



SOCIETY OF  
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ACTUARY OF THE  
FUTURE SECTION

# Actuary of the Future

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# Actuary of the Future

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# Letter From the Editor: Design the Future

By Xiaochuan (Mark) Li

**W**elcome to the fall 2017 issue of the Actuary of Future (AOF) section newsletter. In this issue, we have articles that culminate the series on competence framework and writing skills. Two actuaries share their personal stories about their international working experience. There is also an article on the impact of technology on the insurance industry and a review of a book about how to prepare for actuarial exams.

First is the article from our outgoing chairperson, Bin Fang, who gives a wrap-up about the activities and initiatives AOF has done this year: AOF has strengthened its alliance with the Society of Actuaries (SOA) Candidate Connect program, supported university conferences, presented fresh topics at SOA meetings and conducted many other activities. AOF, as a main bridge to connect new actuaries and the SOA, is committed to helping aspiring actuaries stay current and gain skills.

Becoming an actuary is not an easy journey. The main challenge at the early stage of a career is passing actuarial exams, which requires years of commitment and study. How to more effectively prepare for exams and balance study, work and life is a challenge to everyone who chooses to take this path. Dave Snell has contributed a review of an important new guide for actuarial students, *Actuarial Exam Tactics: Learn More, Study Less*, and surprisingly, it lives up to the claims its title makes. Roy Ju was the youngest FSA ever, and he also had a very active life beyond his studies. Read about how he accomplished this. Dave found the book full of surprises that, after some additional thought, make a lot of sense. This may be a valuable reference for any student.

Nowadays many insurance companies are global players with a business presence around the world. Joining those companies gives actuaries opportunities to work abroad and will be an exciting and at the same time challenging undertaking. In this issue, two young actuaries share interesting stories of their

international working experiences. By overcoming challenges in a new country, understanding people in the business and learning how to coordinate study with work and life, ultimately both think that international experiences are fulfilling.

A major trend in insurance industry is the rapid embracing of technology. Machine learning, deep learning, blockchain, AI— all are common terms in industry publications. Alex Daskalov's article illustrates the driving force behind the trend. This change is not simply integrating technology in normal business processes, but disrupting old business models and creating new business opportunities. As actuaries, we have to think about if some of the predictions are realized in five years, can we adapt well to these changes?

The last of a three-part series, "The Competency Framework: Design Your Future" by Richard Junker and Curtis Lee Robbins, elaborates how to use the SOA Competency Framework tool to create a personal development plan. It involves a self-assessment and a plan to address the gap, but ultimately the goal is to design your future. This Competency Framework tool can provide a granular level of learning materials, hooking in to all meeting sessions from more than a half-decade of instruction by preeminent actuaries.

Last, as a continuation of the series of writing tips for actuaries, Dave Snell uses two perspectives to explain effective writing. One is for non-native English speakers writing for English readers; the other native English speakers writing for non-native speakers. In the business environment, the main goal of good writing is clarity of communication. In addition to mastering correct language usage, writers may also consider cultural background to improve readability.

The future is not deterministic. As actuaries, we understand it means risks. But as one author said, risk is also opportunity. For new actuaries, it is very important to have an objective understanding of where we are now and what we want to do in the future. With this understanding and a plan to work on it, we are designing our future. Just like Malcolm X said, "The future belongs to those who prepare for it today." ■



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# Chairperson's Corner: 2017 Wrap-Up

By Bin Fang

*The only thing that is constant is change.*

—Heraclitus

**A**s we wrap up 2017, the United States continues to see turmoil and uncertainty in government, North Korea may have acquired the missile technology to put the continental United States within range, terrorist attacks are still in the headlines and robots are starting to create their own languages. The questions for the actuarial profession are: Are we well prepared for the perpetual changes in our society? Are we ready to adapt new technologies and help others to mitigate various risks?

In the past year, the Actuary of Future (AOF) Section has focused on several key strategic initiatives, including strengthening our alliance with the Society of Actuaries (SOA) Candidate Connect program, supporting university conferences, presenting fresh topics at the SOA meetings and conducting many other activities.

## SOCIETY OF ACTUARIES CANDIDATE CONNECT

We are very excited about this partnership. In November 2016, I was honored to present at the Candidate Connect event in Hartford, Connecticut, to more than 100 aspiring actuaries. Later in 2016, I made another presentation at the University of Houston actuarial club with the spirit of engaging local candidates in the greater Houston area, and we are currently planning to visit the group again later this year. In October 2017, I presented at the Candidate Connect event in conjunction with the SOA Annual Meeting & Exhibit in Boston. I foresee great outcomes from this partnership in coming years.

## UNIVERSITY CONFERENCES

In 2017 we kept our momentum strong. Council member Melissa Carruthers presented at the annual California Actuarial Student Summit in early 2017. In April, Melissa coordinated the AOF visit to the Columbia Actuarial Science spring end-of-semester event. If you want to know more about campus outreach, simply reach out to any council member.



## SOA MEETINGS

In 2017 we made very informative presentations at various SOA meetings. Council members Laura Wiland and Dave Snell presented at the Women's Leadership Forum at the Health Meeting. Dave also presented at the Predictive Analytics Symposium with our partners in the Technology Section. Laura Wiland and Derek Ray presented at the SOA Annual Meeting & Exhibit and cohosted a breakfast session. Continue to look for sessions hosted by the AOF at future SOA meetings.

## OTHER ACTIVITIES

The AOF section has continued a series of podcasts in 2017. The latest ones are by Melissa Caruthers and me. On behalf of the council, I want to extend my appreciation to our Section interns Mindy Lin and Edmond Eberle for all of their hard work.

The 2017 Actuarial Speculative Fiction Contest ended with a few highlights. AOF sponsored the contest with our partners in the Technology Section and Predictive Analytics and Futurism Section, and it helped to select the winner for the story with the Most Creative Actuarial Career of the Future among 24 entries. For those who are new to the event, the contest allowed a peek at the future of actuarial science, changes expected by other actuaries, plus general futuristic ideas and actuarial dreams shared by the most creative actuarial minds in the world!

In closing, I invite you to attend the upcoming events and mingle with our council members and friends. You may find useful information by visiting the Actuary of the Future Section online: <https://www.soa.org/sections/actuary-of-future/aof-landing/>. ■



Bin Fang, FSA, MAAA, Ph.D., is outgoing chairperson of the Actuary of the Future Section. He is director and actuary at AIG, and graduated from the University of Rochester. He can be reached at [bin.fang@aig.com](mailto:bin.fang@aig.com).

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# Actuarial Exam Tactics: Learn More, Study Less

