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Machine Learning - Services Specialization

Partner Assessment Checklist

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Introduction

This document details the requirements and benefits of the Machine Learning - Services Specialization for partners in the Google Cloud Partner Advantage Service Engagement Model. Partners that have achieved this Specialization will have demonstrated success with data exploration, preprocessing, feature engineering, model training, hyperparameter tuning, bias/variance analysis, model evaluation, model deployment, online prediction and/or in leveraging Google's pre-trained Machine Learning APIs.

Google Cloud products that are included in the Machine Learning - Services Specialization are TensorFlow, Kubeflow, Vertex AI, Contact Center AI (CCAI), Document AI, Cloud Natural Language API, Cloud Speech API, Cloud Translation API, Cloud Video Intelligence API, Cloud Vision API, all [AutoML products](#), BigQuery, Cloud Build, Dataflow, Dataproc, Cloud Composer, and Accelerators (CPU, GPU, TPU, and Google Distributed Cloud Edge Appliances).

To qualify for the Machine Learning - Services Specialization, the partner must:

- Satisfy the Specialization prerequisites
- Receive confirmation from Google that prerequisites have been met
- Upon meeting prerequisites, schedule an assessment with ISSI (third-party assessment firm)

- Receive a “Pass” decision on the assessment from Google

Upon achieving Machine Learning - Services Specialization, the partner will receive the following benefits:

- Branding and partner badge with Machine Learning - Services Specialization distinction
- Listing in the Google Cloud Partner Directory with Specialization distinction
- Prioritized lead passing based on Specialization
- Prioritized access to [Partner Marketing Funds](#) for approved marketing campaigns and pipeline created in relation to the Specialization
- Prioritized access to [Deal Acceleration Funds and Partner Services Funds](#) for customer engagements
- Additional Google resources around Responsible AI such as workshops from experts across domains, newsletters, and more
- This may be used as one of the prerequisites for the Data Center Modernization - Services Specialization

Machine Learning - Services Specialization Prerequisites

Specializations have five regional designations: NORTHAM, LATAM, EMEA, JAPAN, and APAC. The region for Specialization is determined based on the primary location of the projects. All projects, certifications, and Customer Success Stories must reflect the region and Specialization. Any partner Specialization that goes through the initial assessment will serve as the partner’s primary region. Once a partner has achieved their Specialization, they can earn that same Specialization category across additional regions. The requirements for regional expansion and more can be found in the [FAQ](#).

Prerequisites	
Partner status	Partner or Premier Level required
Google Cloud alignment	Webpage dedicated to machine learning/AI practice specifically leveraging Google Cloud AI and machine learning products.
Customer Success	<p>Any 10-point combination will satisfy the customer success prerequisite for the partner Specialization primary region.</p> <p><input type="checkbox"/> Customer Success Stories used to reach the 10-point requirement, where solutions were implemented within the last 24 months. An approved Customer Success Story which ended more than 24 months</p>

	<p>ago, may be used to attain the 10 points, but cannot be utilized for the Section 3.0 Capabilities Assessment deeper dive.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Customer Success Stories must be unique and clearly describe the customer problem, solution(s) provided by the partner, and the solution's benefits. <input type="checkbox"/> All Customer Success Stories must be in the region for application and reflect the products/solutions for the Specialization.
Certifications	<p>Must have the following Google Cloud certifications:</p> <ul style="list-style-type: none"> • Four employees with Professional Machine Learning Engineer certifications • Four current, full-time employees must complete Google Cloud Responsible AI training (refer to Responsible AI practices). <p>NOTE: Partners may utilize the same (4) four FTE professionals submitted with the Professional Machine Learning Engineer certifications to complete the Google Cloud Responsible AI Training.</p> <p><i>All certified personnel must be current full-time employees of the partner organization, and certified employees included for the Machine Learning - Services Specialization cannot be included for any other Partner Advantage Specialization. The certified employees must also be located in the region of application.</i></p>
Delivery Readiness Index (DRI)	<p>Delivery Readiness Index (DRI) enrollment specific to the Specialization solution area is required. DRI showcases partner practitioner readiness to deploy Google Cloud solutions by assessing their Google Cloud proficiency (certifications, solutions training, industry expertise, delivery skills, and customer project experience). Make sure your organization and all certified team members are enrolled. Register your certified individuals via the Delivery Readiness Index. To learn more details about the Delivery Readiness Index please reach out to your Google Partner Engineer / Partner Advisor or contact dri-leads@google.com.</p>

