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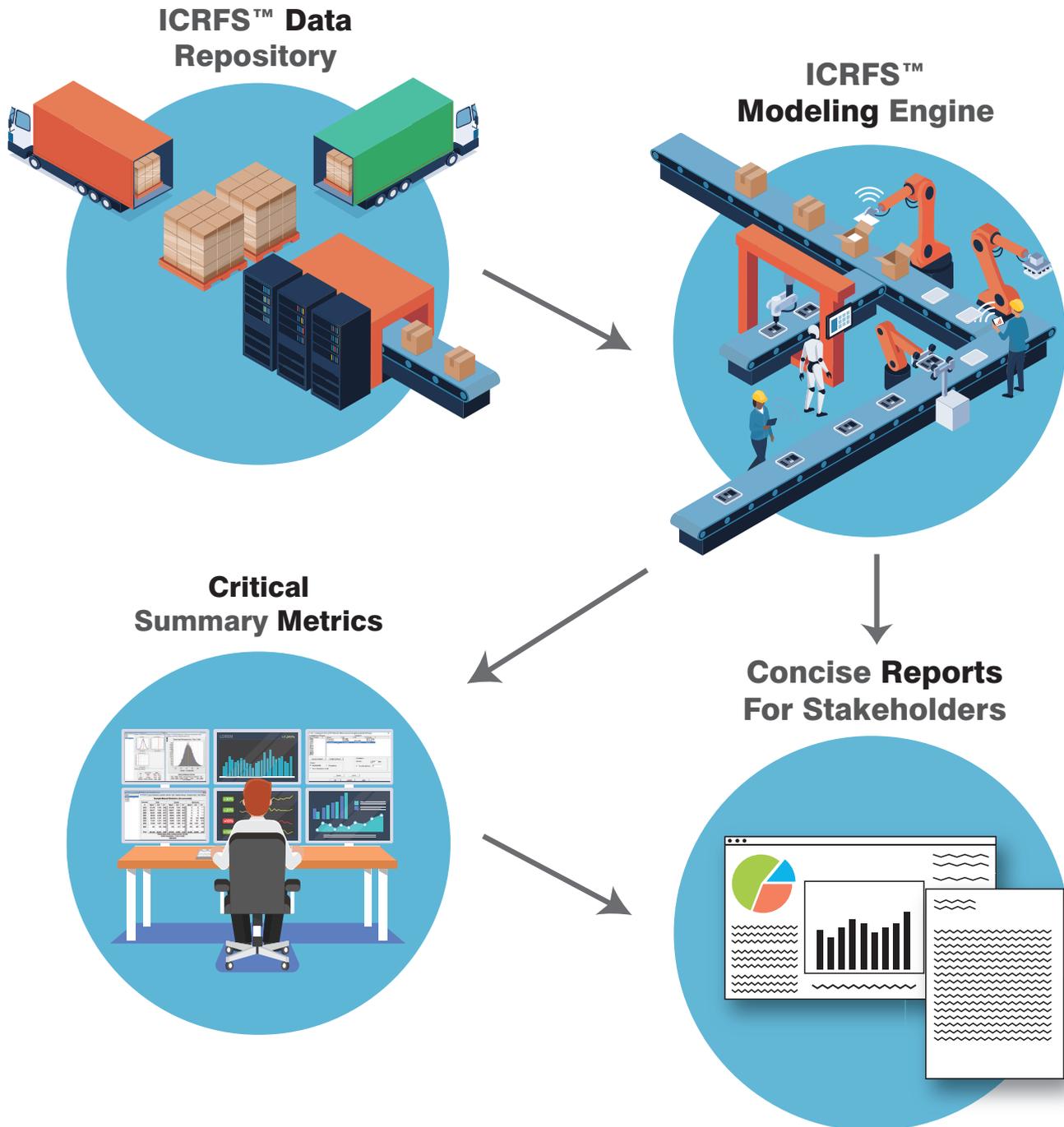


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TABLE OF CONTENTS

- 4 Process Mining
Can Smooth the
Road of Business**
BY JAMES P. LYNCH, FCAS
- 6 Insurers Explore
New Frontiers
in Claim
Management**
BY KATEY WALKER, FCAS
- 8 The Internet
of Things and
Insurance:
Seizing the
Opportunity**
BY JOHN BEAL

Process Mining Can Smooth the Road of Business

BY JAMES P. LYNCH

Imagine sitting at 10,000 feet and watching cars pour out from a busy downtown at the evening rush hour. Thousands of tiny cars course down interstates and channel off, seemingly at random, into surface arterial streets until they branch off onto secondary streets, then tinier streets still, then home.