Book Review by Dave Snell

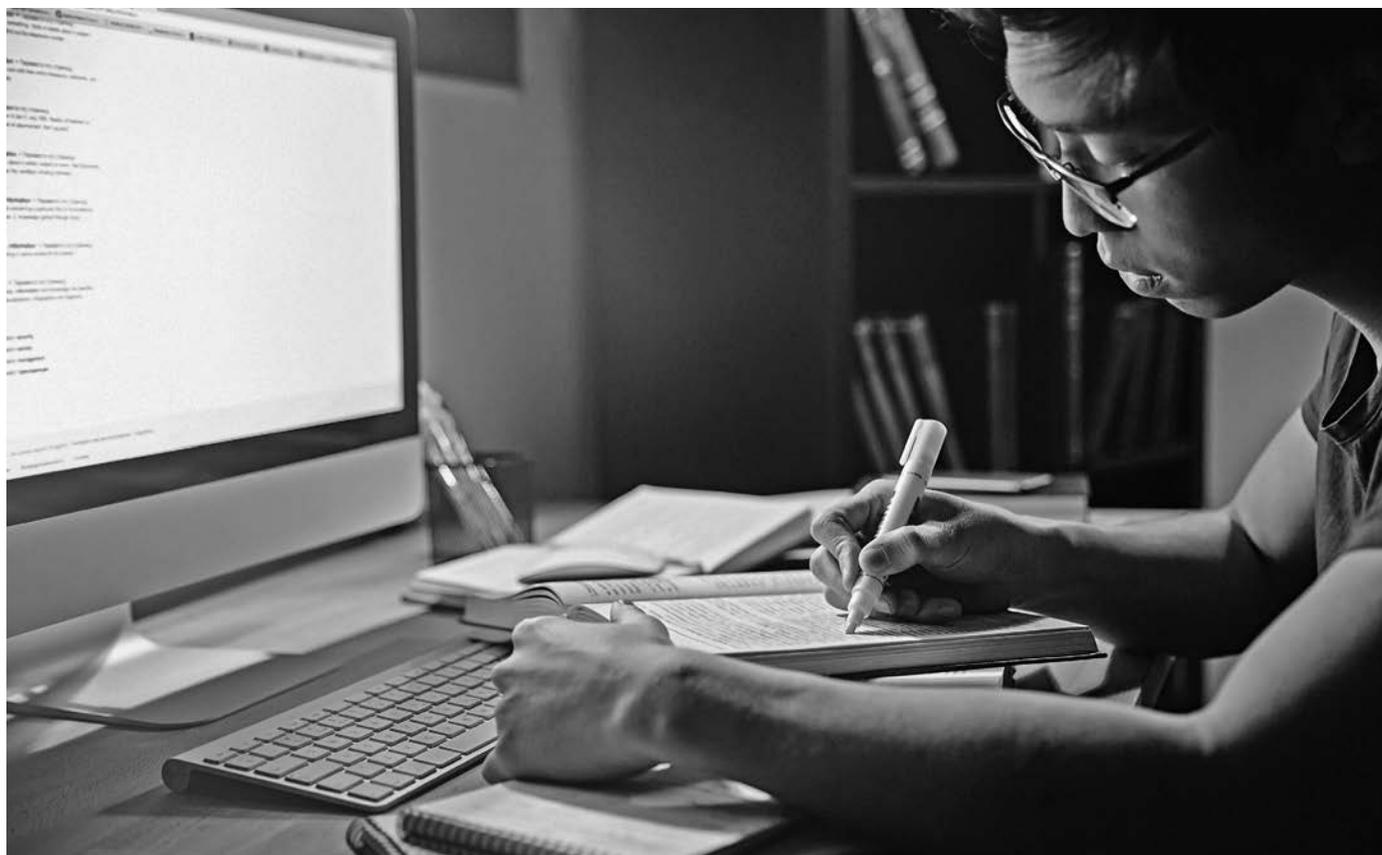
I'll start this review by sharing my preconceived biases up front. When I was contacted by the publisher to review this book by Mike Jennings and Roy Ju, I was somewhat skeptical that it would live up to the title. I had read about Roy Ju. He had become somewhat famous in the actuarial world by becoming the youngest FSA ever.<sup>1</sup> Roy earned his FSA while still a junior in college!

My initial assumptions were that he was exceptionally smart and that he was a complete nerd who lived and breathed actuarial science to the exclusion of a normal and enjoyable life with

other pursuits. Perhaps he was even driven to study all the time by ambitious parents who insisted he become an actuary.

In fact, my first premise was very likely correct. Roy is a very smart person. However, he is not a nerd. In addition to his actuarial achievements, Roy was a top-ranked high school tennis player in his state, and he was also a trombone player—not just somebody who occasionally played the trombone, but one who played all-state for his high school. The real surprise was that Roy seemed to spend less time than most students studying for actuarial exams, yet he passed them—sometimes multiple exams in one sitting. He didn't spend as much time studying because he was too busy with other projects, like board games with his friends (he introduced insurance into his Monopoly games!). At Drake University he was also president of an investment club and vice president of the Drake International Traders of Iowa. Oh, and his parents were not pressuring him to become an actuary. Initially, they wanted him to become a doctor.

OK, so he is bright and can multitask. I still felt there had to be a catch here. Perhaps his technique was just about effective cramming. Back in the 1980s I remember going to a couple of cram



classes at the University of Waterloo that would help us prepare for the actuarial exams. We would take dozens of practice tests until we could almost look at a test problem and immediately relate it to one very similar from our memorized databank of practice questions. Frankly, that was a short-term achievement, and months after the exam, most of that temporary knowledge was forgotten.

All that lead-in information is to let you know I was a bit of a skeptic. Then I read the book, which didn't take long. It is well under 100 pages, and you can blast through it in an hour. I took a little longer, though, because I would often stop and think about what I was reading. Some of the tips were so insightful that I wanted to ruminate on them. Some were tips I have learned independently myself over the years, but many others helped sharpen a lot of my disjointed experiential study tips into a broader, more holistic focus.

What impressed me most was that the techniques that Roy and Mike describe provide not just a faster way to study, but also a better way to study. By that, I mean they can help you prepare more quickly and effectively for a well-written exam, but beyond that they can help you better understand the material at a more conceptual level—the level that finds its way into long-term memory and stays with you through the years. It is a better way to learn!

So far I have written a lot about how great this study guide is without giving you any idea what is in it. I don't wish to give away all the secrets (buy the book; it is not expensive), but here are some major takeaways from it:

- **Focus on fundamental concepts.** Don't try to memorize formulas or proofs but try to understand them conceptually. Think about how you would explain them to a friend—especially a friend with less technical background. Force yourself to clarify the material to the point where you can write a one-page summary of it that others could understand.
- **Make notes in the margins with questions that focus on “how” and “why” rather than “what.”** Instead of just trying to parrot back the Black-Scholes formula, or its derivation, think through why it was developed, and how it came about (not just the mathematical steps).
- **Impose time constraints on your study and review time.** This sounds counterproductive at first, but the idea is to force yourself to learn to be more time-effective. Force yourself to be actively engaged in the study process—not to be just putting in time!

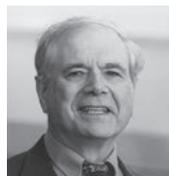
There are many tips and techniques in the book. It is not a big book with a lot of fluff, but a concise book packed with thoughtful ideas. It is a better way to learn!

Force yourself to be actively engaged in the study process—not to be just putting in time!

In fairness, I have to qualify my praise of this book. It is not easy to implement these suggested study skills. We have been trained for many years to be more passive learners, and the transformation to active engagement will be tough. Also, it won't help on a poorly designed test, like some of the old Society of Actuaries (SOA) exams I remember from the 1970s that often asked a lot of trivia just to make sure you read (and memorized) all the texts in the syllabus—even the footnotes. On the old demography and graduation exam I remember seeing a question that asked what method of interpolation was used on the American Experience table of 1936 for males between ages 30 and 35. When I read that, my first thought was that it was the dumbest, most useless question I had ever seen on an exam. Then, having memorized way too many dumb and useless facts for that exam, my second thought rushed in with “Oh! I know that one!” and I happily answered the question. I passed that exam, but I did not learn or remember much of the essence of the material. This book is for well-written exams, and to some extent it is easier to apply with well-written textbooks and study materials (although there are tips involving the use of alternative sources of subject matter expertise too).

On the bonus side, it is a set of techniques that are not limited to actuarial exams. If Roy had, as his parents wished, decided to become a doctor instead of an actuary, these tips would have served him well in that quest as well.

Buy it! Read it! Live it! It's a good lifetime investment. ■



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#### ENDNOTE

- 1 <https://www.soa.org/News-and-Publications/Publications/E-News/soa-candidate-connect/Features/2015-youngest-fsa.aspx>

# Going Abroad?

By Shirley Wu

**W**hy not? My first overseas experience was going to England for an exchange term. When I became aware of the opportunity, instead of asking myself “Why,” I asked myself “Why not?” The important considerations in my decision-making were:

- Does the exchange school offer courses that fit with my academic plan?
- Can I still secure a co-op job while I am on exchange in a different country?
- Can I continue my Society of Actuaries (SOA) exam progress without interference?

These questions were simple yes/no questions. In fact, it was all about turning a “no” into a “yes” in answering them. For instance, certain courses did not appear on the list of pre-approved exchange course credits. However, through thorough research of the program curriculum and discussions with instructors, I was able to propose new course equivalents.

As soon as I figured out solutions to all the problems at hand, I jumped on the exchange opportunity.

Everything was new and fascinating: cultures, activities, natural wonders, museums, history, landmarks, friendships and so on. All the pain from packing and moving was immediately left behind once I realized how fun and exciting this first overseas experience was. I didn’t forget about the academic side while I was having fun. Actually, all that England had to offer gave me greater motivation to study. I would always stick to my goals for studying for school and SOA exams in order to spend my spare time exploring. It was definitely a win-win situation!

Since the exchange experience, I have gone on to pursue a global career, having worked in Canada, Hong Kong, the United States and Japan thus far.

Yes, asking myself “Why not?” was key in each of my moves.

In my most recent experience working in Japan, I had the opportunity to pick up a new language. Why not? I couldn’t



think of any reason why knowing a new language would hurt me. In going from not knowing how to count in Japanese to being able to deal with daily essentials like shopping or making appointments, it was a very rewarding experience. The learning process was not easy, but it could be analogous to studying for SOA exams, which required strategy and self-discipline. Hence, picking up a new language was not only beneficial from a personal development perspective, but what I learned from the process was also very applicable and transferable to other situations in life.

