To remain relevant, traditional insurers will need to move quickly to infuse AI throughout their strategy and operations. A report from PwC forecasted that AI’s initial impact would primarily relate to improving efficiencies and automating existing customer-facing underwriting and claims processes. Over time, its impact will be more far-reaching; it can identify, assess, and underwrite emerging risks and identify new revenue sources, impacting nearly every aspect of the insurance industry.

AI technologies are poised to reimagine the entire insurance lifecycle. It already impacts many points in the customer journey, such as claims, underwriting, and new business. These technologies can handle an ever-expanding range of tasks faster and more accurately than humans, while freeing employees to focus on complex and higher-value activities.

AI as a Capability

While many insurers are starting to see benefits from AI applications, the companies driving significant returns are approaching AI as a capability – not a tool. Insurance carriers can thus gain a competitive edge once they broaden their focus and include the following six areas of AI in their operational strategy:

**“POWER USERS OF AI CAN BOOST PROFITS BY ONE TO FIVE PERCENTAGE POINTS ABOVE INDUSTRY AVERAGES.”**

McKinsey Insights
“Artificial Intelligence: Why a digital base is critical”

Although some insurers have realized the need to invest in AI to slash costs and enhance customer experience, they will need to increase the scale of deployment to reap the benefits and compete effectively with traditional and new-age competition.
1. **Machine Learning:** Machine learning enables computers to automatically learn from data without human intervention and without being explicitly programmed. It is writing a new chapter in the old insurance book. There are five key reasons why this is happening now:

- **New InsurTech players are grabbing market share and setting new standards.** Traditional insurers have no choice but to follow suit.
- **Customers are expecting Netflix or Spotify-like personalization, and have no problem changing providers.** This trend is expected to grow as we see more millennials maturing out of their parents’ policies.
- **Getting started with machine learning is becoming very easy because of open source frameworks, accelerated hardware, pre-trained models available via APIs, validated algorithms, and an explosion of online training.**
- **Machine learning 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 behavior, with higher predictive accuracy.**

The potential applications of machine learning in insurance range from understanding risk appetite and premium leakage, to expense management, subrogation, and litigation and fraud identification.

**SOME USE CASES OF MACHINE LEARNING**

- **Insurance Advice:** Machine learning will play a significant role in customer service, from managing the initial interaction to determining which type of coverage a customer requires. Consumers are seeking the kind of personalized solutions made possible by machine learning algorithms that review their profiles and recommend customized products. At the front end, insurers are making wider use of chatbots on messaging apps to resolve claims queries and answer simple questions.

- **Claims Processing:** Insurers are using machine learning to improve operational efficiency, from claims setup 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.

- **Fraud Prevention:** Machine learning helps insurers identify and flag potential fraudulent claims faster and more accurately. 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.

- **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.

- **Other Applications:** Insurers are also seeing significant benefits from using machine learning across functions such as direct marketing, audits, claims prediction and customer retention.

**Successful Use Case**

- **Captricity has developed algorithms that can extract handwritten or typed forms into a digital form with a 99.9% accuracy, helping insurers to reduce cycle times.**
- **Visual algorithms by Tractable helps in accelerating claim processing by assessing damage repair costs.**
2. **Natural Language Processing:** NLP will play a critical role on the road to digitalization due to the continuous advancement in its algorithms. AI is becoming proficient at understanding spoken or written 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.

Insurers have a unique opportunity to leverage multiple data sources to create deeper customer relationships and become more efficient. NLP applications have been increasing as more companies find uses for their text data. This includes insurance companies with large stores of data from claims and customer support tickets. Apart from the usual data entry, NLP can help underwriters pull up relevant data on the risk they are writing using search-based analytics to speed up data access.

**NLP USE CASES**

- Makes customer service representatives in call centers more effective in answering questions from customers, including automatically answering of simple email requests and usage of chat bots
- Matches reported claims against similar closed claims to speed up decision making process and potentially reduce claims leakage
- Semantic analysis of claims reports to support fraud detection
- Supports desktop review of third-party risk reports by suggesting ratings and including reasoning
- Allows for a more in-depth due diligence process by automatically screening information from internet on specific topics, or names

3. **Behavior Data Models:** Data has always played a central role in the insurance industry. 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 before. Insurers 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.

Most insurance companies process only 10-15% of the data they have access to, most of which is the 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. They need machines to process this information and data models to unearth analytical insights.
Behavioral data models can be used to analyze the real-time customer data from IoT devices for precise risk classification and product innovation. Using that data, insurance companies can launch new products that incentivize life insurance customers to lead healthier lives, or auto insurance customers to drive safer.

**SOME USE CASES OF BEHAVIOR DATA MODELS**

- Armed with more granular data and predictive analytics for insurance modeling, actuaries can build products better suited to dynamic business and market conditions, risk patterns and risk concentrations.