If you can picture that, then it is easy to imagine what the demonstration of process mining looked like when Aarynn Crawley of KPMG showed it to actuaries at the March 2019 CAS Ratemaking, Product and Modeling Seminar in Boston.

Process mining is the visualization of a business activity. It is a cutting-edge way to make those activities more efficient because, like cars heading home at rush hour, any business process is subject to bottlenecks and traffic jams. Finding those impediments is the first step in eliminating them, and process mining promises to do just that.

Process mining is also a good example of how quantitative experts like actuaries can contribute to making business run more smoothly.

The idea of efficient business operations is hardly new. In the early 1900s, Frederick Winslow Taylor became the father

of scientific management by observing, then streamlining the way factory workers did their jobs.

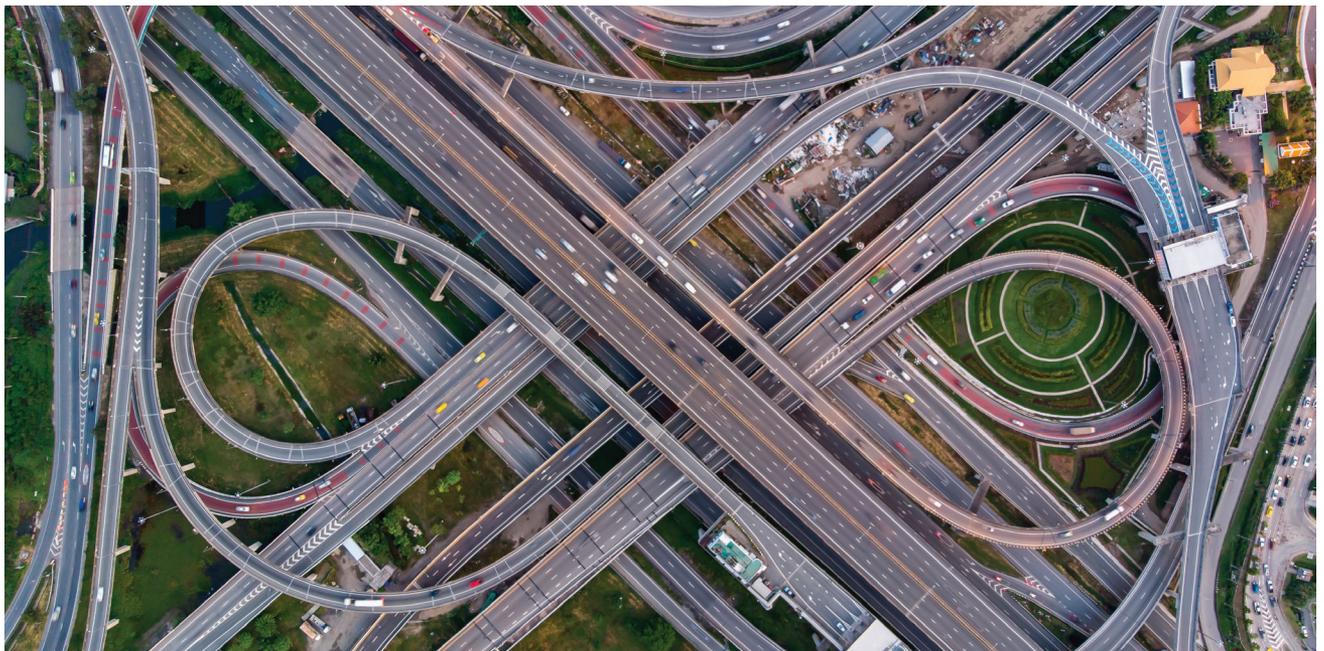
Taylor's observe-then-improve model worked well for decades. These days, unleashing a team of observers to shadow employees could be disruptive, says Jonathon Wong, a director at KPMG, who spoke to about 30 actuaries attending the session, "Profit Mining in P&C Insurance." It could also be inaccurate, he says. "People tend to be biased toward one way a process is adjudicated," Wong says.

Data collection began to improve around 20 years ago, when billing and content management systems began to time-stamp when people did various tasks and how long those tasks took. At the same time, computers became more powerful, which paved the way for models that could put the data to work.

"This is an objective — to get to what is actually happening on the ground," Wong says.