Many great benefits can be gleaned from going abroad. Here are a few important ones that I would like to share from my experience:

1. In interacting and getting exposure to people from different backgrounds, you become more appreciative of similarities and differences in people. As you build cultural awareness, you can develop a more flexible work style and become more competent in solving conflicts as well.
2. You become more confident as you tackle the different issues you face in a foreign country. Your knowledge bank about the world and people expands quickly as you go through things that are not necessarily the same as in your home country. Experience brings insights and eventually boosts your confidence.
3. When you leave your comfort zone and move to a new environment, you become more independent. You develop new skills to enable yourself to deal with any situation. You will be surprised by how much more you can do!

4. The improved language skills and expanded international networks will definitely prove to be helpful down the road.

5. Last but not least, you make lifelong friends with whom you can share your growth in becoming a better person!

As Steve Jobs said, “You can’t connect the dots looking forward; you can only connect them looking backward. So you have to trust that the dots will somehow connect in your future.”

If you are still an SOA candidate, you may tend to wait until you become qualified to go abroad for work. Think twice before you reach that conclusion. Going abroad while you are a candidate is a perfect opportunity to develop multitasking and time management skills that will prove helpful in your career development.

Moving to a different country should not conflict with your studying progress. While you may encounter culture shock initially, once you pass through that period and settle down, life will definitely be more exciting than back home, with the chance to

explore. When you face different things to take care of all at once (studying, making new friends, exploring, working and so on), it gives you motivation to plan ahead, develop goals and then stick to an execution plan. Studying becomes less “painful” because it is now a smaller share of what you have to accomplish in life. When it is planned appropriately, studying for exams while working abroad could result in the best work-study-life balance than you can ever imagine. Not only will you be very impressed with how much you can do within that period, your achievement will also stand out when employers compare different candidates.

Risk is opportunity, so why not get out of your comfort zone? Bon voyage! ■



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# International Assignment: The Unexpected Turn in Life

By Manyu Wong

**M**y landing of an international assignment in Zurich when I was based in Toronto was like one of those wrong turns that took you to a part of town you never knew existed. I had just joined the company not that long before, had never thought about working in Europe and didn't speak any European languages other than English very well.

What happened four years ago seems like only yesterday. It was an early Monday morning on a hot and humid Toronto summer day. I had just moved from Quebec City to Toronto a few months before to start a new job. I was excited about my new job, moving to a new city and building a career in a reputable company. I arrived early that morning so I could delve into my study manual in peace before my colleagues started arriving. Not long after, my boss at the time passed by my desk and said "Good morning." He continued walking a few steps before retracing back his steps and asked, "Are you interested in going to Zurich?" I smiled and said "Yes." I didn't ask what, when, why, who and how, nor did I start analyzing this proposal in any logical manner. I knew that he was a manager who wanted the best for me, and for me that was enough to say "yes." It is funny how adventurous my younger self was and how that naïve and simple *yes* drastically changed the course of my next few years.

I did not prepare myself very well for the move to Switzerland and for Switzerland itself. Perhaps you have the image in your mind that an international assignee is someone who would simply need to show up at the airport, take the flight, land in a foreign country and be moved into a furnished apartment with all necessities of life dealt with by his or her company? Yes and no. Most companies try to do what they can to support international assignees. For example, most likely your company will provide you with temporary housing for a short time and engage a relocation company to help you with things such as work permit, opening a bank account and finding permanent accommodation. The truth is that the cost pressure faced by many firms nowadays means the much coveted *expat package* is given much less often and the standard *international package* is now much lighter, so more is left in your own hands. Even with

company support, being educated about residency, work permit, taxation, social security, repatriation and such things can prevent you from being blindsided by the unexpected. The impact of an international assignment on your personal and professional situations can go beyond the duration of the assignment, and that is something no one other than you can best plan for.

In today's global economy, understanding the ways of the world is a key competitive advantage for both employees and companies. Embarking on an international assignment is one way to enrich your personal and professional experience. I was fortunate enough to have been exposed to two very different cultures at a young age due to my Chinese roots and Canadian upbringing. Adding the European exposure has definitely helped me see the world with a clearer lens. I also arrived at a very interesting, albeit challenging, time for Europe: the Greek debt crisis, Switzerland's referendum to limit foreign workers, the unpegging of the Swiss franc to the euro, the migrant crisis and Brexit—just to name a few. These events have helped me learn more about Europe as it was in the past, as it is today and as it will be in the future.



## Embarking on an international assignment is one way to enrich your personal and professional experience.

An international assignment also comes with its own challenges. During my two and a half years as an international assignee in Switzerland, I always dreaded the August to October months because that was when I had to submit my annual work permit renewal application. To give a bit of background, Switzerland has one of the highest proportions of foreigners at 24.6 percent, but it also has some of the toughest immigration regulations. The recent economic turmoil faced by many European countries and the relative stability in Switzerland has made it an attractive place for many Europeans to seek work. Shortly before I arrived in Switzerland toward the end of 2014, the Swiss voted “against mass immigration.” As a consequence, the quota for work permits decreased. Switzerland has a somewhat unusual relationship with the EU in that it is not part of it, but it has many bilateral agreements with the EU. The result is it has some autonomy in deciding its immigration policy, but the EU, being Switzerland’s largest trade partner, also has significant negotiating power.

So how did this affect me? As a non-EU foreign worker, I am entitled only to a yearly renewable work permit (versus the less limited five-year work permits granted to some EU citizens), and my company must prove that they could not find a suitable person first in Switzerland, and then in the EU, to hire me. The process is very cumbersome and requires a lengthy process and heavy paperwork. At my first renewal, due to some holdup, I received my new work permit after the expiry of my old permit. I panicked and was planning for the worst in case I would have to pack and leave with less than two weeks’ notice. At my second renewal, learning from my prior experience, I did the research myself and found out that I was most likely going to be denied a work permit. So, this time I thought I also had to prepare to leave the country with two months’ notice. Fortunately, things did work out in the end, thanks in large to the support of my manager and in-house personnel.

International assignments are, by definition, limited term. So what happens afterward? Some companies have a detail road map for what you would do after when they send you away and others do not. My assignment lasted two and a half years. This was enough time for many things to change—my career aspirations, personal situation and the organization. In the end, I left the firm where I started as an actuarial student and ended as a fellow. The journey has taught me what it means to be a good actuary who understands the business and the people in the business.

So how do you get an international posting opportunity should you be interested? I think the answer varies depending on your seniority, where you want to be sent, your company’s strategies and many other factors. The reasons companies send someone to an emerging market versus a developed market are quite different. Basing my advice on anecdotal observations in Zurich, most international assignees I met were working for a company with a sizeable operation in Zurich and in their home country. I also knew a few who seized the opportunity to state their interest in an international posting to their manager, internal network or colleagues working in other locations. This eventually led to an opportunity they wanted. As for myself, the skills I gained in Toronto happened to be in demand in another project in Zurich, so getting involved in projects with international exposure and accumulating transferrable skills definitely do help.

So if I were to offer some advice to any young actuarial students, it would be to take time out of your busy study schedule and set career goals not solely about passing exams or attaining fellowship. In the short term, these are very important goals, but the weight of your career post-qualification is much heavier (hopefully). I would encourage you to treat the exam process as an intermediate, albeit significant, part of your actuarial training. Many more fulfilling experiences are waiting for you after you qualify. ■



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# A Peek Into the Future of Risk Transfer

By Alex Daskalov

As software creeps further into our personal and professional lives, it's becoming a key driver impacting market dynamics in traditional industries. Although the use of software in industries that don't typically fall under the tech umbrella is nothing new, much of its deployment in the past was of a variety used to increase efficiency in existing processes. A business might have integrated software into its business practices, gaining efficiencies in their operations, for example, by digitizing paper-based processes, but the underlying processes and business models governing its operations didn't change. In this phase, it was important for every business in a modernizing industry to adopt new technologies lest it not realize the cost savings enjoyed by its competitors, but use of software hardly reshaped industries. The incumbents weren't displaced, market shares between firms held relatively firm and the old power dynamics held constant. With their fundamental operations left mostly intact, we shouldn't expect much of any upheaval in the relationships between companies and how risk is pooled and moved.

