



AI Solutions for Financial Services

Key Steps to Building Customer-Centric AI



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Introduction

The financial services industry is one of the best examples where, when it comes to artificial intelligence applications, reliable training data and the right engineering team are critical for creating amazing customer-centric experiences. It's an industry where there is little margin for error, and the stakes are high. According to [Cambridge Centre for Alternative Finance](#), by 2022, nearly 64% of financial service companies expect to be “mass adopters” of AI — using it for revenue generation, process automation, risk management, customer service, and client acquisition — compared with just 16% currently.

Yet success isn't guaranteed. In fact, industry analysts find that the average rate of AI projects scaling to production is only 20%.

At Appen, we've not only been fortunate to work with the top leaders in finance, but of the thousands of projects we've supported in many industries, we have found our track record to be over 3x the average deployment rate. This is thanks to our technology, processes, and expertise.

Our work in the financial services space has given us a chance to truly understand just how many opportunities there are for innovation with artificial intelligence (AI). As financial service institutions look to get more creative to find a competitive edge, forward-thinking managers and businesses need to actively pursue AI and become AI-first companies.

While many financial institutions have taken the first steps towards utilizing AI for chatbots, fraud detection, and investment research, there is an opportunity for companies to become truly data-driven in all aspects of their core business and leverage AI to gain competitive advantage.

We've created this guide to help financial services identify and successfully scale AI initiatives from pilot to production by focusing on customer experience.



Competitive Edge with AI

The number of enterprises implementing AI has grown by over 270% since 2016.
– Gartner

The amount of heavy investment (read: **billions of dollars**) into AI initiatives signals a market shift, with companies looking to find a competitive edge, and feeling confident that AI can get them there.

Companies that have already adopted AI report that it has directly impacted their customer satisfaction and ultimately boosted their bottom-line results.

Depending on their AI readiness, companies and executives need to ask themselves two questions: How do you identify use cases that bring tangible business value with AI? And, if you're already experimenting, how do you move from pilot to production?

The first key to success is remembering that it takes time before ROI from AI is visible. Before allowing time for models to expand and prove their value, receiving appropriate stakeholder buy-in is necessary for the benefit of AI. To do this, identify a suite of use cases, business and customer impact, available data, budget, and expertise to execute.

Other critical elements for successfully deploying AI initiatives? Establishing a clear business objective, building an AI Center of Excellence team and architecture, and launching the initiative with a flywheel - which we'll discuss in more detail.

When implemented correctly, AI and machine learning (ML) will deliver wide-sweeping value to businesses across many industries. Our research and experience have found one of the easiest ways to move AI pilots to scaled deployments with discernable profits is to focus on one key objective at a time. We found that most companies have early success by building AI that positively impacts the customer experience - whether it be improving critical touchpoints, call center productivity, or finding new and better ways to serve customers.



How AI is Reshaping the Financial Services Industry in an Experience-first World

60%

of the AI talent pool is currently being absorbed in technology and financial service companies

- MMC Ventures

Financial services underwent a profound transformation – even before AI was introduced – with the move to a digital economy. Within financial service institutions, core business functions are often last to get updates, especially if they are running smoothly.

Consumers now expect services like banking, insurance, and investment to be available online. Rapid digitalization of these services has been a challenge for many financial service institutions who may not have viewed themselves in the technology space, but keeping pace with customer demands and finding opportunities to attract and retain customers has been rewarding. To continue to stand out from competitors and to evolve at a faster pace in the future, **consider strategic AI uses that can help change market perception, provide value to customers, and improve productivity.**

In finance today, success revolves around data, and there are increasingly fewer products that have a physical component to them. This and the need to quickly and accurately process data is what makes the entire industry ripe with opportunities for AI.



Areas Ripe for AI Adoption with the Help of Training Data:



Fintech

- Core product applications
- Accounting
- Payments
- Gateways
- POSs
- eCommerce shopping cart checkout
- Digital currency
- Peer to peer money transfers



Insurance

- Claims management
- Automatic underwriting
- Policy management
- Chatbots
- Intelligent assistants
- Fraud detection / prevention



Banking & Investing

- Chatbots / Intelligent Assistants
- Intelligent assistants
- Asset management recommenders
- Fraud detection / prevention
- KYC/AML applications - i.e. face recognition, fingerprints, other auth
- Financial process automation - i.e. money transfer batching, timing, cash management
- Quantitative Finance
- Signal processing / Sentiment analysis
- Recommender systems
- Contract management

The scope of potential use cases for AI and ML in finance is massive. And while business use cases are becoming more varied across fintech, banking, investing, and insurance, consumer experience-centric applications continue to be the most common and successful to deploy at scale. To do this, companies often have to work with multiple vendors and applications to collect, label, prepare, and converge all that data to train their AI models effectively and deploy the models in production.