Early attempts occurred in the same manufacturing realm where efficiency experts had invented their craft. A factory floor is a relatively simple process, Wong says. "The machine can't go off script," he says. Financial service pro-

The first attempt to map a process doesn't result in a nice, neat, street-like grid. It looks hopelessly tangled, like a plate of spaghetti.



cesses, like settling property-casualty claims, however, are far more complex.

The first step is collecting data and keeping the key bits of it, says Tony Beirne, an FCAS with KPMG. The important data fields — a unique identifier, action names, start times, action costs and action executor — are present in most systems.

There are a lot of ways to solve one problem, but the first attempt to map a process doesn't result in a nice, neat, street-like grid. It looks hopelessly tangled, like a plate of spaghetti.

Analysts generally find the five or 10 most common variants and focus on them, Beirne says. For example, a simple auto physical damage variant would be:

- Open claim.
- Get inspection.
- Write check for repairs.
- Close claim.

If the policyholder has rental replacement coverage, a simple variant emerges:

- Open claim.
- Get inspection.
- Open rental.
- Close rental.
- Write check for repairs.
- Close claim.

Analysts construct their streetscape from the most common variants, then unleash a visualization routine. The visualization shows how each event flows through the system. Inevitably, it finds bottlenecks.

They also develop a cost model, where the total cost

equals time per activity times resource cost per hour times activity count. In solving problems, companies can balance time versus money. Analysts also put together dashboards to let management monitor a process in real time, to see if new bottlenecks emerge.

There is also a “happy path” that shows the ideal way for the process to unfold. Looking at the gaps between the actual path and the happy path, a new variant is developed, then tested with the visualization software. Testing lets management make sure its new method won't “torpedo your business processes,” Wong says.

Beirne says that the process works best in high-volume work areas, like basic insurance claims or policy processing. Actuarial processes could be analyzed, he says, but an actuarial unit might handle, for instance, 40 reviews in a year versus 40,000, claims — meaning an analysis of actuaries might not save as much time or money.

Process mining “takes the analyst to the front line” of a business, even though it is not the usual endeavor for actuaries, Beirne notes. “It is not going to generate coefficients,” he says, “but it will help you think through what is happening.”



James P. Lynch, FCAS, is chief actuary and director of research for the Insurance Information Institute. He serves on the CAS Board of Directors.



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Insurers Explore New Frontiers in Claim Management

BY KATEY WALKER, FCAS, MAAA, CSPA

Emerging data sources and advanced analytics provide a universe full of promise for insurers — if they can navigate it effectively.

Advanced analytics has the potential to transform an insurance company’s operations. Many insurers have made considerable efforts to leverage analytics to create better segmentation and more accurate premium calculations but are now changing the focus to the other side of the loss ratio: how to identify, manage and mitigate losses. In the recent Willis Towers Watson survey of the U.S. property-casualty industry, insurers emphasized claim management as a high-impact area for analytics applications within the next two years. The investment in claim analytics is not limited to personal lines but includes commercial LOBs such as workers’ compensation, commercial auto, general liability, business owners and medical malpractice. Detecting potential fraud ranks among the top use cases for analytics in claims (Figure 1).

Figure 1. How advanced analytics will transform claim management

	Now	Two Years
Evaluation of claims for fraud potential	26%	82%
Claim triage (identify complex claims to triage workflow)	26%	80%
Evaluation of claims for litigation potential	15%	74%
Evaluation of claims for subrogation potential	13%	62%

Reducing insurance fraud

At a cost of more than \$30 billion annually, insurance fraud is the second costliest white-collar crime in the U.S., according to the National Insurance Crime Bureau. The Association of Certified Fraud Examiners Inc. notes that internal fraud alone costs the typical organization 5% of annual revenue. Fraud identification is challenging, as claim handling can be complex and involve multiple third parties, introducing opportunities for disparate fraud schemes. Also, the volume and speed of transactions limit a company’s ability to monitor and identify potential fraud. Impactful uses of data, including predictive modeling and business intelligence, are essential tools to help adjusters uncover sophisticated and complex fraud schemes.

Data analytics can be used for more than just fraud; applications include appropriate adjuster assignment, subrogation, litigation management, settlement evaluation, loss reserving, fast-track identification, and claim service strategies and prioritization.

Workers’ compensation

The Willis Towers Watson industry survey notes that in commercial lines, claim analytics usage is highest in workers’ comp (27%) and is expected to grow to 65% in two years as more companies invest in claim triage, severity propensity and fraud identification modeling.