Today we'll focus on the prospect of deeper changes. An explosion of fresh data (including the emergence of novel sources), a shift to real-time analysis, demands for new kinds of insurance products and an increasingly machine-centric society will all test the contemporary infrastructure. It will be much harder for incumbents to navigate these next sets of changes, because they don't involve simply adopting new technologies to gain efficiencies in existing processes. What once looked like a neat division between tech companies and others is blurring, as every organization races to embrace software to gain an advantage over their competitors. Incumbents in businesses not historically associated with software, across retail, transportation, hotels and many other areas, are being challenged by software companies. In the most interesting cases, the threat didn't appear as a direct assault on their core business, but a result of past business models made newly irrelevant as software spreads. This has yet to happen in as dramatic a way in the risk transfer industry, but with so much in flux, it would be wise not to discount the possibility. There's



no way to know for certain when or even if these changes will occur, but by thinking through the set of possibilities, we can try to imagine some possible futures. We can also think about changes in mindset that can be adopted regardless of which way the risk transfer industry moves as a whole, looking for better ways to operate in the context of a society of accelerating complexity and an ever-expanding role of software.

In discussing possible futures, it's always useful to consider what properties we can expect to hold as invariants. Luckily, actuarial studies are concerned with some of the most fundamental building blocks of risk transfer. We know, for example, that no matter how much the world changes, there will always be uncertainty and risk. In the insurance and reinsurance context, it will be useful to predict the probabilities of events given priors, and to price risks so they may be pooled and managed. The ability and desire to price risks isn't going away, and if anything, we're increasingly quantifying everything around us, hoping to make sounder decisions using data to reduce the element of subjectivity in our analyses. As a core discipline, actuarial studies will bear a greater responsibility for the smooth functioning of our society than ever before.

## AN EXPLOSION OF DATA

This leads us to one of the more obvious and now widely talked about changes we're seeing in the world. Having grown up in a relative scarcity of quantified data, it has become clear that the future will be one of data abundance. Already, we create 2.5 quintillion bytes of data daily. Ninety percent of all data created in human history appeared only in the last two years, and this rate is likely to accelerate with the appearance of new genres of data-generating devices. This will expose many opportunities to try different approaches to modeling.

One such advance could see us moving from purely analytical methods to statistical techniques requiring larger datasets to train models, and relaxing our demand for determinism, moving to nondeterministic models. The inclusion of predictive analytics in the upcoming Society of Actuaries (SOA) ASA exam shows how seriously this is being taken, but individuals should think forward and experiment with any novel methods that could make their way into the profession. Beyond applying new techniques for pricing, it pays to rethink what constitutes data amenable to actuarial modeling.

#### RECONSIDERING WHAT MODELS CAN CONSUME

We can expect our software-heavy future to generate reams more of the kind of data already typical of actuarial models, but software advances will also be in a position to transform mediums that weren't previously considered raw data sources. Video is one source of data that deserves special attention—both because its supply is quickly ramping up, and because it's not something we've historically considered to be a source of useful data to drive pricing models. Video streams from a multitude of sources could soon saturate us with a real-time view of everything on earth, with implications for anyone interested in consuming new data sets. What we can derive from this newly important data source is instructive, because it is an example of the advance in the role of software that we might at first skip over or misattribute to something else. Streams of video aren't new, but technological advances will transform how useful they are in an actuarial context. The number of cameras being deployed in the world is on a sharp uptick, some reasons for which will be shortly discussed. Those streams alone aren't enough, however, as video data in a native form would be very difficult to use in a modeling context.

An estimated 50 million networked CCTV cameras are deployed around the world. With a continually growing and difficult-to-measure install base, this represents a conservative estimate yielding 400 billion hours of video annually. Were we to task humans with reviewing this footage, close to 20 million people working year-round would need to be employed just to watch it, and many times more to document what they see. Luckily, what we can expect from video in the very near future, beyond the ability to record the world around us, is the ability to contextualize and understand what is being recorded, transforming it into data that can be integrated into future models. We might, for example, know at all times the height of a river bank at varying points along its length using the security footage from riverside properties. These same feeds are simultaneously capable of recording and understanding other factors useful for a natural disaster model, from precise temporal and spatial rainfall mapping to anything else that is visually perceptible.

What's more, as years pass, the data we collect will become more valuable as we refine our models in response to unforeseen rare events and accumulate increasing historical data to price future risks.

#### SOFTWARE AS A HIDDEN DRIVER OF CHANGE

We might wonder why we're tending toward a saturation in video data. An easy early insight is that camera technology is simply getting cheaper, so we can naturally expect to see more video being produced. Even this reason is strongly linked to advancing software when we dig deeper, which is surprising considering we're discussing what on the surface is just hardware. Much of what's driving down the cost of the constituent components in a modern camera is due to the proliferation of the smartphone. These have built-in cameras exposed to any app that finds a need for them. The smartphone itself is in such wide demand because it runs software that grants a person network access to the wider Internet, itself software with an expanding number of use cases, including those for processing video. Cameras so cheap that they can be attached to anything then start appearing in other peripherals, which, with the right software, can gain utility beyond simply taking photos and recording video. For example, potential future augmented reality uses cases that both serve to drive down the cost of producing cameras and increase the amount of the world being recorded in real time. Adding to this mix are autonomous cars, which by their nature need to see in every direction around them, and we can start safely assuming that we're approaching a future saturated with video.

As the complexity of society increases, due mostly to exploding technological complexity, the range of quantifiable risks increases in tandem.

For privacy reasons, we can hope that much of this video should be safe from prying eyes, but even so, the decreasing cost of deploying imaging systems means we can expect to have a real-time feed of much of the visible world. With risk models thirsting for more useful data, we can expect widespread recording paired with smart systems to deliver in spades. When we can contextualize and quantify everything we record, and can record everything visible, our ability to price risks with this novel data could become crucial to the future of the field.

This signals another big change we can expect in how we model risks. Regardless of the source of the data, whether it be video, widespread sensing devices or autonomous machines roaming the earth, the data produced are available almost immediately. At the moment, risk models mostly use historical data to price risks. In a world of vast real-time data streams, it's only natural for models to start consuming and responding to data with the same dynamism.

### NEW RISKS DEMAND NEW PRODUCTS

Understanding the compounding effects of technological change is important for appreciating the coming deluge of data, as well as what we can now do with the data, but there's another important reason we've yet to discuss. This one is especially pressing for actuarial studies, as it will exert a lot of pressure on the risk transfer industry, demanding a sharp increase in the range of effective models. As the complexity of society increases, due mostly to exploding technological complexity, the range of quantifiable risks increases in tandem.

As a result, we can expect the range of insurance products for which there is latent demand to increase as well, leading to a need to accurately model and cover an exploding number of nascent risks. Integrating a brand-new product doesn't happen overnight, but if this scenario plays out, the industry will need to learn how to do so faster than is typical today. This will place unique demands on the actuaries of the future, from how well novel risks can be accurately priced, to how quickly these models are integrated such that new insurance products can be exposed to consumers.

### A MACHINE-TO-MACHINE FUTURE

As a final word on how interconnected all these possible changes are, we need to take a closer look at the primary cedent. Today, we mostly assume a person or human organization, but this assumption may be tested in the near future. In a world increasingly saturated by software and autonomous systems, many of the nascent insurable risks will be purely machine originated. In such a world, not only can we expect a swelling in the amount of real-time data we receive from machine systems, but we can also expect many machine systems to request insurance policies to guard against the risks they face. This possible future alone is important to understand when thinking about the future of the risk transfer industry, as much of it was built predicated on a very different notion of what a primary cedent is.

We've looked at a range of technology-related pressures that might appear over the coming years and decades, and how they might affect risk transfer and actuarial studies. This is a very exciting time to be in the field, as we can expect more change in our lifetimes than everything that preceded us. It's difficult to make accurate predictions, and we're sure to be surprised at what shows up, no matter how much we prepare or try to dream up possible futures. The most important thing to adopt is an attitude of relentless experimentation. ■



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# The Competency Framework: Design Your Future (Part 3)

By Richard Junker and Curtis Lee Robbins

*Editor's note: This is the third and final article in a series covering the Society of Actuaries (SOA) Competency Framework. The first and second articles appeared in issues November 2016 and May 2017 at <https://www.soa.org/news-and-publications/newsletters/actuary-of-the-future/pub-actuary-of-the-future-newsletter-details.aspx>.*

In the first article, we addressed:

- What is the Competency Framework?
- Why the Competency Framework?
- Where are we today?
- Where will *you* be in five years?

In the second article, we addressed gearing up for designing your future.

In this culminating article, we will take up the final two questions of our quest for *Complete Actuary* competency to illustrate that the SOA Competency Framework is a powerful tool to enable you to design your future:

- How do I create my Personal Development Plan?
- How will the Competency Framework help me design my future?