- Chat bots are getting more sophisticated and can review a claim, verify policy details, and pass it through a fraud detection algorithm before sending instructions to the bank to pay for the claim settlement. This can help speed up processes and reduce human error.

- Insurance software incorporating predictive analytics crunches data from behavioral biometrics and behavioral analytics software. It then correlates it against past customer records to detect fraudulent activity and suspicious behavior patterns.

- By measuring customer “Digital Body Language” – think keystrokes, idle time, mouse movements, copy/paste, corrections, etc. – insurers are able to use machine learning to correlate certain behaviors to outcomes like risk and fraud.

- Using behavioral AI tools, companies are able to uncover behavioral insights at the form-field level. This insight allows marketing and customer experience teams to remove bottlenecks, troublesome questions, and chokepoints to optimize form fields for increased conversion and great customer and agent satisfaction. In addition, companies can use innovative predictive behavioral models to measure user intent in real time.

**4. Internet of Things:** IoT-connected insurance represents a new paradigm for the insurance business. This new approach is based on the use of sensors to monitor the state of an insured risk. According to a research study by McKinsey, people owned 12.5 billion networked devices in 2010, a number estimated to increase to more than 50 billion by 2025. IoT technologies enable insurance companies to determine risks more precisely. Digital networking through the IoT can allow insurers to significantly reduce costs and generate additional revenues.

**IOT USE CASES**

- Insurers can partner with companies to provide improved or new cross-industry products and services that leverage IoT technologies

- Insurers can assess risk far more accurately using data on driver behavior and the use of a vehicle

- Networked devices allow insurance companies to establish more intensive and targeted customer

**Successful Use Case**

The analytical model used by Northwestern Mutual at its contact centers enabled it to identify trends in the client experience or CSR service delivery. This reduced AHT by 6 seconds per call, for 1.2 million calls per year and improved reporting efficiency by 40%.

**Successful Use Case**

Liberty Mutual has collaborated with Google Nest to provide its customers the ability to prevent perils. Customers are offered the Nest protect device along with their insurance at no extra cost. This IoT device issues alerts to customers on critical parameters such as smoke, CO2 emission levels and temperature variations. It also rewards the insureds for staying safe.
5. **Voice Authentication:** Also known as voice biometrics, voice recognition, or voice print, this is currently one of the most common forms of AI. When you contact customer service, insurers can use AI to validate your identity and gather basic information prior to being connected to a representative. This frees up time for the employee to complete other tasks. Voice authentication also uses sentiment analysis to automatically and accurately determine emotion and tone in the customer’s voice. When fully integrated with semantic interpretation, this can route calls faster to the appropriate team, meaning less time switching between teams means more time helping and pleasing customers.

**SOME USE CASES OF VOICE AUTHENTICATION**

- It has the potential to simplify identity verification processes while making things a lot harder for fraudsters
- It occurs passively, thus allowing for a smoother customer experience
- It can reduce call time and operational costs by eliminating steps involved in traditional authentication methods

**Computers Vision Use Cases**

- It can be used as an app to recognize vehicle damage and estimate repair costs
- When used in the form of a desktop application, computer vision can use multiple images of the same vehicle to create an all-around image of the car’s damage before reporting damage results to an insurance agent
- Property data in the form of satellite images can help insurers prevent the need for scheduled inspections
- Machine vision-enabled software can analyze the speed and force of collisions and use this information

6. **Computer Vision:** Also known as machine vision, this is AI-based analysis of images from sources like smartphones, drones, low-lying aircraft, satellites, and dashcams. Machine vision has the potential to virtually transform all the stages of underwriting and claims lifecycles. It can help insurers evaluate a broader range of risk and automate decision-making.

**SOME USE CASES OF COMPUTER VISION**

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**Potential of AI in New Business**

The real-time learning and adaptive capabilities of AI provide a ready platform for insurers to explore new product lines, geographies, and customer segments, as well as quickly identify new avenues for revenue expansion. AI systems can improve cross-selling and conversion rates of products, propose tailored products, and help identify new clients.

**Potential of AI in Underwriting Management**

From a restaurant’s health inspection performance to a factory’s OSHA violation history, an incredible amount of data is currently available to underwriters. Human beings just don’t have the ability to deal with this massive amount of data.
AI is poised to take the actionability of data and the accuracy of insurance underwriting to the next level. IoT and tracking devices yield an explosion of valuable data which can be utilized when determining insurance premiums. Fitness and vehicle tracking systems in both the health and auto insurance sectors are giving rise to the dynamic, intelligent underwriting algorithms that cleverly control the way premiums are dictated. One of the expected side effects of using AI in underwriting is an increase in safety and reduction of inherent risks. Using artificial intelligence and machine learning, insurers can save a lot of time and resources involved in the underwriting process, eliminate tedious questions and surveys, and automate the process.

