MACHINE LEARNING IN INSURANCE

Enabling insurers to become AI-driven enterprises powered by automated machine learning
• DATA JOURNEY SO FAR

• KEY FACTORS DRIVING MACHINE LEARNING IN INSURANCE

• UNLOCKING THE POWER OF DATA

• POTENTIAL FOR MACHINE LEARNING IN INSURANCE VALUE CHAIN
  o Insurance advice
  o Claims processing
  o Fraud prevention
  o Risk management
  o Other applications

• CHALLENGES IN IMPLEMENTING MACHINE LEARNING

• PROVIDING A STEPPING-STONE TO CHANGE

• ACCENTURE VIEWPOINT
Data has always played a central role in the insurance industry, and today, insurance carriers have access to more of it than ever before. We have created more data in the past two years than the human race has ever created. Insurers—like organisations in most industries—are overwhelmed by the explosion in data from a host of sources, including telematics, online and social media activity, voice analytics, connected sensors and wearable devices. They need machines to process this information and unearth analytical insights. But most insurers are struggling to maximise the benefits of machine learning.

This situation is seeing a gradual but steady change, driven by an environment characterised by increased competition, elastic marketplaces, complex claims and fraud behaviour, higher customer expectations and tighter regulation. Insurers are being forced to explore ways to use predictive modelling and machine learning to maintain their competitive edge, boost business operations and enhance customer satisfaction.

They are also examining how they can take advantage of recent advances in artificial intelligence (AI) and machine learning to solve business challenges across the insurance value chain. These include underwriting and loss prevention, product pricing, claims handling, fraud detection, sales and customer experience.
AI and advanced machine learning are among the top 10 strategic technology trends leading organisations are currently using to reinvent their business for a digital age.

The key market forces driving the adoption of AI and advanced machine learning in 2018 and beyond are:

1. **Smart everything** – Enterprises are looking to use advanced machine learning to drive smart, automated applications in fields such as healthcare diagnosis, predictive maintenance, customer service, automated data centres, self-driving cars and smart homes.

2. **Open source everywhere** – As data becomes omnipresent, open source protocols will emerge to ensure data is shared and used across. Different public and private entities will come together to create ecosystems for sharing data on multiple use cases under a common regulatory and cybersecurity framework.

3. **Harnessing Internet of things (IoT) data** – The volume and velocity of data from IoT will drive the need to automate the generation of actionable insight using advanced machine learning tools. According to Gartner, by 2020, 20 percent of enterprises will employ dedicated people to monitor and guide machine learning (such as neural networks). The notion of training rather than programming systems will become increasingly important.

4. **Ability to talk back** – Natural-language processing algorithms are continuously advancing. AI is becoming proficient at understanding spoken language and at facial recognition, helping to make it more useful and intuitive. These algorithms are evolving in unexpected ways, as Google found when Google Translate invented its own language to help it translate more effectively.
Figure 1 illustrates the growth of the AI/machine learning market in different geographical regions over 10 years. It shows the accelerating adoption of AI and the critical importance of this technology trend.

**Global AI market, by geography**

**2017–2024 (in US$ M)**
Most insurance companies process only 10–15 percent of the data they have access to—most of which is structured data they house in traditional databases. That means they are not only failing to unlock value from their structured data, but also overlooking the valuable insights hidden in their unstructured data.

Analysing this unstructured data and using it to drive better business decisions requires advanced data science techniques. Emerging data analytics technologies centred on machine learning bring order and purpose to this unstructured data so that it can be more effectively mined for business insights.

One major benefit of machine learning is that it can be effectively applied across structured, semi-structured or unstructured datasets. It can be used right across the value chain to understand risk, claims and customer behaviour, with higher predictive accuracy.

The potential applications of machine learning in insurance are numerous: from understanding risk appetite and premium leakage, to expense management, subrogation, litigation and fraud identification.
POTENTIAL FOR MACHINE LEARNING IN INSURANCE VALUE CHAIN

Machine learning is extensively used across the insurance value chain.