## HOW DO I CREATE MY PERSONAL DEVELOPMENT PLAN?

To build on the foundation of the earlier articles, recall your “why” and your “noble purpose” for inspiring the creation of your Personal Development Plan. Let us consider concepts from “design science” and “design thinking.”

Recently, a colleague introduced me to concepts presented by R. Buckminster Fuller regarding specialization and generalists. In the 1960s, Fuller used a metaphor of “The Great Pirates” from several hundred years ago as an illustration of the idea

that overspecialization leads to a risk of extinction. To quote from an article by Zann Gill, “Fuller placed historic responsibility for specialization on the Great Pirates, whose ‘divide and conquer’ strategy fostered increasing specialization as a means to control and exploit others.” Gill further describes Fuller’s concept of “design science” in the following excerpt from his article “Buckminster Fuller’s Great Pirates: The Origins of Specialization:”<sup>1</sup>

Fuller proposed “design science” as an antidote for over-specialization, a method to recognize or envision a big picture. In the 1980s we tried to develop expert systems, which failed to realize this prediction. It was not yet time for man to be displaced as a specialist by the computer. Buckminster Fuller personally exemplified the design science principles he described. His vision for “comprehensive, anticipatory, design science” (CADS) embraced the potential for emergence of collaborative intelligence, progressing through iterative pattern recognition toward coherence. He conceived the general framework for CADS in a world where the two key elements needed to implement his vision, ubiquitous computing and the internet, did not yet exist.

Now, several decades downstream, Fuller’s prediction has come true with a twist that would probably surprise and delight him. The Internet as society’s global brain can potentially enable us to overcome many of the traps of over-specialization. Fuller predicted, far ahead of the internet that could realize his prediction, a second antidote: “Suddenly, all unrecognized as such by society, the evolutionary antibody to the extinction of humanity through specialization appeared in the form of the computer.”

Further, the concept of “design thinking” is the foundation for another inspiring resource—a book published in 2016, *Designing Your Life*, by Bill Burnett and Dave Evans, Silicon Valley innovators and Stanford University design educators. In the book’s introduction, the authors note that “aesthetics, or the way things look,” is an example of “a problem with no one right solution that designers work on.” The authors continue that “Each company works in its own way,” noting as an example that “a Ferrari has an unmistakably passionate Italian look, and a Porsche a fast, exacting German sensibility,” which is “why, in some ways, aesthetics is the ultimate design problem.” The authors conclude that “Aesthetics involves human emotion,” and they “discovered that when emotions are involved, design thinking has proved to be the best problem-solving tool.”<sup>2</sup>

## The SOA Competency Framework

A “design science” and “design thinking” resource is available for you via the SOA Competency Framework. The entry point for creating the Personal Development Plan is a simple click on the “SOA Member” link in the Octagon (see Figure 1). It will direct you first to the Self-Assessment tool, then to the Personal Development worksheet.

### Stage 1: The Self-Assessment Tool

When you begin the exercise, the “Self-Assessment Tool: Instructions” page outlines the six steps you will take:

1. Log in, or else your work will not be saved, and allow yourself 45 minutes to do the assessment, which may be divided over multiple sessions.
2. Rate each of the 100 statements according to (a) its importance to your work and (b) your ability to perform.

3. View your results.
4. Save and print your results.
5. Review and interpret your results.
6. Use the SOA Competency Framework Personal Planning Workbook to create a personal plan.

You will rate the 100 statements on the questionnaire to assess their importance to your work and your ability to perform them by clicking on the dots on a five-point scale from *Very Much So* to *Not at All*. The questionnaire begins with statements such as the following:

- Demonstrate an understanding/knowledge of the client’s environment and the issues the client is facing.
- Provide timely analysis to reach a recommendation, sometimes with incomplete data.

Figure 1  
The Competency Framework

**SOCIETY OF ACTUARIES** SELF-ASSESSMENT TOOL

**COMPETENCY FRAMEWORK**

- P** Professional Values
- EF** External Forces & Industry Knowledge
- L** Leadership
- RM** Relationship Management & Interpersonal Collaboration
- TS** Technical Skills & Analytical Problem-Solving
- SI** Strategic Insight & Integration
- RO** Results-Oriented Solutions
- C** Communication

**Design Your Future**

The SOA Competency Framework presents the general knowledge, skills and behaviors that SOA members have identified as necessary for actuaries’ success as individuals, as members of teams and as members of organizations. These competencies were generated and validated by more than 3,100 participating SOA members and are common across all areas of actuarial practice.

Which competencies are most important to you in your present work? What about your future work? Where is there room to grow? The Self-Assessment Tool will help you answer these questions.

The time required to complete the Self-Assessment Tool and review results varies by individual. It may take up to 45 minutes to complete the assessment; however, it may be completed in more than one sitting. Please be aware that the work you perform will be saved only if you are logged in. Upon completion, you will be able to view, print and download your personal results. Then you can use the results to design your personal plan and take action.

**Start to design your future now!**  
Please click here to view [system requirements](#).

SOA MEMBER    NON-SOA MEMBER    CONTINUE AS A GUEST

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Figure 2  
Self-Assessment Summary Scores

SUMMARY DETAILS USING YOUR RESULTS DOWNLOAD PLAN			
● Importance to Your Work ▲ Your Ability to Perform			
Competency Assessment			
	Importance to Your Work	Your Ability to Perform	Gap
Communication	4.80	4.70	0.10
Professional Values	5.00	5.00	0.00
External Sources & Industry Knowledge	4.90	4.20	0.70
Leadership	4.40	3.80	0.60
Relationship Management & Interpersonal Collaboration	5.00	5.00	0.00
Technical Skills & Analytical Problem Solving	4.70	3.70	1.00
Strategic Insight & Integration	4.80	4.00	0.80
Results-Oriented Solutions	5.00	4.80	0.20

- Demonstrate superior analytical skills that are combined with (but not overshadowed by) the ability to communicate technical concepts to a nontechnical audience.

When finished and viewing your results, consider each question to help identify specific dimensions of development needs/gaps for each competency.

### Stage 2: The SOA Competency Framework Personal Planning Workbook

The Personal Planning Workbook is your plan to address gaps identified in the Self-Assessment in Stage 1.

The Download worksheet provides the gaps to feed into the My Plan worksheet of the Personal Development Plan workbook. Figure 2 shows sample results from the Self-Assessment workbook, contained in the worksheet Download, with rows hidden to display the gap scores for each of the eight competencies compactly.

The following six steps in the Welcome worksheet of the Personal Development Plan workbook will help you create your Personal Planning Workbook.

- **Step 1:** Transfer the gap values from the Competency Framework Self-Assessment Tool to Column B on the worksheet “My Plan.”
- **Step 2:** Starting with the largest gap, formulate one to three objectives that will help you reduce the gap for that competency. Write these in Column C on the worksheet “My Plan.”
- **Step 3:** Continue with the remainder of the competencies. You may want to limit your plan to the three or four competencies with the largest gaps.
- **Step 4:** Write a plan that will help you meet the objectives for reducing each gap. Worksheets in this workbook list possible activities and their sources for each competency.
- **Step 5:** Enter the date you want to start each plan in Column E of the worksheet “My Plan.”
- **Step 6:** Periodically review your objectives and plans. As you complete a plan, record the date in Column F and the results in Column G of the worksheet “My Plan.”

Figure 3  
Sample Summary Worksheet

Society of Actuaries Competency Framework - Personal Planning Workbook						
My Plan - Sample						
9/2016						
Competency	Gap*	Objective	Plan	Start Date	Date Completed	Results
Communication	2.3	Improve ability to present at Division training sessions.	Listen to SOA meeting session - Getting Your Point Across to Non-Technical Audiences, SOA Meeting Session	October 1, 2016	October 1, 2016	Listened to session and viewed PowerPoint slides. Material provided good insight into how to present numbers to a non-technical audience. I need to follow the speaker's suggestions in this area. I will apply the suggestions to the presentation I am making for the underwriting.
		Improve oral presentation skills to small groups.	Join and participate in the downtown Toastmasters Club	December 1, 2016		
Professional Values	1.5					
External Forces & Industry Knowledge	0.3					
Leadership	0.4					
Relationship Management & Interpersonal Collaboration	0.1					
Technical Skills & Analytical Problem Solving	-					
Strategic Insight & Integration	0.8					
Results-Oriented Solutions	1.0					
* transfer values from SOA Competency Framework Self-Assessment Tool						
<span>Welcome</span> <span>My Plan</span> <span><b>My Plan - Sample</b></span> <span><b>Communication</b></span> <span>Professional Values</span> <span>External Forces &amp; Industry K</span> <span>Leadership</span> <span>Relationship Management &amp;</span>						

### Your Plan to Address and Prioritize Significant Gaps Identified in the Self-Assessment

The summary worksheet for your own plan will expand to three or four objectives for each of the competencies you judge to require the most attention. The worksheet for each respective competency contains useful additional sources for enhancing that competency (see Figure 3).

