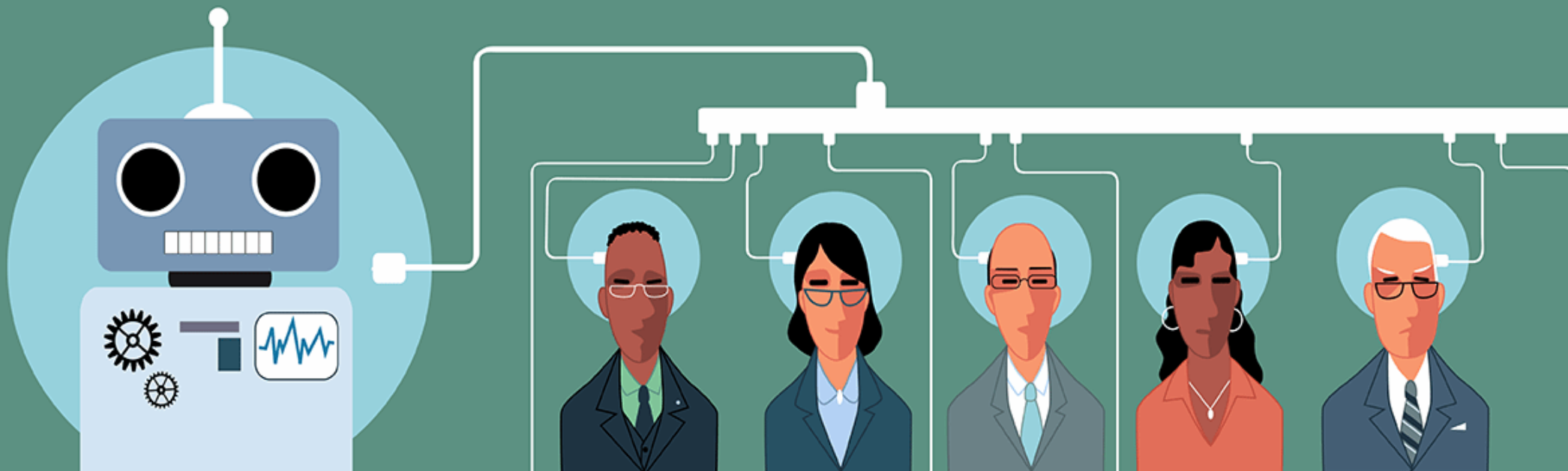


AI Use Cases

A look inside how companies are using this trending tech



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In this e-guide:

AI technology has taken many organizations by storm. But often times, those same organizations are challenged with where or how to apply AI-based technology to meet various business needs.

This guide explores real-life use cases to help inspire how you can incorporate AI into your organization.

Learn how:

- AI in banking brings operational efficiency and supports regulatory compliance
- An insurance company is using machine learning to change their drivers behaviors
- Speech analytics are being used in call centers to solve problems, provide feedback to agents and identify positive results

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■ AI in banking industry brings operational improvements

Ronald Schmelzer, Principal analyst, Cognilytica

The banking industry is primarily a world of computers and networks. It's boggling that the bulk of the world's wealth is stored in databases and transactions are simply the exchange of information over networks.

As impressive -- or scary -- as that might sound, artificial intelligence technologies are aiming to further revolutionize the way banking is done and to improve the relationships between banks and their customers.

Always-on chatbots sidestep banking hours

There's a reason why people deride banking hours; banks never seem to be open when you need them most, such as later in the day or on holidays and weekends. Our money doesn't sleep, so why should the banks?

Fortunately, AI in banking is one of the most impactful applications of artificial intelligence through the use of [conversational assistants](#), or chatbots, to engage customers 24/7. Customers are handling many things using chatbots, even private conversations regarding bank transactions, [bank services and other tasks](#) that don't necessarily require human intervention.

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For example, Bank of America introduced Erica, an AI assistant to help with customer transactions, and the bot has shown significant positive ROI. Many banks have quickly followed suit, although [some saw mixed results](#).

In addition to [fielding customer service inquiries](#) and conversations about individual transactions, banks have been finding good results using chatbots to make their customers aware of additional services and offerings. For example, business customers might not be aware of merchant services and loan offerings that can help resolve payment or credit issues. AI-based assistants that are aware of customer patterns can engage the customer at appropriate times, such as when they are on the bank site or mobile app.