<table>
<thead>
<tr>
<th>PROPERTY/CASUALTY</th>
<th>LIFE/ANNUITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Business/Underwriting</td>
<td>56%</td>
</tr>
<tr>
<td>Claims</td>
<td>40%</td>
</tr>
<tr>
<td>Product Development</td>
<td>36%</td>
</tr>
<tr>
<td>Policy Servicing</td>
<td>32%</td>
</tr>
<tr>
<td>Distribution</td>
<td>32%</td>
</tr>
<tr>
<td>Customer Experience</td>
<td>32%</td>
</tr>
</tbody>
</table>

SMA Research, 2016 Innovation and Emerging Technologies, n=84

Figure 2: Insurance business areas where machine learning can be leveraged

Some of the potential use cases are as follows:

INSURANCE ADVICE

Machines will play a significant role in customer service, from managing the initial interaction to determining which cover a customer requires. According to a recent survey, a majority of consumers are happy to receive such computer-generated insurance advice. Consumers are seeking personalised solutions—made possible by machine learning algorithms that review their profiles and recommend tailor-made products. At the front end, insurers are making wider use of chatbots on messaging apps to resolve claims queries and answer simple questions.
One such example is that of Allstate, which partnered with EIS (Earley Information Science) to develop a virtual assistant, called ABle (the Allstate Business Insurance Expert). ABle assists Allstate agents seeking information on Allstate Business Insurance (ABI) commercial insurance products. Before ABle was deployed, agents were accustomed to selling personal lines products such as health or homeowners insurance. However, when the company decided to shift its focus to selling commercial insurance, many agents had a slow learning curve and encountered challenges in accessing the information they needed to effectively communicate with potential clients. As a result, Allstate’s sales support call centre was consistently flooded with inquiries from agents. Ultimately, “long wait times” translated to “lost business opportunities.” ABle provides agents with step-by-step guidance on “quoting and issuing ABI products,” using natural language. EIS claims that ABle processes 25,000 inquiries per month.

CLAIMS PROCESSING

Insurers are using machine learning to improve operational efficiency, from claims registration to claims settlement. Many carriers have already started to automate their claims processes, thereby enhancing the customer experience while reducing the claims settlement time. Machine learning and predictive models can also equip insurers with a better understanding of claims costs. These insights can help a carrier save millions of dollars in claim costs through proactive management, fast settlement, targeted investigations and better case management. Insurers can also be more confident about how much funding they allocate to claim reserves.

Tokio Marine has an AI-assisted claim document recognition system that helps to handle handwritten claims notice documents using a cloud-based AI optical character recognition (OCR) service. It reduces 50 percent of the document input load as well as complies with privacy regulations. AI is used to read complicated, ambiguous Chinese characters (Kanji), and the “packet-like” data transfer system protects customer privacy. The results: over 90 percent recognition rate, 50 percent reduction in input time, 80 percent reduction in human error, and faster and hassle-free claims payments.

FRAUD PREVENTION

Insurance companies lose an estimated US$30 billion a year to fraudulent claims. Machine learning helps them identify potential fraudulent claims faster and more accurately, and flag them for investigation. Machine learning algorithms are superior to traditional predictive models for this application because they can tap into unstructured and semi-structured data such as claims notes and documents as well as structured data, to identify potential fraud.
Chola MS, one of India’s fastest-growing insurance companies, has adopted mobile technology for its claims survey process. The company’s vehicle surveyor application uses the voice, camera and data connectivity capabilities of the Samsung Galaxy Tablet to capture and store auto survey data in one database. In the past, loss adjusters had to manually match survey notes with e-mail and photos saved in other databases before making a decision on a claim. This initiative helped to speed up the claims settlement process, increased surveyor productivity and improved fraud prevention.