However there are a number of challenges that come with developing AI in financial services. Similarly to government or medical applications, they often involve leveraging data

that is mixed with confidential or personally-identifying information (PII). Naturally, companies looking to implement AI need to find a solution which can create accurate training data while accommodating security needs, verified by humans at scale. This can make finding the right partner support difficult, especially in restrictive geographies with very specific PII rules. However, companies can now utilize data partners that can ensure data stays local, offer private cloud and on-premises services to ensure compliance and control of how the data is utilized, have additional protocols in place, like secure digital workspaces, and are GDPR and ISO-certified.



Where to Focus AI Investments



With investment into AI no longer just an option, business leaders should look at how best to become an AI-first company. And while many companies may shudder at thinking this means they need to invest dozens of engineers' time and millions of dollars, this isn't the case. By focusing on the right problem one that solves a core business problem to start a pilot with, scaling to production becomes easier, and starting second and third use-cases can be a fast follow. This enables companies to go from kicking the AI tires to being an industry leader with several AI projects in production within a year.

To do this, it's critical to start with understanding the customer and the customer experience when looking for a core business problem that can benefit from AI. There are many customer touchpoints and transaction data that sit in the front and middle of the house. These areas are rich with data and customer insight that can be used to identify the best opportunities for AI pilots.

Benefits:



Reduced operational costs thanks to process automation.

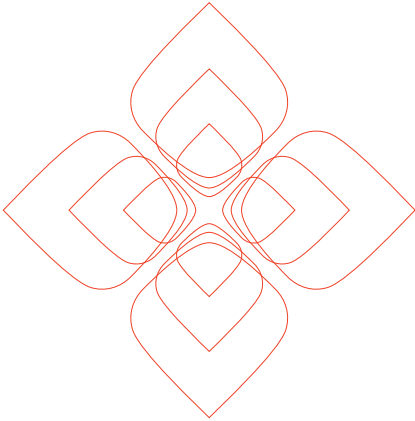


Increased revenues thanks to better productivity and enhanced user experiences.



Better compliance and reinforced security.





While it is important for organizations to think creatively about business use cases, it's also important to consider what data they have available for AI models. Financial institutions have massive amounts of structured and unstructured data, but in some cases, external data sources may be more appropriate. Business units should look at where they can have the most business and customer impact, with the data they have or can obtain, and the expertise they can execute on (or hire for).

According to a [Deloitte survey](#), most financial service frontrunners are exploring AI for revenue enhancements and client experience initiatives. These explorations should be focused on media capabilities, insights, and optimization.

Media Capabilities:

the ability to see, hear, and talk, through the means of areas like voice to text, text to speech, the ability to discern natural language questions, the ability to translate between all of the languages on the planet, and so on.

Insights:

association with analytics that allow companies to know their customer - especially at scale, through micro-segmentation to understand customer needs within a market and identify new product/service opportunities based on findings like behavioral insights

Optimization:

using forward forecasting and modeling to make predictions in advance around areas like peaks and drops in demand, or predicting similarity in performance for new releases



Caution: The pressure to reduce costs continues to be a major business focus. New competitors, increased regulatory oversight, compliance demands, and cybersecurity concerns have made the cost of doing business jump. Because of this, many financial service institutions turn to cost-saving initiatives for their AI investments. While optimization can help labor-intensive and tedious tasks, optimization should also be used to identify and pursue revenue-generating functions through forward forecasting.