### Curriculum for Relationship Management and Interpersonal Collaboration

The Relationship Management and Interpersonal Collaboration competency is shown in Figure 4 as an example. For each of the eight competencies, a dedicated worksheet is provided to link to relevant meeting sessions. In turn, the entries feed into the summary worksheet that consolidates all competencies.

### SOA Meeting Sessions for 2010–2016 on Each Competency

Finally, we arrive at the ultimate granular level of learning materials, hooking into all meeting sessions from more than a half-decade of instruction by preeminent actuaries. The Personal Planning Workbook (Figure 5) contains worksheets for *all*

2010–2016 meeting sessions, with every professional development offering listed by its primary competency.

Many valuable learning resources are also available in addition to these relevant actuarial events. The various educational sections have outstanding knowledge tools in their websites, for example:

- Technology Section website, <https://www.soa.org/sections/technology/technology-landing/> and
- Technology Section Learning Center, <https://www.soa.org/sections/technology/technology-learning-center/>

You will also find tools far removed from the actuarial universe as well, such as TED Talks, Toastmasters and Dale Carnegie courses. Beyond that, look to the References links at the end of this article.

### HOW WILL THE COMPETENCY FRAMEWORK HELP ME DESIGN MY FUTURE?

Given that the Personal Development Plan Excel file can be updated any time you wish, you will have a continuously current tool to plan your career and personal development throughout your entire working life. In other words, you can design your future.

Figure 4  
Sample Curriculum for Relationship Management and Interpersonal Collaboration

Society of Actuaries Competency Framework - Personal Planning Workbook				
Relationship Management & Interpersonal Collaboration				
Creating mutually beneficial relationships and work processes toward a common goal.				
Possible Activities	Vendor	Venue	Cost	Link
Listen to relevant meeting sessions from recent SOA meetings.	Society of Actuaries	Audio recording with slides	\$	Go to the Meetings worksheet in this workbook for a list of meeting sessions by competency, select relevant sessions, and then go to the SOAweb site to purchase recordings: <a href="http://www.soa.org/Professional-Development/Archive/audio-recordings.aspx">http://www.soa.org/Professional-Development/Archive/audio-recordings.aspx</a>
View handout materials of relevant meeting sessions from recent SOA meetings.	Society of Actuaries	Slides	Free	Go to the Meetings worksheet in this workbook for a list of meeting sessions by competency, select relevant sessions, and then go to the SOA web site to view the slides: <a href="http://www.soa.org/professional-development/archive/detail.aspx">http://www.soa.org/professional-development/archive/detail.aspx</a>
Read relevant articles	Actuarial Profession	Articles	Free	<a href="http://www.soa.org/careers/career-resources/career-articles/management.aspx">http://www.soa.org/careers/career-resources/career-articles/management.aspx</a>
List is illustrative of resources that are available.			\$: < \$50 \$\$ < \$200 \$\$\$ < \$500 \$\$\$\$ > \$500	

Figure 5  
Competency Framework—Personal Planning Workbook

Society of Actuaries Competency Framework - Personal Planning Workbook						
2015 SOA Meeting Sessions						
Life & Annuity Symposium, Health Meeting, Valuation Actuary Symposium, Annual Meeting Sessions with slides or audio						
Competency	Session Title	Session Number	Meeting	Overall Session Rating	Slides	Audio
Communication	Effective Risk Reporting for Life Insurers	149 PD	2015 Annual Meeting	3.70	x	x
External Forces & Industry Knowledge	Actuaries and the International Market	55 PD	2015 Health Meeting	n.a.	x	x
External Forces & Industry Knowledge	Creating Better DC Plans, 1.50 EA Noncore	79 PD	2015 Annual Meeting	4.53	x	x
External Forces & Industry Knowledge	Small Group Medical Workshop	101 WS	2015 Health Meeting	4.52	x	
External Forces & Industry Knowledge	Late Breaking Developments for U.S. Retirement Plans, 1.50 EA Core	78 PD	2015 Annual Meeting	4.47	x	x
External Forces & Industry Knowledge	FASB/IASB Developments: Insurance Accounting	118 IF	2015 Annual Meeting	4.46		x
External Forces & Industry Knowledge	New Developments in Pension Fund Investments, 1.50 EA Noncore	180 IF	2015 Annual Meeting	4.45	x	x
External Forces & Industry Knowledge	Company Tax Update	84 PD	2015 Life & Annuity Symposium	4.44	x	x
External Forces & Industry Knowledge	Appointed Actuaries Boot Camp	54 L	2015 Valuation Actuary Symposium	4.44	x	x
External Forces & Industry Knowledge	Company Tax "Hot Topics"	185 PD	2015 Annual Meeting	4.44	x	x
External Forces & Industry Knowledge	Upcoming Developments in Annuity Valuation	39 WS	2015 Valuation Actuary Symposium	4.41	x	
External Forces & Industry Knowledge	2014 VBT/CSO Impact Study Update 1: Stat Reserves and Nonforfeiture	55 PD	2015 Life & Annuity Symposium	4.41	x	x
External Forces & Industry Knowledge	Aiming for Population Health	35 L	2015 Health Meeting	4.39	x	x
External Forces & Industry Knowledge	Latest on the ACA: From the Industry, Congress, and the Supreme Court	12 PD	2015 Health Meeting	4.37	x	x
External Forces & Industry Knowledge	Mortality Table Update on the 2014 VBT/CSO	46 PD	2015 Annual Meeting	4.36	x	x
External Forces & Industry Knowledge	Overview of IRS Directive on Tax Accounting for Variable Annuity Hedges	63 PD	2015 Valuation Actuary Symposium	4.36	x	x
External Forces & Industry Knowledge	Tax Considerations for the Life Actuary	32 PD	2015 Valuation Actuary Symposium	4.34	x	x
External Forces & Industry Knowledge	Risk Adjusters in Medicaid	88 PD	2015 Annual Meeting	4.33	x	x
External Forces & Industry Knowledge	Health Home Initiatives	64 L	2015 Health Meeting	4.33	x	x
External Forces & Industry Knowledge	Bridging the Gap between Simplified Issue and Fully Underwritten	156 PD	2015 Annual Meeting	4.31	x	x
External Forces & Industry Knowledge	Medicare Advantage Risk Score Basics	121 PD	2015 Annual Meeting	4.30	x	x

You will have the satisfaction of always making measurable progress in your continuing education effort. You will always know “What should I be doing next to advance my noble purpose, my personal inspiration, my own excellence, as an actuary?”

Looking ahead five years, you will have satisfaction in having brought into congruence your *ability* to perform each competency with its *importance* to your work and your clients’ needs.

## CONCLUSION

Your call to action is to

- Complete the Self-Assessment if you have not done so.
- Create your Personal Development Plan using the Society of Actuaries’ tool.
- Speak with your manager about your Professional Development Plan, and integrate the Competency Framework into your company’s personal performance appraisal and staff development process. You will be doing your part to accomplish on all three fronts: success as an individual, success as a team, success as an organization.

Now, after arduous travels, on, to pithy summation:

We EXHORT you, we implore you, we importune you,  
we entreat you, we adjure you, we cajole and  
conjure you . . . that is,

*We recommend, we suggest, we earnestly encourage YOU*  
to delve into the Competency Framework tool to

### **DESIGN YOUR FUTURE.**

We welcome your feedback. Our goal is to have this series address your questions and needs and to help all actuaries of the future design a future that they will find meaningful and rewarding. ■



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## ENDNOTES

- 1 Zann Gill, “Buckminster Fuller’s Great Pirates: The Origins of Specialization” (2011), Deephaven Centre for Survival Research, <http://deephaven.ca/buckminster-fullers-great-pirates-the-origins-of-specialization/> (accessed September 4, 2017).
- 2 Bill Burnett and Dave Evans, *Designing Your Life: How to Build a Well-Lived, Joyful Life* (New York: Knopf, 2016), pp. xiv–xv.