Partner Assessment Process

Pre-assessment

The partner may choose to have ISSI conduct a paid, remote pre-assessment in advance of the Specialization assessment. For more information, refer to the Resources section on the [Partner Advantage portal Specialization page](#).

Assessment scheduling

As a general guideline, an assessment will only be scheduled if:

1. the partner has submitted a complete application;
2. Google has verified that the Specialization area prerequisites have been met, and;
3. all customer projects to be considered for the assessment are complete.

At this point, partner contact information will be provided to the third-party assessment firm ISSI for scheduling of the remote, 4-hour validation assessment against this checklist. Once an introduction has been made to ISSI, the partner has 30 calendar days to schedule and complete the assessment. If the assessment has not been completed within this time frame, the application will be declined and the partner will have to re-apply. The cost for an ISSI formal assessment is **\$2,000 USD** billed to partners directly.

Required documentation

Partner should provide documentation for each of the controls in sections 2.0 Customer Success Stories and 3.0 Capabilities Assessment to the third-party assessment firm (ISSI) 48 hours before the scheduled audit date. The remote assessment will be rescheduled if the documentation has not been received within this timeframe. We will make every accommodation to have the assessment conducted in the local language upon request, otherwise, the assessment will be English. Documentation can be in the local language, partners do not need to translate their documentation to English. When submitting your application in the Partner Advantage portal, specify the desired language in the 'comments' section.

Assessment duration and itinerary

As a guideline, partners should plan for half a day for the remote assessment. A sample assessment itinerary is below.

Assessment Agenda Item	Time
Introductions and review of assessment agenda and methodology	10 min
1.0 Partner Overview	15 min
2.0 Customer Success	30 min

3.0 Capabilities Assessment	120 min
4.0 Responsible AI	10 min
5.0 Security (and reliability)	10 min
6.0 Monitoring and reporting	10 min
7.0 Optimization	10 min
Auditor Review/Closing meeting	25 min
Total	240 min

**If the partner is a Google Cloud Managed Service Provider (MSP), assessment checklist items 6.0 through 7.0 can be waived.*

Assessment findings and follow up

At the Review/Closing Meeting, the auditor will present a brief synopsis of the assessment results. Opportunities for Improvement (OFI) will also be presented.

A summary report of the assessment will be provided to the partner within two business days of the remote assessment date.

If there are any open action items, the partner will be given an opportunity to provide written evidence of closure to the assessor within five business days after completion of assessment.

After five business days have passed, the assessor will forward the Assessment Report to Google.

The Google Cloud Partner Specialization team will make a Pass/Fail decision and inform the partner regarding achievement of the Google Cloud Specialization.

Specialization is valid for the designated region for three years from notice of achievement. As long as the partner can demonstrate successful ongoing engagement delivery within the Specialization area, the company can apply for renewal and must meet the current requirements for the applicable Specialization. In addition, all individuals staffed on projects must be enrolled in the [Delivery Readiness Index](#). Google may review and/or revoke the partner's Specialization designation at any time in its sole discretion.

Assessment Checklist/Program Requirements

Prepare for the remote assessment using the “Self-Assessment Checklist” in the Appendix. Evaluate compliance with each of the requirements by answering Yes or No in the “Met” column.