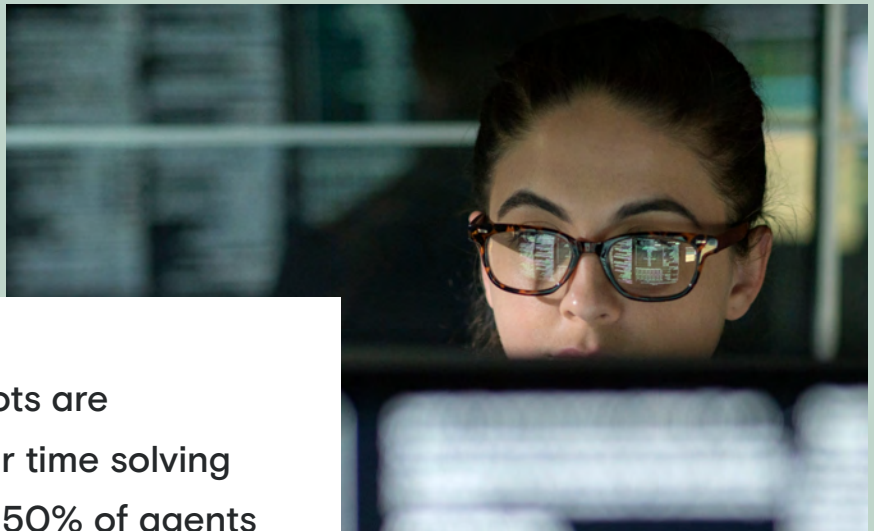
Media Capabilities

Companies should look at the data available to them to see how it can be mapped to something that provides business value. For example, if financial service institutions have difficulty with managing customer wait times during high volumes of calls, consider how natural language processing can be utilized to better serve customers and remove call representatives from spending time routing calls - that way they can be available to do call resolution, instead. If a customer service goal is to respond to everyone within 24 hours, a smart natural language processing application can help a team hit that goal with automation.



64% of agents with chatbots are able to spend most of their time solving complex problems, versus 50% of agents without AI chatbots.”

According to Salesforce's State of Service report [referenced in ZDNet](#)





While many people fear that utilizing AI technologies will replace humans, situations like this enable employees to know their customers better and become more “human” in empathizing with them.

This also opens doors for leveraging audio and text conversations for things like digital chatbots or servicing customers across multiple geographic markets by providing services in their natural languages.



With our platform, consumers get to have these conversations in natural language. In turn, we learn from those conversations and automate them, ensuring that our assistants keep getting better at helping customers find and get what they need.”

Dr. Jack Elliott
Chief Data Scientist

 **Flamingo Ai**



Insights

According to [Accenture](#), **81% of consumers** want brands to understand them better and know when to and when not to approach them. Doubling down on the importance of understanding your client and embracing personalization, [CMO.com](#) found that over half of consumers are willing to pay more for speedy and efficient customer experience.

As financial services continue to modernize, consumer preferences are changing. Consumers are no longer buying a product or service, but instead looking for companies that are committed to understanding their needs, choices, and requirements. Utilizing micro-segmentation allows financial institutions to directly engage with their customers rather than using personas, creating direct channels for conversations, building trust, and growing loyalty.

Personalization is so impactful that the Boston Consulting Group estimated that a bank can garner as much as \$300 million in revenue growth for every \$100 billion it has in assets through customized client interactions.

\$300 million in revenue growth
for every \$100 billion it has in assets
through customized client interactions.

The financial services industry can tap into personalization as well by evaluating available consumer data, starting with demographic details, transaction data, website analytics, merchant data, and more. These can be further supplemented with other datasets that may be on hand such as insight on past experiences, reviews, purchases, clicks, web and app traffic, as well as data from offline channels. From here, machine learning models can be used to draw patterns that can make suggestions based on hyper-personalized learnings. These models can be used by financial service organizations to develop (or identify existing) offerings, products, and services specific to the client, based on fine-tuned behavioral insights.

This can be used to target someone who is, for example, most likely to buy something, or to serve someone appropriate messaging based on an anticipated reaction to a market's movement.

To build an effective ML model for customer insights requires reliable training data. Without proper data annotation, the resulting models will yield disastrous customer experiences such as a chatbot or automated phone system that is so frustrating a customer refuses to use the service or company again.

Optimization

Customer-centric optimization is a very cost-effective tactic for AI initiatives. According to a study conducted by [Juniper Research](#), chatbots can save at least four minutes of a customer service agent's time – saving \$0.70 USD per query, in the process.

While implementing chatbots and improving search isn't limited to financial services, it has been a particularly impactful opportunity as financial services are often bogged down with enormous customer bases, limited human resources, and lack of time to troubleshoot day to day issues for each customer. In fact, in the U.S. it is estimated that over 900 million hours are wasted on hold every year – with the average individual spending 43 days on hold over the course of their life. This is incredibly frustrating for customers, and according to the [American Express Global Customer Service Barometer](#), customers are only willing to wait for a maximum of 13 minutes on hold.

