Workforce Trends in Data Analytics

Kristi Donovan, CAE

Senior Consultant McKinley Advisors





© 2021 by the Casualty Actuarial Society. All rights reserved.



Workforce Trends in Data Analytics

Kristi Donovan, CAE Senior Consultant, McKinley Advisors

Introduction

With the rapid proliferation of data in both form and quantity, actuaries and other insurance data professionals are faced with increasing opportunities for data analysis that could make a real impact. To ensure that current and future CAS members are well-positioned for professional growth and opportunities, the CAS undertook comprehensive research to explore how the needs for data analytics skills are changing and will continue to change in the future.

Informed by the practices of some of the largest companies leveraging data analytics today, this paper outlines the challenges that continue to emerge within the insurance industry and provides a deeper understanding of the suite of skills that are needed as the industry continues to transform. The paper also discusses the impact of the convergence of these factors on hiring within the insurance industry – particularly as they apply to the essential skills and competencies needed by actuaries and other insurance data professionals.



Emerging and Ongoing Challenges for Data Analytics in Insurance

The CAS interviewed insurance industry executives to understand the current challenges they are facing with the use of data and data analytics, and the impact of those challenges on the business and, specifically, the actuarial profession.

Proliferation of data: The rapid expansion of available data offers increasing capacity for the use of artificial intelligence (AI) and predictive analytics. Companies are searching for opportunities to expand and enhance the insights they derive from data and need professionals who are knowledgeable about the changing analytical tools and creative in understanding how this data can be used.

Competition from non-traditional competitors: The proliferation of data and expanded access to it foster an environment that permits new entrants into the marketplace. As evidenced by recent entrants like Tesla, which is offering a new insurance product, and enhanced new data sources such as aerial imagery and telematics, data collected by all types of companies inform the development of new business concepts that might have been previously considered outside the business mission.

Shift to cloud-based platforms:

Many companies are still trying to understand how the cloud can be leveraged in the actuarial space, particularly as it relates to analytics, as cloud services could have an impact on workflow, data and staffing. Particularly relevant is the need for actuaries to understand how to take advantage of data stored within the cloud, and the capacity for accelerated analysis offered by the cloud.

Intensified customer-centric

approach: Insurance companies are facing new and individualized consumer expectations, shaped by changes in commerce across society. As the industry struggles to adapt to these demands. Industry leaders cite the need for heightened awareness of the efficiencies demanded by customers that can also create value for the company. Increased reliance on artificial intelligence and machine learning: Advances in AI and machine learning are fostering the development of more complicated models, which creates a multitude of challenges. Companies are rapidly expanding training around these technologies, which also creates ethical concerns as the profession wrestles with new levels of sophistication and regulations that are routinely playing catch-up to the technologies.

Safeguards for innovation: The proliferation of data, shift to the cloud, and advances in AI and machine learning point to a rapidly accelerating advancement of technology, beyond the pace of regulators' ability to evaluate these new processes. With their adherence to high standards of conduct, practice, and qualifications, actuaries can play a role in establishing ethical approaches to these new technologies ahead of scrutiny by regulators, to ensure that innovation is preserved.

Evolution of Data and Analytics in Businesses Outside of Insurance

CAS engaged data analytics and data science professionals in senior executive roles outside of the insurance industry to better understand the evolution of data and analytics as a professional field, including future directions. Experts interviewed included individuals at companies such as Amazon, Facebook, and Nielsen. These individuals identified a series of challenges and opportunities in the field, to which the actuarial profession must be attuned in order for the profession to develop and advance.





- Need to identify relevant trends to anticipate consumer needs
- Increase in the development of specialized education in data science
- Expanded availability of online education programs in data science
- Increased need for clean data
- Databases are more oriented to big data
- Increased need for strong communication skills
- Integration of data analytics with other departments
- Growing need to integrate newly
 available types of data



Hiring for Data Analytics: Critical Skills and Competencies for Insurance

As we explored the state of the current workforce in insurance, it became clear that a lack of consistent definitions exists for the skillsets of individuals that define themselves as data scientists or data analysts. In addition, there is a lack of clarity around the how to effectively leverage data analytics to meet business needs. Complicating this is the fact that demand for this work often outstrips supply, and that skills like intellectual curiosity and soft skills exemplified through communication, leadership and emotional intelligence are prized but not prevalent.