Workers’ comp is conducive to claim analytics applications. It has a longer claim duration than other commercial lines, with many claims remaining open years after they were first reported. Additionally, workers’ comp claims often have extensive data for the adjuster to consider (e.g., medical reports, interviews, diagnostic/procedure codes, litigation status and injured worker demographics), since they frequently involve a serious injury and may coexist with sensitive employer-employee dynamics. As a result, there is an opportunity for analytics to be used to help adjusters recognize which claims may become complex and how severe those claims are likely to be.

Guiding principles

Each company’s journey will be different, but our experience has continually reinforced four guiding principles to advance claim operations:

1. **Data first.** New analytical methods, including AI and machine learning, are justifiably getting a lot of attention, but quality experience data, predictors and customer response information will outperform new methods. Companies can also improve their models by augmenting their data with third-party information.
2. **The endgame is implementation.** Once the analytics is done, the product is only valuable when the business can understand, implement and monitor it. Otherwise, the work done is simply a technical modeling exercise.
3. **Stay on top of tech.** Legacy systems and networks make it increasingly difficult to extract the full benefits of big data and advanced analytics. New technologies that enhance analytical capability and system connectivity, including those offered by new insurtech companies, will have a greater role to play.
4. **Build a dedicated fraud management team.** It’s important to deploy specific resources to prevent fraud internally and externally. 🚀

Katey Walker is a senior director in Willis Towers Watson’s Insurance Consulting and Technology business.



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The Internet of Things and Insurance: Seizing the Opportunity

BY JOHN BEAL

Insurers long ago mastered the ability to draw insights from large data sets. But the amount of available data is exploding, largely thanks to the Internet of Things (IoT) — or the network of connected devices that exchange information over the internet via embedded sensors.

While other industries are actively capitalizing on these new data sources to drive innovation and enhance customer value, the insurance industry has lagged behind. LexisNexis released results of a study that explored the industry’s readiness for the IoT data influx. Findings show that carriers seem to be knocking at the door of the new big data era. It’s time to step forward to seize the opportunity at hand.

IoT and the State of the Insurance Industry Study

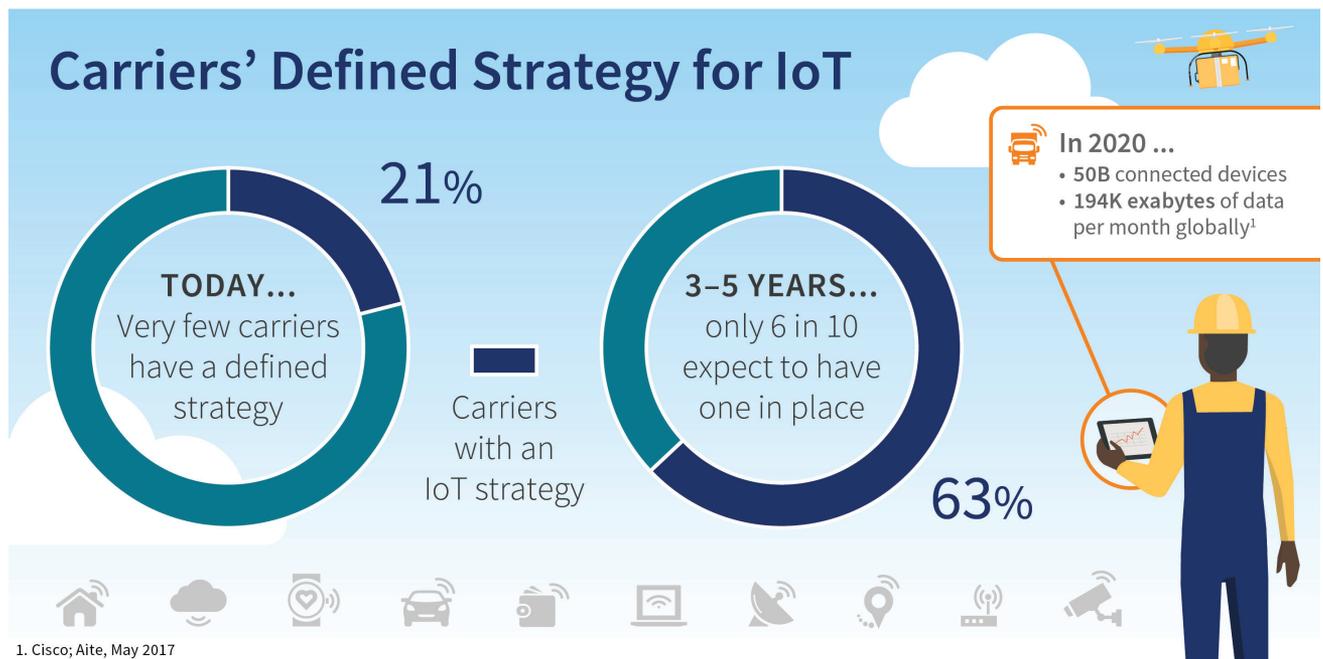
In late 2017, LexisNexis commissioned its “IoT and the State of the Insurance Industry Study” to determine the extent to which carriers are ready to collect, analyze and gain insights from the anticipated massive amounts of IoT data.