In fact, in the U.S. it is estimated that **over 900 million hours are wasted on hold every year** – with the average individual spending **43 days on hold over the course of their life.**



Financial institutions looking to incorporate process optimization should be careful to avoid approaching AI initiatives as a way to automate entire functions, which may interject additional frustration on customers. Instead, drill down on how parts of the business can be enabled to be more productive with technology.

Identify the right opportunities to improve customer experience and agent productivity with the following workflow:

1
Quantify what easy questions a company gets all the time

2
Understand why this isn't being serviced with automated needs already

3
Ask if this is because search is bad or something new needs to be created

4
Wrangle the cost-savings into a dollar amount

By utilizing virtual assistants, for example, banks can offer a range of services from expenditure tracking and analysis, personalized financial advice, and predictive spending, as well as routing more complicated asks and tasks to agents. By automating some basic processes, customers will spend less time waiting and agents can double down efforts on resolutions - also making the customer happy.

Optimization is not limited to chatbots though. By looking at transaction information in correlation with behavioral insights, financial institutions can optimize their processes for when they release new products. They might take a similar product and use models to forecast the best time to release the product or to even identify what other products might perform well. By using stochastic gradient descent, companies seek to find the lowest common denominator between two things (such as a customer's intent to buy and the time of year), to optimize for the best results. Optimization can also be useful for claims automation, fraud detection based on anomaly detection, improving operational efficiency, customer verification, and more.



Accelerating AI from Pilot to Production with a Data Partner

AI projects begin with data collection of what is immediately available and trying to understand how to use it. Successful approaches to scaling models beyond projects will avoid general data (i.e. collected from public sources and the web), and instead will focus on gathering specific data related to realistic goals and use cases. To be successful, this data will be reliable, clean, and sufficiently annotated, and organizations will commit to data maintenance, outsourcing where they lack expertise.

Teams can spend up to 80% of their efforts **preparing training data**, impacting their ability to invest efforts toward improving models, and turning insights into business value that can actually drive the business. **To ensure AI pilots see the light of day, invest in your training data.** When it comes to actually adopting the strategy of a pilot model and providing ROI, many projects fall short on delivering meaningful results. Not only does this unrealized value often destroy any potential for growth, but it leads to push back from senior management on future cases and difficulty with convincing C-level executives to invest in scaling future pilots.



You can launch world-class AI initiatives by turning to data partners who provide **reliable, high-quality training data** that enables scale through each of the five key phases:

01 Pilot

02 Data Annotation

03 Test & Validation

**04 Scaled Deployment
to Production**

05 Retraining

01 Pilot

Working with a vendor to supply you with reliable training data during your larger pilots will help ensure your models can move quickly through the remaining phases and get you to scale sooner. Your data partner can also help with annotating data that initially yields inaccurate predictions or with annotating multiple scenarios.

02 Data Annotation

Teams that run successful pilots and need to scale are faced with the heavy-lifts of getting more training data. This is when you want to train your model with massive data sets to make sure it works in every scenario, isn't biased, and works the way the model is intended. Further, this data needs to be accurate, or else your model won't be trained properly and won't solve the business problem, resulting in delays, budget overruns, bad customer experience, and blockers in scaling AI initiatives.

Here is where many companies think they can use the general data they have as is, but instead should turn to experts in the data annotation and collection space. This will reduce the time spent on data collection as well as ensure models get trained on data that delivers the highest accuracy possible.

03 Test & Validation

Once you've trained your model, it's important to validate it by using a set of data it was not trained on in order to tune the model. Working with a data partner during the validation phase can help test that the data was properly labeled with the right intent and ensure that the model isn't leading to any biases or failing due to edge-cases. Once your model is dialed in, you'll need an additional set of new data from your data partner that your model was not trained or tuned with to get an unbiased estimate of the skill of the final tuned model.

A data partner can also help you train your AI models with humans in the loop. For those mission-critical use cases, you can tap into a group of people that ensure your AI outputs are of the expected quality for relevant use cases and customer groups.

04 Scaled Deployment to Production

If your model has been successful in the test and validation phases, it's time to scale your deployment. Most large financial institutions have basic skills to do pilots or experiments but need to turn to partners when it comes time to scale to production. This is when data inputs significantly jump in size and could go from 40,000 data points to 40 million, for example. Complicating matters even further, financial institutions need to ensure they scale in a way that's relevant to everyone within the company (i.e. making sure others within the organization can build off their projects). Without considering this, interest may decrease, teams may be shuffled around and experience changing environments, making it hard to access budget. Companies should turn to their data partner to help mitigate these challenges and scale with ease, including providing support beyond initial datasets by further evaluating and validating low-confidence answers so financial services can feel confident taking their pilot to scale.