1.0 Partner Overview and Business Plan	
Requirement	Description
1.1 Company overview	<p>Partners must provide a brief description of the following:</p> <ul style="list-style-type: none"> • Company history • Office locations • Countries or regions serviced • Number of employees • Google Cloud AI and machine learning service offerings • Industry focus and customer profile for machine learning service <p>Evidence must include a presentation of not more than five minutes, covering each of the points above, delivered at the start of the assessment.</p>
1.2 Web/social media presence	<p>Partners must have a public webpage/social media describing their value proposition in Google Cloud specific to the Machine Learning - Services Specialization area.</p> <p>Evidence must include a publicly referenceable webpage/social media offering that:</p> <ul style="list-style-type: none"> • Describes the partner's machine learning practice specifically leveraging Google Cloud machine learning products • Includes links to Customer Success Stories, whitepapers, blogs related to the Google Cloud Specialization products listed under 'Introduction' of the checklist
1.3 Google Cloud certified full-time employees	<p>Partners must provide certification ID numbers (for example, CN-12345) for at least four current full-time employees that hold current Google Cloud Professional Machine Learning Engineer certifications and these personnel are deployed only in the partner's Machine Learning - Services Specialization practice.</p> <p>Four current, full-time employees must complete Google Cloud Responsible AI training (refer to Responsible AI practices). These can be the same four employees with Professional Machine Learning Engineer certifications.</p> <p>Evidence must include:</p> <ul style="list-style-type: none"> • Names, email addresses, and certificates (snapshots/documents) • Documentation (for example, HR email, directory page screenshot, HR letter) that certified personnel are currently full-time employees of the partner, must also be presented • All four certified professionals must be enrolled in Delivery Readiness Index
1.4 Delivery Readiness Index - enrollment	<p>All four certified individuals from Section 1.3 must be enrolled in the Delivery Readiness Index. As of July 1, 2023, we recommend that 75% of the MACHINE LEARNING - Services Specialization solution area (Section 1.7 Technical Team) must be enrolled in the Delivery Readiness Index.</p>

	<p>Evidence must include:</p> <ul style="list-style-type: none">• Four DRI IDs aligned to the 4 certified professionals submitted in Section 1.3• Enroll 75%+ of delivery practitioners and/or technical certified or credentialed individuals in your Application Development - Services solution area or practice from Section 1.7• Screenshot of your Delivery Readiness Index (View = Landing Page, 'Highlights')
	<div><div><div><div>ID</div><div>ABCGVDWB3</div><div>Lead Data Engineer</div></div><div>ABCJSBMM8</div><div>Architect</div><div>ABCSRKLCT2</div><div>Data Engineer</div><div>ABCNASCIL7</div><div>Cloud & Devops Architect</div></div><div><p>The Profile View lists the DRI IDs. (Four enrollments are required.)</p></div></div> <div><div>Highlights ⓘ</div><div><div>+4 473</div><div>Total DRI Profiles</div></div><div><div>+5% 77%</div><div>DRI profiles with technical certification</div></div><div><div>15%</div><div>DRI profiles with technical training</div></div><div><div>+9% 53%</div><div>DRI profiles with projects tagged</div></div></div> <p>The Highlights view (above) reveals the total number of DRI practitioners you have enrolled. The percentage (%) of them who are technically certified, % of them who have completed technical training, and % with Google Cloud project experience.</p> <p>To learn more details about the Delivery Readiness Index, please reach out to your Google Cloud Partner Engineer or Partner Advisor; or contact dri-leads@google.com to request an overview.</p>
1.5 Machine learning projects - completed	<p>Partners must describe the number of Google Cloud machine learning projects completed.</p> <p>Evidence must include the names and completion date of machine learning projects within the past 24 months.</p>
1.6 Machine learning projects - active	<p>Partners must describe the number of active Google Cloud machine learning projects. Projects in pipeline or under deployment.</p> <p>Evidence must include the names of customer/project titles and the current phase of machine learning projects active at the time of assessment.</p>

1.7 Technical team - current	<p>Partners must describe their current staffing of the certified, credentialed professionals submitted on the technical team serving their Machine Learning practice.</p> <p>Evidence must include:</p> <ul style="list-style-type: none"> • Personnel names and designations of technical team members dedicated to Google Cloud machine learning practice • Documentation that the personnel are currently full-time employees of the partner (partners could present a high-level organization chart of Google Cloud machine learning practice team) <p>Recommended: Screenshare/ Screenshot of DRI View = Highlight showing 75% of your Machine Learning practice team is enrolled (Partner - Highlight View)</p>
1.8 Technical team - capacity planning	<p>Partners must describe planned investment over the next 12 months in their technical team servicing their Google Cloud machine learning practice.</p> <p>Evidence must include a description or records of capacity planning activities to maintain/expand technical team staffing (for example, resource capacity planning software, Google Sheets, Annual Business Plan, etc.)</p>

