1, 2019. The positive influence that the rigorous criteria has had for universities is also a key to the success of the program and is resulting in continued improvement in the education of actuaries. We look forward to seeing where the next 10 years will take us. ■

ABOUT THE WRITERS

GENA LONG is director, Professionalism and University Relations, at the Society of Actuaries. She can be reached at glong@soa.org.

STUART KLUGMAN, FSA, CERA, is senior staff fellow, Education, at the Society of Actuaries. He can be reached at sklugman@soa.org.

New Technologies, Data Analysis and Forecasting

Q&A with R. Dale Hall

Managing director of research at the Society of Actuaries (SOA), R. Dale Hall, provides research insights on technology and new practices. The SOA develops and sponsors a variety of research projects and studies involving data analysis, developments in new technologies, modeling approaches, forecasting and other innovations in the insurance industry.

Can you tell us about the recent machine learning research report on insurance claims?

Hall: We wanted to better understand machine learning methods for insurance applications, so this research helps fill in gaps in how generalized linear models are used for modeling claims. This research covers a lot of ground, providing both a literature review and survey analysis on machine learning methods. This report gets more technical, exploring model formulas and parameters of the different methods. It's helpful to see these ideas—from the approaches with random forests to regression trees—on paper. This type of research aims to expand our understanding in new areas and approaches, and I encourage you to learn more about it.

What developments are you seeing with autonomous vehicles?

Hall: We recently gathered several industry experts and actuaries to discuss automated vehicle systems and the market. We found it important to provide our members

and the industry with a snapshot of automated vehicles and the implications for our profession and the overall insurance industry. Our report focuses on the potential rollout and adoption of automated systems. The researchers bucketed the automated vehicle systems into three types:

- 1 | Vehicles with safety feature technologies
- 2 | Self-driving systems
- 3 | Completely driverless systems

Several factors are considered, from policy implications to public acceptance. These “trigger points” will each affect how swiftly automated systems are rolled out and adopted. It's too soon to know all of the specifics, which is why this report helps fill in some of the gray areas and offers a variety of trigger points we should be looking for that can influence the speed of adoption. It was extremely helpful having a project review group spanning across the actuarial profession, insurance industry and government transportation agencies. Look for more information and updates as we continue to expand our understanding of the implications for the industry and the role actuaries can serve in this space.

Can you share updates on some of the recent technology and forecasting projects?

Hall: The SOA released two China-specific research projects, both of which connect with technology and data analysis projections. I'm glad to see these projects

released, as they cover China-specific issues, from population estimates to technology developments affecting the insurance markets there.

For instance, one study examined the communication technology of WeChat and online marketing for insurance products in China. For those of you not familiar with WeChat, it is a rapidly growing social media application in China, with more than 300 million subscribers. It's quickly become the go-to place to market insurance products online. Our research digs into the details of how life and health insurance companies are marketing to consumers in China through WeChat. We also found there's increased potential through WeChat Pay options and reaching customers through customer service via the app. This is important information to know for the Chinese market, and it also may have implications to consider for the rest of the world, as insurance distribution and customer engagement grow online.

Another recent project in China forecasted the country's population structure in the coming decades. Essentially, we looked at projections of both the mortality and fertility rates of the Chinese population. I find this analysis interesting, as it compares China's mortality patterns to other developed countries with higher life expectancy levels and greater data quality. By 2065, a large part of China's population will be 70 to 80 years old. There are major implications for its social security system, including a possible deficit by 2030. It's a fascinating read, and I encourage you to check out both projects.

What other projects are in development?

Hall: I'm especially proud of the new research coming out later this year from the SOA Strategic Research Program on Actuarial Innovation and Technology. It's one of the SOA's five strategic research programs. Look to see some very interesting research coming up on the evolution of technology and what it means for our profession. We're developing several research projects and studies involving technology and population trends. Stay tuned for updates as we explore how new technologies impact current and future actuarial work. ■

ABOUT THE WRITER

R. DALE HALL, FSA, CERA, CFA, MAAA, is managing director of Research at the Society of Actuaries. He can be reached at dhall@soa.org.

RELATED LINKS

Automated Vehicle Market Framework

bit.ly/SOA-Automated-Vehicles

Machine Learning Methods

bit.ly/Machine-Learning-Methods-SOA

Modeling and Forecasting Chinese Population Dynamics

bit.ly/Chinese-Pop-Dynamics

WeChat Marketing Distribution

bit.ly/SOA-WeChat

SOA Strategic Research Programs

SOA.org/strategic-research/default

Visit SOA.org/Research for the latest updates on new research opportunities, data requests, experience studies and completed research projects.