05 Retraining

Great! You moved to scale – but how long will your model accurately perform at full deployment?

Many companies skip over this critical step or put it on the back burner altogether. Still, the risk of your AI project deploying at scale and being successful long enough to prove ROI becomes increasingly limited the longer retraining is avoided. Retraining allows you to iterate on your model, making it more accurate and successful – this is best done by leveraging a data partner for relabeling data and providing support by using human evaluators to analyze low-confidence predictions.

Transaction data is often data that changes over time. New companies start every day and old ones change their billing names. Customers move and get new landlords or employers. This leads to data drift. Data drift refers to the fact that while you may have captured the ground truth when you built your model, that ground truth changes. And while an NLP practitioner understands that new slang and idioms appear constantly, we don't often think about financial technology companies struggling with this.

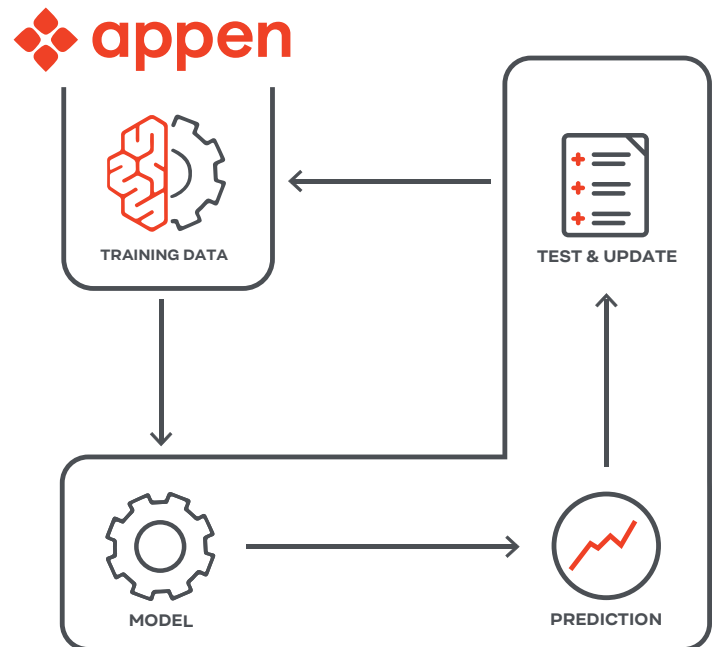
Bonus

Building a Flywheel

To turn AI into a core part of your business, you'll need to build the flywheel to scale your training data-creation and model-building processes across other facets of your business to deliver AI from experiment to production to core product.

This AI flywheel should be a larger part of your organization's AI & data center of excellence, a topic we discuss in greater detail in our [AI Center of Excellence](#) eBook.

According to McKinsey, **one-third of AI products that go live need monthly updates** to keep up with changing conditions, like model drift or use case transformation.



Key Challenges Ahead



While following the above steps seems simple enough, organizations should be aware of and prepare for some key challenges. Doing so will help build in safeguards to keep forward momentum.

Security & Compliance

Data that is collected as part of financial services operations contains sensitive and confidential data that requires additional security measures in place. The right data partner will offer a variety of security options and will also have strong security standards to ensure your customer data is properly handled. Look for data partners who are compliant with industry-specific or region-specific data regulations, such as SOC2 Type II, HIPAA, GDPR, CCPA, and offer options such as secure data access (critical for PII and PHI), secure annotation and onsite service options, private cloud deployment, on-premise deployment, and SAML-based single sign-on.



Secure Data Access ensures all data security requirements are met for customers working with personally identifiable information (PII), protected health information (PHI), and other sophisticated compliance needs.



On-premise deployment deployed in your particular network either air-gapped or non-air-gapped.



Secure crowd and secure onsite service options where contributors access tasks through machines that are owned/operated by the channel in a controlled and monitored physical location.



SAML-based single sign-on (SSO) which gives members access to the our platform through an identity provider (IDP) of your choice.



Private cloud deployment which can be hosted on your specific cloud environment or hosted and managed by us.