Insurance underwriting bots can automatically explore a customer’s general economic and social profile to determine their living patterns, lifestyle, risk factors, and financial stability. Customers who are more regular in their financial patterns are qualified for lower premiums. Since AI is more capable of strict scrutiny of gathered data, it can predict the amount of risk involved, protecting companies from frauds and give justified insurance amount to customers, including usage-based or on-demand insurance.

AI can also help in underwriting risks where there isn’t much history, such as determining cyber risks.

**The future scope**

- Workers’ comp underwriters will quickly analyze thousands of pages of medical bills and health records to predict injury risks.
- Commercial property underwriters will seamlessly incorporate external data from city governments, regulatory agencies and news sources to get a clearer picture of a risk.
- Life insurance underwriters will automatically incorporate information about your prescription drug history, gym club memberships, shopping habits, and travel plans.
- Commercial property underwriters will analyze public data to learn the locations of each plant around the world, the machinery used inside, the number of workers, their skill sets, and OSHA violation history.

The number of forms and questions will decrease as underwriters let machine modeling do the heavy lifting. This could bring the timeline from months to seconds for some lines of insurance.

**Potential of AI in Claims Management**

Traditionally, the claims processing department is the most labor intensive and therefore the largest cost center for insurers. Meanwhile, work in claims processing is highly standardized and repetitive – and therefore extremely eligible for automation through AI.

The new era of claims management will provide unprecedented visibility into the claims process. Every touchpoint in the claims journey, starting even before an incident occurs, will be supported by a combination of human and digital workforce that seamlessly expedites the process. Digitizing the claims process involves redesigning the process flow from a customer’s perspective and applying technology to facilitate each step in the back-end of the customer journey. In this way, insurers can be more responsive to customer requests, automate low-value transactions, and expedite the claims process.

Satisfaction surveys in claims consistently show that customers desire a fast and intuitive process, as well as transparency on where they are in the process and what happens next. Accordingly, the digital redesign of a claims journey needs to go much deeper than superficial process improvements.
AI algorithms can help segment claims cases by complexity using factual and predicted claims characteristics. Based on this segmentation, claims can be assigned to specific downstream handling processes—either one of the fully digital self-service journeys, such as selecting a direct repair shop in self-service, or a claims handler for more complex cases, such as those with high litigation risk.

The Potential of AI in Risk Management and Fraud Detection

Building AI on top of the data that insurance companies have access to enables more proactive risk management and more granular underwriting.

Using data with AI gives businesses the confidence that risks can be effectively identified and managed while taking into account companies policies and risk culture. Implementing AI does not require companies to turn to completely new processes, but to enhance existing ones and use AI to fill any necessary gaps. AI can examine thousands of loss reports and understand trends that previously would have taken specialist months.

Specialists are still important and required, but AI can improve and speed up their work due to access to quality information.

This means better risk scores, predicting break-even prices, dynamic pricing compared to competitors, or predicting payments per month.

Similarly, in fraud detection, according to FBI estimates, insurance fraud is a whopping $40 billion a year. AI and machine-learning tools enable insurers to spot and flag unusual patterns that a human might miss, potentially helping to reduce the huge fraud amount, as well as the cost of customer premiums.

The future scope

- **Prediction of claim characteristics**: AI can help infer as-yet-unknown characteristics of a claim, such as the likelihood of fraud, total loss, or litigation, to speed up its downstream handling.
Conclusion: Disrupt and Power the Future

The insurance industry is starting to realize the huge impact that AI could have and how it has the potential to change risk dynamics for carriers. At this point, AI is becoming less and less experimental and more of a strategic approach to creating new business opportunities.

The pace of change has accelerated thanks to tremendous increase in the volume of electronic data, the ubiquity of mobile interfaces, and the growing power of AI. In the early years, companies that digitized were at the forefront of the industry. Today, digitization has permeated every level of the competitive landscape. Society’s growing reliance on digital technologies is not only reshaping customer expectations, but also redefining boundaries across industries. Insurers cannot avoid this phenomenon. The mastery of AI would be a key competitive differentiator for insurers moving forward into the digital future.

Digital transformation won’t progress in a giant leap or through an abrupt change—it takes time and commitment. To be able to leverage AI effectively, organizations need to focus on customer and business outcomes leveraging the technology. The advantage of adopting digital systems is that as more data is collected, aggregated and analyzed, the AI system gets better and better at improving and speeding up processes. As change accelerates, only insurers with an agile culture and operating model will be able to keep pace with the radical innovation.

By implementing AI techniques with smaller use cases and simpler products, insurance companies can see how the results fare and scale AI adoption from there. Digital transformation with AI-based systems is expected to help insurers boost customer service, improve processes and cut costs, and eventually move from “detect and repair” to “predict and prevent”.

![Diagram showing the integration of domain, data, context, and artificial intelligence leading to targeted marketing, improved underwriting, accurate pricing, effective claims handling, and enhanced customer experience.](image-url)
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