The national survey was conducted by an independent research firm and included nearly 500 professionals from the top 100 U.S. carriers from auto, home, life and commercial lines of insurance. Respondents worked in marketing, underwriting, product management and claims. The study unveiled that:

- Few carriers (just two in 10) are currently collecting data from telematics, connected homes, connected properties and wearable devices. Even fewer — just 5% — are analyzing the data they are collecting.
- Similarly, a large majority of carriers (79%) do not have a defined IoT strategy or dedicated IoT resources (93%) in place today, but 70% believe having a strategy is important.
- This changes in the next three to five years, with 63% indicating they have a longer-term strategy, and 36% anticipating their company will add dedicated resources specifically tailored to the IoT.
- While relatively little is being done today, about half of carriers (48%) believe that the IoT will define the industry leaders and the carriers that are collecting and gaining insights from IoT data (50%) will be at a competitive advantage.

The urgency for the insurance industry

Respondents are still treading cautiously when it comes to using IoT data in decision-making, even though about six in 10 indicated they believe that other carriers are doing so. This suggests that many are taking a wait-and-see approach and will likely use existing in-house systems until the return



on investment from IoT is proven. Despite the apparent desire among carriers to be deliberate, external factors are driving the need for greater urgency.

For one thing, connected devices have the propensity to alter the very nature of risk. Imagine a world where risk can be assessed in near real-time. This could have major implications for policy underwriting, with more data translating to more precise and robust information about a policy holder. It could also impact the way that claims are handled, with opportunities to mitigate or even prevent claims before they occur through more active loss prevention information gleaned from machine sensors.

Additionally, more data sources are driving new business opportunities for insurers. Increased data about a consumer can promote more relevant and tailored product offerings and personalized customer interactions. In addition, instantaneous data access promotes a shift from reactive to proactive services (think storm alerts), and different types of business models.

Finally, in addition to product development considerations for prioritizing an IoT strategy, carriers also face the risk of being upstaged by competitors from outside of the insurance industry that have direct access to their customers' data.

The need for expertise

Although a portion of the LexisNexis research asked about carriers' strategies related to data collection, the study additionally explored some of the perceived barriers that are prohibiting progress. Approximately four in ten (42%) respondents agreed that it's difficult to foresee how to store, track, analyze, and make sense of the data. Another 43% indicated that security will be a major challenge. With infinitely more structured and unstructured information about policyholders, carriers will need expanded capabilities and technology to cleanse, normalize and synthesize the data. They'll additionally need the expertise to apply machine learning, AI or other methods of predictive modeling that are ideal for processing vast volumes of information quickly and precisely.

Insurers must also have a clearly defined data privacy

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where risk can be assessed in
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policy that outlines the scope of data they plan to collect, and how they plan to use it. It is important to begin with an understanding of the business problem to solve, identify the specific types of data that will help solve it and leverage analytics to understand which data is important to keep. In doing so, insurers can minimize the volume of data coming into their organization and mitigate against excessive data collection.

A level playing field

While the study did not reveal any true segmentation by line of business or job function, there was a very small group of respondents that were slightly ahead of the others when

it comes to IoT readiness and active planning. LexisNexis labeled this group "Trend Spotters," and they place "very high" importance on having a three- to five-year IoT business strategy. Otherwise, there were no other factors to rank or distinguish between segments. The lack of differentiation underscores the point that the insurance industry does not yet have any clear leaders that are leveraging IoT data for more informed decision-making — which means the door is wide open for any forward-thinking carrier to move ahead.

Conclusion

The unprecedented amounts of data from IoT and its connected devices will put real-time insights in the hands of insurers, creating the potential to fully disrupt the industry with a redefined take on risk. The opportunities are many: more proactive underwriting and claim resolution, personalized product offerings and services, and new business models. With no one too far ahead of the curve, the time is now for all carriers to capture these and other opportunities and help shape the industry's future.

Download the entire "IoT and the State of the Insurance Industry Study" at www.risk.lexisnexis.com/IoTwhitepaper. 

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