Furthermore, banks can now segment customers individually rather than sorting them into the traditional generalized customer buckets. By using AI-based pattern matching and [behavioral analysis](#), banks are able to make the right offer or suggestion to the right customer, reward their best customers, and respond to immediate finance-related needs.

AI in banking aids regulatory compliance

Banking is one of the most highly regulated sectors of the economy, both in the United States and worldwide. Governments use their regulatory authority to make sure that banks have acceptable risk profiles to avoid large-scale defaults, as well as to make sure that banking customers are not using banks to perpetrate financial crimes, like fraud and money laundering.

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As such, banks have to comply with a myriad of regulations requiring them to know their customers, prevent money laundering, uphold customer privacy, monitor wire transfers and comply with a stack of additional regulations.

Banking regulatory compliance has a significant cost and even higher liability. As a result, banks are looking to smart, [always-on AI assistants](#) to monitor transactions, keep an eye on customer behaviors, and audit and log information for various compliance and regulatory systems.

Big data-enhanced fraud prevention is already having a significant impact on credit card and loan underwriting processes, and the addition of machine learning and cognitive technologies is helping those systems stay ahead of the game as the nature of fraud continues to evolve. By looking at customer behaviors and patterns instead of specific rules, AI-based systems can help banks stay on top of regulatory compliance while minimizing overall risk.

Improving decision-making for loans and credit

Similarly, banks are using AI-based systems to help make more informed, safer, and more profitable loan and credit decisions. Currently, many banks are still confined to the use of credit scores, credit history, customer references and banking transactions to determine whether or not an individual or company is creditworthy.

However, as many will attest, these credit reporting systems are far from perfect and are often riddled with errors, are missing real-world transaction history and are misclassifying creditors. In addition to using data that's available, AI-based loan decision systems can look at behaviors and patterns to determine if a

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customer with limited credit history might, in fact, make a good credit customer, or to find customers whose patterns might increase the likelihood of default.

The challenge with using AI-based systems for loan and credit decisions is that they can suffer from bias-related issues similar to their human counterparts. This is due to how loan decision-making AI models are trained.

Banks looking to use machine learning as part of real-world, in-production systems need to make sure to [factor bias and ethics](#) into their AI training processes to avoid these potential problems. This is especially the case when using AI algorithms, such as deep learning approaches, that are inherently unexplainable.

The [issue of explainability](#) is another potential stumbling block. Financial institutions operate under regulations that require them to explain their credit-issuing decisions to potential customers. This makes it difficult to implement tools built around neural networks, which operate by teasing out subtle correlations between thousands of variables that are typically incomprehensible to the human mind. Explaining the decisions of neural networks is a challenge.

Reducing bank operating costs and risk

The bank industry is largely digital in operation, but it is still riddled with human-based processes that are sometimes paperwork-heavy. With these processes, banks face significant operational cost and risk issues due to the potential for human error.

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AI in banking is being applied to these processes to eliminate much of the time-intensive and error-prone work involved in entering customer data from contracts, forms and other sources. Improved handwriting recognition, [natural language processing](#) and other technologies, combined with intelligent process automation tools, are being used more and more in back-office operations to handle a wide range of banking workflows.

In addition, by replacing these human processes with AI-based automation, banks can impose audit and regulatory control where it previously couldn't.

By replacing humans with intelligent, automated assistants, banks can focus their human resources on higher-value tasks, such as offering new services to their customers or improving customer satisfaction. [According to Accenture](#), banks are seeing between 20-25% savings in their operations by implementing intelligent assistants and AI-based systems into their back-office workflows.

AI assistants for investing

Finally, some banks are delving deeper into the world of AI by using their smart systems to help make investment decisions and support their investment banking research.

Firms like Swiss-based UBS and Netherlands-based ING are having AI systems scour the markets for untapped investment opportunities to inform their algorithmic trading systems. While humans are still in the loop with all these investment decisions, the AI systems are uncovering additional opportunities via better modeling and discovery.

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In addition, many financial services companies are offering robo-advisors that can help their [customers better manage their money](#). Through personalization, chatbots and customer-specific models, these robo-advisors can provide high-quality guidance on investment decisions and are available whenever the customer needs assistance.

In all these ways, AI in banking is continuing to transform the industry to provide a greater level of value to their customers, reduce risks, and increase opportunities as the financial engines of our modern economy.