Finding Talent

Understanding Business Needs

Insurance industry executives report that outside of major metropolitan technology hubs like San Francisco, Seattle and New York analytical talent is sparse and difficult to identify. First and foremost, the industry struggles with defining its needs, particularly as they relate to the descriptions of data scientists and data analysts. The inconsistency in the meanings behind these titles, both within insurance and the broader technology space, makes it challenging to identify both internal position requirements as well as qualified candidates. Further, the diverse array of academic credentials available in the market underscores these challenges as employers struggle to understand the differences in competencies acquired through credentialing, certificate, and degree programs. Not only does this present a challenge for hiring, but it also creates challenges for employers in determining the best approach to training current employees in critical technologies.

Employers also shared that they are weighing the benefits of knowledge of insurance versus knowledge of data analytics during the hiring process. Many reported that a balance of the two is important, and that where data analysis needs to prevail, they feel confident that it is easier to teach the business of insurance. Conversely, they emphasize the relevance of understanding the insurance industry and relevant business models, including which models are appropriate for different problems, as critical to the success of data analysts and data scientists. That understanding and ability to adapt to the insurance business can be evident through soft skills, which appear to be taught in more comprehensive degree programs but are also often acquired and strengthened through professional experience. Companies are seeking actuaries with data analysis skills who can translate complex models and concepts to non-actuarial audiences. The value of these skills appears to be growing as the prevalence of data science roles expands throughout the industry. Notably, many of the research participants cited these skills as extremely valuable.



4



Essential Skills

Executives across the technology industries identified the following skills as critical for data analytics candidates. Pursuing and mastering these skills and competencies may also be important for actuaries as they expand their skill sets. Of particular importance, these executives noted that they highly value a strong academic background as a foundation.

- Degree or certificate that displays mathematical aptitude
- · Job experience in data and analytics (mid to senior level candidate)
- Proficiency in one or more of the major statistical packages (Python, R, SAS, Sequel, Tableau, Google Studio)
- Ability to pull and clean data from any of the big data systems
- Ability to build models from raw data
- Strong data visualization and text analytics skills

Additionally, while technical skills are easily communicated on a resume, these executives stressed the importance of clear evidence of the following soft skills or non-technical skills that reflect interpersonal attributes needed for success in the workplace.

- Strong communication and translation skills to tell a clear story around the data
- Ability to apply logic to solve a problem
- Proactive approach to identifying and solving business problems with data (intellectual curiosity)
- Ability to move from a tactical observation to a strategic observation
- Business or industry knowledge

Workforce Trends



Future of Learning Data Analytics

The executives were asked to reflect on the types of content and competencies that would be critical for individuals to advance in their careers in the next 3-5 years. The following content will be important for actuaries to consider as they look to expand data analysis skills.

- **Business literacy:** Employers are seeking the ability to transform data from insight to solutions and communicate that process to non-technical colleagues.
- Leveraging unstructured data: The ability to integrate the rapid advancement of new types of data that are available into useful metrics will be crucial for business success.
- **Cloud:** The use of the cloud is expected to expand, and employees will need to be comfortable in leveraging this power.
- **Continuous learning:** The proliferation and new types of data, expansion of the techniques and models of data analysis, and other changes will require individuals to continuously evaluate their skill currency for gaps in knowledge, and their intellectual curiosity to adapt to the changing environment.
- **Ethics:** Throughout the continuum of skills development and evolution of data analytics, attention will need to be paid to the role of ethics to ensure the preservation of confidence in the industry.

The executives also identified the following critical competencies for actuaries as they integrate data analytics functions into their professional roles.

- Companies have increasingly more data available to them in an increasing number of formats. Prospective future actuaries must develop competency in converting data sets from disparate sources into usable data that can be fed into an appropriate model to make predictions.
- Employers noted an existing gap in the ability of professionals to prepare data for analysis. Data cleansing and warehousing were identified as key foundational skills that are valued in data analysts and scientists.
- The ability to translate complicated models and algorithms to other business executives is critical for professional advancement, thus **prospective future** actuaries must be able to communicate their work simply and effectively, including via data visualization techniques.

As the CAS continues to evolve its continuing education to support its members, we believe it is important to share this knowledge with you as you seek opportunities to grow and advance in your career.



6