Localization



Localization is especially important within the financial services industry. Because financial companies often need to design models with the multiple markets they serve in mind, it's important to factor in different languages, cultures, and demographics to customize the customer experience properly.

As they can leverage teams of skilled linguists to develop things like style guides and voice personas (formal, chatty, etc.), as well as optimizing across many languages. It's great that your model knows how to understand English, but do you have a plan to expand to Spanish, Korean, or Japanese? What about the regional specifics of each customer base?

Transparency, Explainability, and Trust



Creating AI models that provide accurate predictions will only be successful if it can be explained to, understood by, and trusted by customers. Because customer information is being used to develop these models, they will want to be sure that their personal information is being collected responsibly, is being handled and stored securely, and some will even want to understand the basics of how it is being used.

While the most advanced AI applications are more difficult to explain, organizations can review the training data used to develop the model and extract some explainability from the data structure, inputs, and outputs. The validation and retraining processes can shed more light on how your models make predictions and please your customers.

Siloed data



Building the future of financial services is complicated enough without having to connect several dozen different data pipeline components and integrate a plethora of APIs on top of security and compliance concerns. In order for a financial institution to do this effectively, they need to ensure their available data is correctly collected and structured, and that the data enables machine learning models to predict according to the business goals set out in the AI program.

To bring pilots to production, turn to a data partner with extensive security offerings for support. Their expertise will enable financial service companies to put together these demanding components for the consumer experience, paving the way for success and scale.

Looking Ahead



New technology is being deployed to replace and improve existing processes in financial services. Organizations reaching AI readiness and turning to machine learning to help gain a competitive edge will also benefit in their digital transformations thanks to the acceleration from AI strategy development.

When it comes to launching world-class AI, the opportunity for the financial services industry is massive – whether you’re working to improve your chatbot and site search or build models to support your customer support agents. It’s evident that only a fully operational model that reaches deployment will deliver business value – and the best way to beat the less-encouraging odds is to identify use cases where reliable training data (with the right data partner) can get you there.

While the path to entirely AI-driven automation for financial services is gradual, we’re confident that more and more organizations will need substantial amounts of reliable training data to get their AI projects into the real-world. This is only possible by stepping away from siloed approaches, ensuring each new initiative can build upon existing AI pilots, and systematically scaling across the organization to reach core business. Teams that will be the most confident to deploy will do so by having a solid process and a reliable training data partner on their AI journey.

As part of that mission, it’s important to recognize that **world-class AI has to work for everyone, in every market**. Leaders building AI initiatives with the customer in mind should think beyond simple efficiencies, speed, and cost. Removing bias from the data is paramount so that AI recognizes everything and everyone equally. As a top financial services institution, you want your customers to experience frictionless services and be understood by the services they are using, no matter their ethnicity, gender, age, or geography.



Our capabilities for Financial Services:



Automatic Speech Recognition

Improve customer interactions with automatic speech recognition systems by training them to better understand human language.



Fraud Detection

Increase fraud detection rates, reduce false positives, and minimize losses through systems built with high-quality data sets.



Regulation Compliance

Increase an NLP model's ability to determine when internal messages make statements of quid-pro-quo or other activities which are a violation.



Creating Custom Alternative Datasets

Increase your investment research by giving specific criteria for data collection and labels that may not be available with other sources.



Risk Management

Models use human insight to improve the quality of the data used in your machine learning-based risk model.



Semantic Search

Improve your semantic search capabilities with training data that provides user intent and context.



Text-to-Speech

Improve customer interactions with TTS systems that are fluent in every language.



Virtual Assistants and Chatbots

Train your virtual assistant or chatbot to better understand and respond to human interaction, driving higher levels of customer satisfaction.



About Appen

Appen collects and labels images, text, speech, audio, video, and other data used to build and continuously improve the world's most innovative artificial intelligence systems. Our expertise includes having a global crowd of over one million skilled contractors who speak over 180 languages, and the industry's most advanced AI-assisted data annotation platform. Our high-quality training data gives leaders in technology, automotive, financial services, retail, healthcare, and governments the confidence to deploy world-class AI products. Founded in 1996, Appen has customers and offices globally.

- **Five of the top financial service** and software companies
- **One of the three largest** bank holding companies in the US
- **Expertise** in tax, accounting, financial software, banking use cases, payment providers, and gateways
- **Security-cleared staff** available for onsite transcription/annotation
- **PII data capability:** ISO 27001 certified secure facilities, ISO 9001 accredited operations