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Insurer's machine learning use case: Changing driver behavior

Ed Burns, Senior News Writer, SearchEnterpriseAI

A typical machine learning use case might involve recommending products or serving up targeted advertisements to people on websites.

However, one car insurance company wants to take data science a step further and use it to change people's behavior. That's Providence, R.I.-based HiRoad Assurance Co., a subsidiary of insurer State Farm that has built machine learning models to help promote better driving practices by its customers.

Rather than assessing drivers' past history and assigning them rates based on their presumed risk, HiRoad asks customers to download an app that tracks their driving habits to their smartphones. Data points, like average speed, braking distance and cornering speed feed into machine learning algorithms that assess each driver's risk and then assign people rates based on the risk factors. The rates are reset each month based on the previous month's driving.

When customers open the app, they can see how specific driving habits are affecting their rates and see changes they can make that will help lower their rates. Jason Sanchez, HiRoad's vice president of analytics, said this shows how powerful data science can be.

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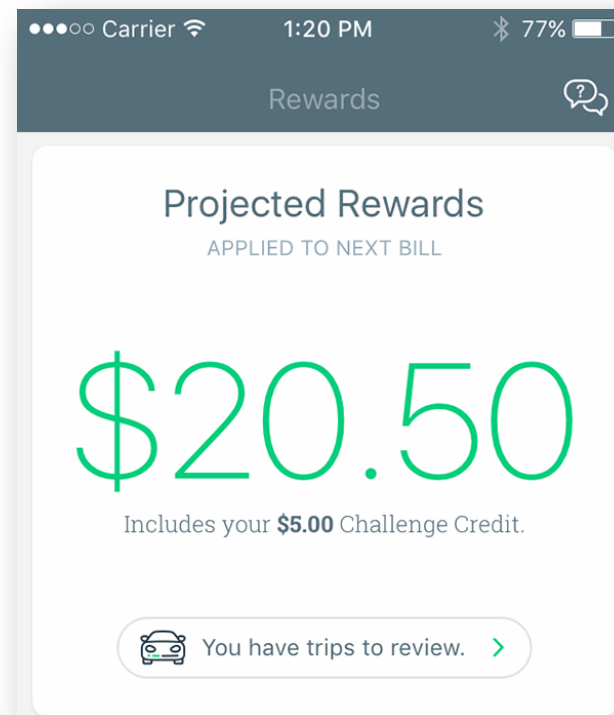
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Reducing risky driving habits

"There are a lot of things machine learning enables that can be used for good," Sanchez said. "You can get one level deeper."

Of course, HiRoad isn't using its data science chops for purely humanitarian reasons. When customers reduce risky driving habits, they get in fewer accidents, which means fewer insurance claims. The company saves money when the number of customers making claims drops. Still, Sanchez said this machine learning use case is an example of how data science can shake up industries in ways that benefit everyone.



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"There's a push to counteract this issue of collisions and traffic fatalities, and we want to be a part of that," Sanchez said. "[Data science] lets you intelligently improve your product. It lets you make confident incremental improvements."

To train its models, HiRoad, which currently operates only in Rhode Island, tapped into State Farm's bank of historical driving data. Its data scientists were able to define actions that led to accidents based on claims histories, and then teach machine learning algorithms to look for those actions in the driving habits of HiRoad's customers.

Collecting data on drivers' trips

The app collects data from each driver's trips and then sends the data back to HiRoad's servers at the end of the trip to be analyzed and scored. Sanchez said this session-based model helped eliminate the complications that can come from trying to do real-time scoring. The algorithms score drivers' habits and send feedback to customers to help them see what actions specifically made their scores change.

Machine learning has already caused major disruption in other industries. Uber shook up transportation with its data science-driven app that efficiently connects drivers with passengers. Airbnb did something similar in the hospitality space. Now, Sanchez hopes HiRoad's machine learning use case can change how auto insurance companies operate.

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"Machine learning enables us to add features to our app that make our product possible," he said. "Without that, the whole business wouldn't be possible."

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AI in call centers amplifies customer voice

George Lawton, Contributor, SearchEnterpriseAI

Nearly all call centers are looking to improve customer experience, and some are starting to look to AI to identify common problems and give more feedback to call center agents to tackle this priority.