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- How to Become a Better Actuary, <http://www.soa.org/files/Soa/comp-framework-bubke.pdf>
- How Toastmasters and the Competency Framework Can Benefit Actuaries, <https://www.soa.org/files/Pd/comp-framework-worrell.pdf>
- Competency Framework concepts from other disciplines, [https://www.google.com/search?q=Competency+Framework&sourceid=ie7&rls=com.microsoft:en-US&ie=utf8&oe=utf8&rlz=117GGNI\\_enUS603&gws\\_rd=ssl](https://www.google.com/search?q=Competency+Framework&sourceid=ie7&rls=com.microsoft:en-US&ie=utf8&oe=utf8&rlz=117GGNI_enUS603&gws_rd=ssl)

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# Global Actuarial Mentorship Program: Seeking Mentors Worldwide

Actuaries Without Borders® (AWB) is seeking volunteers among qualified actuaries and academics to participate in a global remote mentorship program.

## As a mentor you will:

- Participate in the development of the actuarial profession in countries with a lack of such resources.
- Build awareness of the actuarial profession and education through one-on-one relationships.

## How it works:

- Mentors and mentees will be matched through a worldwide application process.
- Communication will take place remotely across applications of the mentee and mentor's choice. No travel required.
- Rules, guidelines and support will be provided by AWB and mentee's local actuarial association.

*Note: This program is not intended to provide free consulting service, executive coaching, personal life coaching, nor career coaching, etc. It is restricted to non-commercial use.*

## Who can apply:

- Qualified actuaries and academics. No geographical restrictions.
- Priority will be given to current AWB members. Non-members are encouraged to apply for AWB membership prior to application.

## Application:

Application forms and further details are available at the following URL:  
[http://www.actuaries.org/index.cfm?lang=EN&DSP=AWB&ACT=GLOBAL\\_MENTORSHIP](http://www.actuaries.org/index.cfm?lang=EN&DSP=AWB&ACT=GLOBAL_MENTORSHIP)

Complete the mentor application form at the above link and return to AWB ([AWB-MET@actuaries.org](mailto:AWB-MET@actuaries.org)).

If you have any questions or contacts (individuals and organizations) in developing countries who could benefit from this program, please do not hesitate to contact the AWB executive director, Renata De Leers ([awb-ed@actuaries.org](mailto:awb-ed@actuaries.org)), or the project manager, Bosco Chan ([bosco.chan@prudential.com](mailto:bosco.chan@prudential.com)).



IAA ACTUARIES WITHOUT BORDERS SECTION  
SECTION DES ACTUAIRES SANS FRONTIÈRES DE L'AAI

# An Unorthodox Guide to Actuarial Communication (Part 2)

By Dave Snell

In part 1 of this guide (Issue 40, May 2017; find it on the SOA website at <https://www.soa.org/sections/actuary-of-future/aof-newsletter/>) I confessed to having no formal academic training in writing, but a long history of writing experiences. This part of my guide is focused on how to write for English readers if you are Chinese, and how to write for Chinese readers if English is your primary language. Again, I claim no academic qualifications in either type of writing. These tips are based solely upon my experience as an editor—especially after my struggle to learn Mandarin.

First, let's address the issue of writing in English (specifically, American English). The English language contains more than half a million words and provides the ability to express nuances of meaning that are sometimes difficult to convey in other languages without a lot of extra words.

On the other hand, modern English is not a source language. It traces its roots to Latin (primarily via French), Germanic (possibly through Anglo-Saxon-Frisian) and Greek; and it also has assimilated many words and grammatical oddities from other languages over the years.

New words are being coined all the time by anyone who decides to use them in publications and tweets. The first time I heard the word *bigly* was in a speech by President Trump. This differs from French, for example, where new words generally have to be accepted first by the Académie Française. The result is that English is an amalgam of dozens of irregular verb conjugations, sometimes confusing parts of speech and counterintuitive usages. We drive on a parkway, park in a driveway and brag that a very desirable item is *cool* or even *hot*. Likewise, a new iPhone or other electronic device could be described as *sick*, meaning *really good* (or *really bad*, where *bad* is *good!*).

My impression is that English is a relatively easy language to learn to speak or write poorly, but a very difficult one to master. Fortunately for actuaries, complete mastery is not necessary, but

a few tips may help you avoid writing English so poorly that it changes your intended message or detracts the reader from understanding it.

I have been writing for a long time. Prior to my actuarial career, I was editor, publisher and owner of a weekly magazine, and later an engineer and technical writer who wrote a 3,000-page manual describing how to overhaul a military jet engine (which I no longer have the security clearance to read). I have authored or coauthored several chapters of Life Underwriter Training Council (LUTC) textbooks. When I was in the brokerage business, I was editor of the Redwood Empire Association of Life Underwriters (REALU) newsletter, which won the best in state award (California) for two consecutive years. I wrote the bulk of the boring patent wording for a process I coined involving predictive analytics and machine learning for underwriting (U.S. patent 8775218), but my preference is to write for readability.

## TIPS FOR WRITING IN ENGLISH IF CHINESE IS YOUR FIRST LANGUAGE

### Pay Special Attention to Pronouns

In English, pronouns are used a lot, and they matter a lot. This differs from Chinese, which now has separate characters for *he*, *she* and *it* (a long time ago they were the same character) but there is no separate character for *he* versus *him*, *I* versus *me*, or *she* versus *her*. Furthermore, *he*, *him*, *she*, *her* and *it* all sound exactly the same (*ta*) when spoken in Mandarin. Plus, the pronoun is usually implied in a Chinese sentence, so it often is omitted. For all these reasons, writing or speaking the wrong pronoun seems to be the most common mistake that a Chinese speaker makes in English. I won't try to establish grammar rules. You can read hundreds of good books on this already.

Back when I started studying Mandarin, I would try to practice with many friends. I would also give only Mandarin commands to one of our dogs. Once, I proudly mentioned to a Chinese friend that when I left our home, I would tell that dog 好好看家 (literally, *good, good, watch house*) and that she seemed to understand me. My friend started laughing so much that he almost fell off his seat. He told me: "A dog is not a *he* or *she*. A dog is an *it*." There was nothing wrong with my Mandarin phrase, but from his perspective I applied a nonsensical gender to my dog. Please keep this in mind when you write or speak in English. The use of *he* for a woman or *she* for a man is considered funny and nonsensical to an English reader or speaker. Likewise, other animals, such as dogs, are *it* in Mandarin, but they are *he* or *she* in English.

## Verb Conjugations are Difficult and Sometimes Nonintuitive

Mandarin is so logical regarding verbs that English grammar seems, and is, unnecessarily complicated by comparison (I'll expand on this in the section of writing for Chinese speakers). I will give the example of the verb *to be*, but most English verbs have several forms depending upon how they will be used.

Just as an example of the complexity associated with English verb conjugations, consider the verb *to be*, which can be expressed as *am*, *is*, *are*, *was*, *were*, *being* and *been* depending upon the verb tense or mode.

Further adding to the confusion, the subjunctive and indicative forms of a verb can cause it to seem in conflict with the way we normally handle a plural or singular case. If the idea being expressed is that of a wish or desire to achieve an imaginary state that has never existed and probably never will, then it is proper English to write *were* instead of *was*. I wish I were perfect at grammar, but I was never that good at it.

## English Plurals are Very Difficult: Learn Common Ones and Create Workarounds for Others

In English, we have one dog, two dogs, one cat, two cats, one deer, two deer, one mouse, two mice, one crisis, two crises, one person, two persons (but a group of people . . . or peoples if they are from many different countries), one phenomenon, two phenomena. The formation of the plural is usually, but not always, carried over from the source language for the noun involved. Mandarin is much more logical and consistent: one of dog, two of dog, one of cat, two of cat, one of mouse, two of mouse, one of crisis, two of crisis . . . you easily get the idea.<sup>1</sup>

So why would I not recommend you just memorize all the plural forms? Because they are often so confusing that your English-speaking reader will not know the correct form, and you might offend someone's sense of grammar even if you are correct!

Let's take the word *octopus*. The preferred English plural of *octopus* is not *octopi*, because unlike most words ending in *us*, *octopus* is not from the second declension Latin, so you do not change the *us* to *i* to form the plural. It is actually from the Greek, so one might think the plural would be *octopodes*. But no! The preferred plural in English is *octopuses*. This poses a dilemma for the writer who wishes to impress a manager with his or her mastery of English communication.

Assume you are describing a situation involving three octopuses. Which form should you write?

- a. I saw three octopuses in the tank (flaunting your correct English but seeming incorrect to most Americans).



- b. I saw three octopi in the tank (appealing to the majority of educated English speakers, but offending the minority that are more savvy about linguistics).
- c. I saw more than one octopus in the tank. In fact, I saw three of them. (This creative workaround offends nobody. Yet it conveys the message unambiguously.)