RISK MANAGEMENT

Insurers use machine learning to predict premiums and losses for their policies. Detecting risks early in the process enables insurers to make better use of underwriters’ time and gives them a huge competitive advantage.

Progressive Insurance is reportedly leveraging machine learning algorithms for predictive analytics based on data collected from client drivers. The car insurer claims that its telematics (integration of telecommunications and IT to operate remote devices over a network) mobile app, Snapshot, has collected 14 billion miles of driving data. To encourage the use of Snapshot, Progressive offers “most drivers” an auto insurance discount averaging US$130 after six months of use.

OTHER APPLICATIONS

These are just some examples of potential use cases. Insurers are also seeing significant benefits from using machine learning across functions such as direct marketing, audits, claims prediction and customer retention.
Most insurers recognise the value of machine learning in driving better decision-making and streamlining business processes. Research for the Accenture Technology Vision 2018 shows that more than 90 percent of insurers are using, plan to use or considering using machine learning or AI in the claims or underwriting process.

CHALLENGES IN IMPLEMENTING MACHINE LEARNING
Some of the challenges insurers typically encounter when adopting machine learning are:

1. **Training requirements**
   AI-powered intellectual systems must be trained in a domain, e.g., claims or billing for an insurer. This requires a separate training system, which insurers find hard to provide for training the AI model. Models need to be trained with huge volumes of documents/transactions to cover all possible scenarios.

2. **Right data source**
   The quality of data used to train predictive models is equally important as the quantity, in the case of machine learning. The datasets need to be representative and balanced so that they can give a better picture and avoid bias. This is important to train predictive models. Generally, insurers struggle to provide relevant data for training AI models.

3. **Difficulty in predicting returns**
   It’s not very easy to predict improvements that machine learning can bring to a project. For example, it’s not easy to plan or budget a project using machine learning, as the funding needs may vary during the project, based on the findings. Therefore, it is almost impossible to predict the return on investment. This makes it hard to get everyone on board the concept and invest in it.

4. **Data security**
   The huge amount of data used for machine learning algorithms has created an additional security risk for insurance companies. With such an increase in collected data and connectivity among applications, there is a risk of data leaks and security breaches. A security incident could lead to personal information falling into the wrong hands. This creates fear in the minds of insurers.
Accenture is a proven partner for implementing New IT solutions, having made extensive investments in a dozen research labs worldwide. We have already delivered more than 50 machine learning and AI projects globally in the insurance industry and are active in more than 100 AI engagements. Accenture owns five patents for AI technology for insurance applications and has two more that are patent pending.

OUR UNIQUE RANGE OF CAPABILITIES
WE CAN PROVIDE END-TO-END MACHINE LEARNING OFFERINGS

- Strategy-led framework that focuses on driving business value
- Industry expertise to design optimised processes
- Partnerships with academia to deliver thought leadership and innovative solutions
- Relationships with key technology partners and startups
- Independently test technology components
- Develop integrated solutions that leverage best-of-breed products
- Design scalable, future-proof solutions
- Resources and technology platforms available to prototype and scale
- Industrialised services and cloud capabilities optimised for delivery
- Research and thought leadership dedicated to responsible AI
- Robust service design approach that puts humans at the centre of the solution
- Change management expertise to ensure smooth adoption

Figure 3
As rapid technological advances reshape the insurance landscape, carriers must become more customer-centric, enhance customer service, create better solutions for operational efficiency and build ever more accurate underwriting models. Insurers have no option but to embrace machine learning to remain competitive, drive operational excellence and boost growth.

Although machine learning used to be the exclusive domain of data scientists, it is now possible for business users to build data models and make accurate predictions faster. Insurers already have domain experts: actuaries, claims managers and underwriters, who can contribute to machine learning projects with the right training and tools.

As insurers consider and evaluate machine learning for their organisations, they should bear in mind the importance of automation and seek platforms that automate the entire workflow. However, the journey begins with a pilot model: develop a proof of concept, test the derived machine learning benefits and extend deployments once successful.

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