"[Speech analytics] can be useful in finding out what frustrates or pleases customers," said Bill Meisel, president of TMA Associates, a natural language technology consultancy.

AI in call centers is built on speech analytics that assesses the emotional quality of customer calls and clusters conversations into similar groups. By looking at examples of each group, managers can understand common characteristics. For example, product managers might be able to identify problems with a new offering more quickly by associating customer frustration with a particular subject.

Companies are also using speech analytics to help human agents identify and work on specific speaking skills that can improve customer interactions. For example, Maryland-based speech coaching software vendor VoiceVibes Inc. worked with the National Science Foundation to create software to measure the qualities correlated with building rapport with listeners.

This is subtly different than emotional analytics. This type of speech analysis can help call centers distinguish between how their agents feel during a call and

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how they are perceived by callers, said Debra Cancro, founder and CEO of VoiceVibes.

To develop the tool, VoiceVibes worked with a panel of expert listeners to score speakers, and then trained neural networks on this set of labeled data to automate the process of scoring new calls. Over time, the neural networks can help identify factors in call quality that may be hard for humans to gauge.

"We measure about 70 features related to pace or pitch, along with other features learned by deep learning directly," Cancro said. "When we make the models, we don't know what makes some speakers better in all cases."

Shining a light on more calls

ABC Financial Services, a payment processor for the health and fitness industry, is one early adopter of speech analytics tools, using a service from CallMiner Inc., a Florida-based software company that customer engagement analytics technology. The technology enables ABC to assess every agent call rather than just a few, as they did in the past.

"We now have the complete journey for every interaction," said Renisenb McGehee, BI analyst at ABC Financial. "Through the use of speech analytics, we have been able to identify and remove objections that prevent our agents from providing the level of service that our company expects."

Using AI in call centers had improved the ability of ABC Financial's analytics team to offer thoughtful recommendations to the call center team to improve

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their existing processes in order to consistently achieve their call quality expectations, McGehee said.

Post-Call Speech Analytics Process

- 1 Speech engine performs initial analysis and converts audio data into phonemes.
- 2 Results are indexed and analyzed.
- 3 A query engine enables searching and accessing of data.
- 4 Results are presented via a dashboard or generated reports.



ABC Financial also uses speech analytics to capture intelligence -- data related to customers' emotional tone or the sentiment associated with their words -- from all customer interactions and make it available to other departments within the organization through dashboards and custom reports.

"This helps us to understand how the information can be useful for our entire company, as well as the health clubs it services," McGehee said

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Different roles for AI

AI has been introduced to speech analytics a couple of different ways. It's used to analyze the emotional characteristics and content of call agents' interactions and to convert calls into transcripts. These transcripts can be analyzed for compliance, efficiency and quality control, said McKay Bird, chief marketing officer at TCN.

"Based on the specific content of the call, agent managers can take the necessary steps to correct the issues through targeted agent coaching or direct customer intervention," said Bird.

Advanced speech recognition tools are built on deep learning neural networks, which improve their recognition of human language over time. Call transcript analysis uses semi-supervised machine learning and weighted rules logic to automatically classify and score calls.

These tools, when used together, produce sentiment and emotion scores by pairing spoken words with characteristics known to be associated with certain feelings -- speaking rate, stress inflection and volume. This helps call center managers understand where customers are demonstrating frustration or if agents are mishandling a call.

Automated scoring can be used to predict outcomes, such as the likelihood of a sale or customer cancellation. Natural language processing can be used to automatically identify topics within groups of conversations and can help to improve the development of call classification rules.

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Start with a measurable outcome

"The biggest challenge to a speech analytics program is defining what you want to achieve with it," said Jeff Gallino, Founder and CTO of CallMiner.

Without clear objectives or goals, a speech analytics program can get off track.

Many companies are going from 1-2% call monitoring to 100% monitoring, which can be overwhelming without clearly defined policies and processes for using the information. Dedicating the appropriate budget to execute a plan and enrolling the organization to embrace change are critical to achieving success when implementing AI in call centers.

One common -- though long-term -- objective companies have when starting speech analytics projects is to reduce overall call volume, said TMA Associates' Meisel. The data can form a strong foundation for further automating the customer service process in the future.

"Speech analytics applied to call center records allow understanding [as to] why customers are contacting a company and provide the core data needed to create natural language chatbots and digital assistants," he said.

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