Clearly, most actuaries do not have to write often about octopuses, but what if you have to write a report to your management and you want to describe more than one formula? Should you write *formulas* or *formulae*? Either one is currently considered correct, but readers have definite opinions on which is preferred. My advice is to get more creative and call them equations (or algorithms).

## Be Careful With English Words That Take on Different Meanings in Different Situations

A Chinese friend of mine wanted to tell me how hard she worked at her job. She said, "I work as a dog." The immediate image this conveyed was that each morning she puts on a dog suit and perhaps stands in front of a Petco to attract customers. The words *as* and *like* are almost interchangeable. But sometimes they are not! Relating this to Mandarin, I humbly apologize for the times I have called someone's mother a horse because I applied the wrong tone to the same sound (*ma*).

These examples are merely the tip of an iceberg of errors I have encountered as native Chinese writers submit articles in English. I applaud you for your courage and merely want to help you to show your brilliant ideas more effectively.

In summary, be especially careful with pronouns, verb tenses, plurals, context (*like a dog* versus *as a dog*), articles (*a*, *an*, *the*—they do seem meaningless, but we expect them anyway) and words that take on opposite meanings (*hot*, *cool*, *good*, *bad*, *sick*). Always try to use a grammar checker and build a network of

native English-speaking friends who are willing to proofread your reports (at least until you feel confident with those reports).

### TIPS FOR WRITING IN ENGLISH IF CHINESE IS YOUR READER'S FIRST LANGUAGE

Hey! If you grew up speaking and writing English, you don't need any writing tips, right? Perhaps that is true for you, but my experience was a bit different, and I'd like to share some ideas I learned to make my English reports and recommendations more readable by Chinese managers and others for whom English is a second language.

#### Construct Your English Sentence Using an Asian Ordering Format

One of the first insights I gained about English from studying Mandarin was that English grammar is unnecessarily complicated.

Let's talk about one of our favorite actuarial topics—taking an exam. In English, I might say that I plan *to take* the exam next week, or I *took* the exam last week, or I *am taking* the exam today, or I *have taken* similar exams recently or I *will have been taking* these exams for five years as of next week.

In Mandarin, there are no verb conjugations. What?! How can they possibly express when something happens? Actually, it is pretty logical and easy:

- Next week, I take the exam (it will happen next week).
- Last week, I take the exam (it happened last week).<sup>2</sup>
- Today, I take the exam (it is happening today).
- Right now, I take the exam.

OK, but how should that affect my recommendation or report?

Knowing the Asian tendency to place the time before the action, you can make your sentence much easier to understand by clarifying, at the beginning of your sentence, when the event takes place. I truly believe that the dominant language of the future will have the richness of the English vocabulary coupled with the far more logical grammar of Chinese.

Keep your sentences relatively short, and try to respect the

Time, Subject, Action

format.

#### Avoid Less-Common English Words

When you are writing for a person whose first language is not English, it is a good practice to stick to the more-common English words rather than flaunt your more extensive vocabulary. One of the worst wordings I ever encountered on an exam

was many decades ago on a Society of Actuaries exam. It was the old demography and graduation exam, and it was part multiple choice and part essay. We had to memorize a bunch of really useless facts to pass the exam. I did very well on it.

I studied with my friend, Shau, who was a much superior student. Whenever we encountered the phrase *it can be shown* in a study note, Shau would be able to prove it. He studied everything on the syllabus and was our resident expert for any questions we might have about the material. One of the essay questions was a really tough one for us. We were asked to describe the drawbacks of an obscure method that was mentioned only in a footnote of one of the textbooks. I, and most of my friends taking that test, came out and complained that we blew it because we had no idea how to answer that question. Shau joined us in this complaint, and we all teased him that he knew everything and was just trying to agree with us to make us feel better. However, Shau was seriously upset. He told us that he didn't study enough. He knew all the advantages and disadvantages of that method, but he neglected to study the drawbacks.

My heart went out to him as I realized that the smartest student among us got zero on that question because he did not know that *drawback* was a synonym for *disadvantage*.

I confess to falling in love, at times, with the many words in English, and how they can allow us to choose just the right shade of meaning to paint a memorable picture at times. I was reading an article in *The Economist* magazine that described the National Security Agency's "hoovering up" private data about us, and I thought it so clever that they picked a verb to describe



Figure 1  
Options Screen

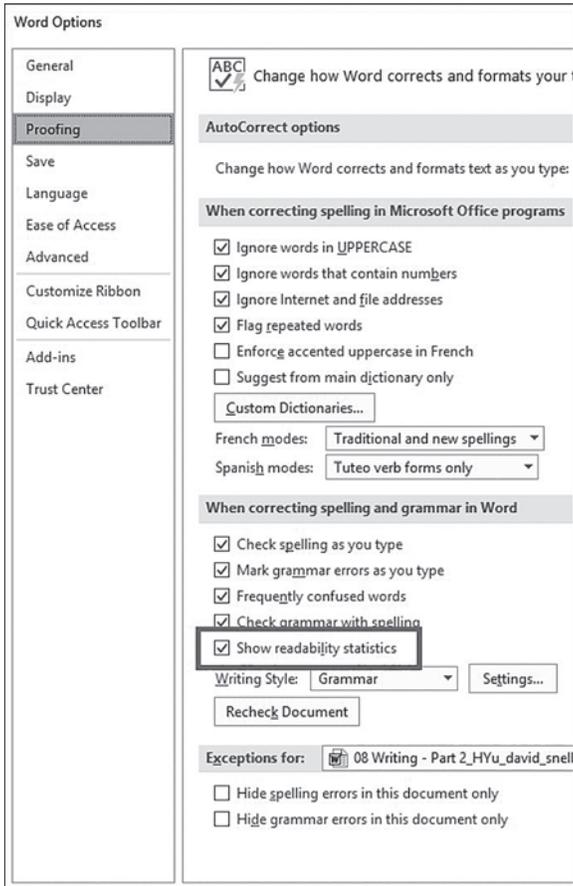


Figure 2  
Readability Statistics

Readability Statistics	
<b>Counts</b>	
Words	2,817
Characters	13,471
Paragraphs	62
Sentences	149
<b>Averages</b>	
Sentences per Paragraph	2.8
Words per Sentence	18.4
Characters per Word	4.5
<b>Readability</b>	
Flesch Reading Ease	61.8
Flesch-Kincaid Grade Level	8.5
Passive Sentences	13.4%

both a vacuum cleaner (the Hoover brand) and the first head of the FBI (J. Edgar Hoover) for this clandestine operation to suck up our personal information.

However, in a business environment, if you are writing for a primarily Asian (or any non-English) reader, please focus on clarity of communication. Save your favorite Norse mythology or baseball analogy for a different audience. Even early cartoon references or nursery rhymes can be confusing if the person did not grow up seeing those cartoons or reading those children’s books.

One very handy tool you can use to check the readability of your document exists in Microsoft Word, but it is not shown by default. You can add it for free via File, Options (see Figure 1), Proofing, Show Readability Statistics (see Figure 2). Then, when you check your document for Spelling & Grammar (from the Review tab in Word), you will automatically get a summary of various readability metrics. This can be a good practice even when intended readers are native English speakers.

Quickly summarizing this section, try to:

- Keep your sentences reasonably short.
- Avoid unusual words or phrases if they are not needed.
- Use time indicators up front to clarify verb forms.
- Check your work for readability.

In retrospect, these are good ideas when you are writing for other native-English speakers as well.

Thank you very much for the feedback I received from Part 1 of this guide. If you enjoyed Part 2 as well, or if you have specific types of items you would like to see in a Part 3, please let me know. Also, special thanks to Haofeng Yu, who proofread Part 2 for me from a Chinese perspective. ■



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**ENDNOTES**

- 1 In fairness, Chinese uses measure words that complicate plurals a bit because the character for *of* dogs differs from the character for *of* fish and so on, but these are based on some logic (e.g., a fish is long and flexible like a belt so they have the same measure word). Even here though, English is much more confusing, and most native speakers do not know to write about a pod of whales, a pack of dogs, a dazzle of zebras, a parliament of owls, a murder of crows, a crash of rhinoceroses, a trumpet of unicorns, etc.
- 2 I oversimplified here. In Mandarin, the participle *-le* is usually added to a verb when the action is already completed. This clarifies whether I am planning to take the exam today or I actually took it today.

# SOA Explorer Tool

Find Actuaries Around  
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The SOA Explorer Tool is a global map showing locations of fellow SOA members and their employers, as well as actuarial universities and clubs.

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