RESEARCH READS

Initiative 18|11

The Society of Actuaries (SOA) and the Kaiser Family Foundation released findings from Initiative 18|11, a project that explores the rising cost of health care in the United States. The initiative's name refers to health care representing 18 percent of the gross domestic product in the United States, contrasted with 11 percent in comparable countries. The report examines the drivers of health costs and potential solutions to address the cost of care. Download the report and access the videos.

SOA.org/research/topics/initiative-1811/

Outlook for Automated Vehicles

The transportation industry is facing a series of challenges with automation technologies. A new SOA report explores the trigger points that may lead to changes in the industry. Get the latest research and podcast on automated vehicles.

bit.ly/SOA-Automated-Vehicles

FRESH PERSPECTIVES



Meetings

Enterprise Risk Management (ERM) Symposium

May 2–3, Orlando, Florida

The ERM Symposium provides thought leadership, best practices and networking opportunities for professionals working in the many aspects of enterprise risk management. Register now at bit.ly/2019-ERM.



Life & Annuity Symposium

May 20–21, Tampa, Florida

This symposium is the world's most comprehensive event for actuaries in the life industry. If you're a technical expert or business professional servicing life insurance products, this symposium was designed with you in mind. Don't miss this premier event. Learn more at bit.ly/SOA-2019-LAS.

Video

From Startup to CEO

Timothy Paris, FSA, MAAA, began his career at a startup insurance company. Today, he is the CEO of a consulting company. In this video, he explains how predictive analytics and his actuarial background helped shape his career. Watch now at bit.ly/TParis-Video.

Article

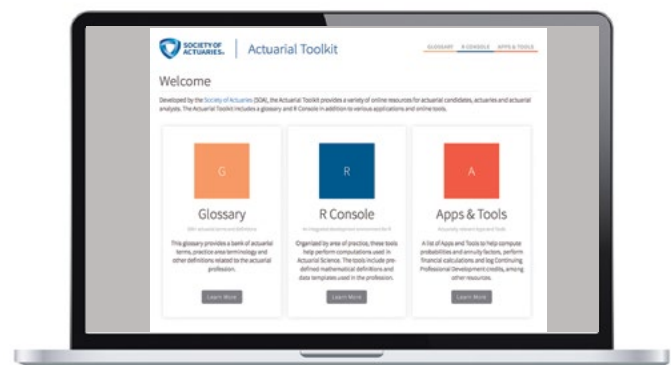
Predictive Analytics Problem Solver

For Patrick Getzen, FSA, MAAA, his actuarial background served as the foundation for his current role as SVP and chief data and analytics officer for Blue Cross Blue Shield of North Carolina. His analytical skills and problem-solving abilities paved the way for his nontraditional career. Learn more at bit.ly/SOA-Getzen.

Resource

New—Actuarial Toolkit

The Society of Actuaries (SOA) has completed development of the Actuarial Toolkit—a new online resource for members, candidates and students. The toolkit contains a glossary of more than 700 actuarial terms, an R Console for computations and a crowdsourced list of applications available online. Log in and bookmark your favorite tools at actuarialtoolkit.SOA.org.



DISCIPLINE NOTICE

Notice of Disciplinary Action

On Oct. 9, 2018, the Society of Actuaries (SOA) convened a Discipline Committee to review a matter referred by the Actuarial Board for Counseling and Discipline (ABCD). Following deliberations, the Discipline Committee expelled Patrick E. Sutherland, FSA, from the SOA for material violations of the *Code of Professional Conduct (Code)*, specifically Precept 1,¹ effective Oct. 26, 2018.

On Sept. 17, 2015, the Grand Jury for the Western District of North Carolina returned a Bill of Indictment against Mr. Sutherland, alleging a tax fraud and obstruction of justice scheme. A jury found Mr. Sutherland guilty of all counts. On June 21, 2017, a U.S. District Judge sentenced Mr. Sutherland to 33 months in prison, followed by three years of supervised release.

The Discipline Committee reviewed and discussed the materials and exhibits relating to Mr. Sutherland's conduct. The SOA Discipline Committee determined that through his repeated, premeditated filing of fraudulent tax returns and providing false documents and information to the federal government and the ABCD, Mr. Sutherland materially violated Precept 1 of the *Code*. Mr. Sutherland's conduct resulted in public harm and reflects adversely on the actuarial profession and his fitness to serve as an actuary.

Given the SOA's role within a self-regulating profession, the Discipline Committee believes that the personal and professional integrity of actuaries is vital. As such, the Discipline Committee expelled Mr. Sutherland from the SOA for his material violations of the *Code's* professional and ethical standards.

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

Reference

¹ **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.

Listen at Your Own Risk



Stay tuned to thought-provoking topics affecting the actuarial practice. Listen as host Andy Ferris, FSA, FCA, MAAA, leads his guests through insightful discussions on the latest actuarial trends and challenges.

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Timeless

THE PAST, PRESENT AND FUTURE OF THE SOA

1949

The calculation tools actuaries used in 1949—when the Society of Actuaries (SOA) was founded—were much different than the technology of today. Let's wind the clock back a bit and see what actuarial work was like in 1949.

Calculators and Computers

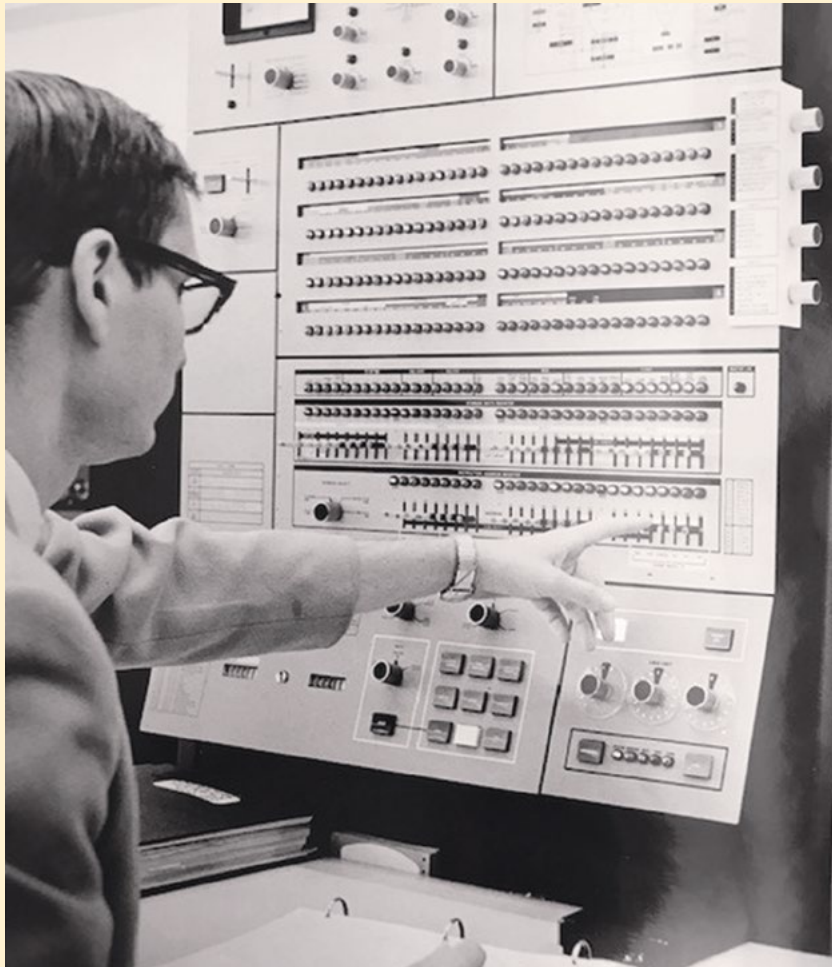
- » Worksheets relied on hand calculations using simple arithmetic. Often, each number was recalculated independently to catch errors.
- » Mechanical desktop calculators had the user turn a crank with one hand to add or multiply a column, then move the carriage with the other hand to get to the next column of numbers.

Actuarial Formulas and Models

- » Computations often were run at five-year intervals.
- » Investment yields sometimes were derived by logarithmic formulas.
- » Mortality tables contained static rates based on experience, with annuity tables including a margin to allow for improvement.
- » Financial projections of assets and liabilities for a life company or pension plan were done infrequently because of the heavy calculations needed for even one set of assumptions.

Source

Greb, Richard. 1999. *The First 50 Years: Society of Actuaries 1949-1999*, 52-53. Schaumburg, IL: Society of Actuaries.



The IBM 650 was used around 1956. The 650 was one of IBM's first computers marketed as a true general-purpose computer with a full set of decimal arithmetic, logical and control instructions.

VISIT US ONLINE!

For information about tools and resources available to actuaries via the SOA, go to [SOA.org](https://www.soa.org) and click on the Tools and Resources tab. We've come a long way!



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- Life & Annuity Symposium
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- Valuation Actuary Symposium
- Annual Meeting & Exhibit

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