2.0 Customer Success	
Requirement	Description
<p>2.1 Google Cloud customer details</p> <p><i>Assessor will be looking for how the partner implements Google Cloud Machine Learning best practices.</i></p>	<p>Partners must provide 10-points of approved and active Customer Success Stories that include evidence of delivering end-to-end machine learning solutions implemented using Google Cloud machine learning products and detail:</p> <ol style="list-style-type: none"> 1. Customer name and country 2. Project name (if any) 3. A list of Google Cloud products implemented for customer 4. Record of the year published (if public) or year implemented (if not publicly referenceable) 5. Description of the challenge or problem faced by the customer that the partner identified and/or proposed a Google Cloud machine learning solution 6. The business benefits/ROI that the customer has observed post-implementation of the partner's proposed machine learning solution <p>Evidence must include documentation, communication, or proposal between partner and customer addressing each of the above points for each of the Customer Success Stories used to reach the 10-point requirement, where:</p> <ul style="list-style-type: none"> • Solutions were implemented within the last 24 months

	<ul style="list-style-type: none"> Customer Success Stories must be unique and clearly describe the customer problem, solution(s) provided by the partner, and the solution's benefits All Customer Success Stories must be in the region for application and reflect the products/solutions for the Specialization Customer Success Stories utilized previously to attain another Specialization cannot be reused Only one (1) active Expertise may be combined with each Customer Success Story that aligns with the technical solution pillar and region To be considered for audit, all Customer Success Stories and Expertise IDs must be submitted in the partner's application
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3.0 Capabilities Assessment		Link to Google Cloud Machine Learning Best Practices
<p>The partner's Machine Learning - Services Specialization capability will be assessed via three demos, each of which requires the following four artifacts: 1) Code and repository, 2) Data in Google Cloud, 3) Whitepaper, and 4) Proof of deployed model. Each demo needs to be presented as a customer-facing deliverable (i.e., these demos, when presented, will enable the customer to fully comprehend the partner's Expertise in the Machine Learning - Services Specialization).</p>		
<p>Demo #1: Example of an end-to-end TensorFlow pipeline using the Chicago taxi trips dataset (BigQuery) to improve its service. This demo requires the use of either Vertex AI or Kubeflow (deployed on GKE), with data pre-processing performed using Dataflow, BigQuery, or Dataproc.</p>		
Item	Requirement	Description
3.1.1 Code <i>Partners must demonstrate the detailed capabilities outlined in the demo. The default is the partner makes a demo based on the scenario and data listed in the demo section. However, If partners can do this with a real-life customer engagement, and</i>	3.1.1.1 Code repository	<p>Partners must provide a link to the code repository (for example, GitHub, GitLab, Google Cloud Certificate Signing Request (CSR), which includes a ReadMe file.</p> <p>Evidence must include an active link to the code repository containing all code that is used in demo #1. This code must be reviewable/readable by the assessor, and modifiable by the customer. In addition, the repository should contain a ReadMe file with code descriptions and detailed instructions for running the model/application.</p>
	3.1.1.2 Code origin certification	<p>Partners must certify to either of these two scenarios: 1) all code is original and developed within the partner organization, or 2) licensed code is used, post-modification.</p> <p>Evidence must include a certification by the partner organization for</p>

are able to share the code / documentation that demonstrates the same capabilities, that can be used to fulfill this requirement. If other datasets are utilized, please ensure the partner has acquired all of the appropriate licenses.		either of the above code origin scenarios. In addition, if licensed code is used post-modification, the partner must certify that the code has been modified per license specifications.
3.1.2 Data	3.1.2.1 Dataset in Google Cloud	Partners must provide documentation of where the data of demo #1 is stored within Google Cloud (for access by the machine learning models during training, testing, and in production). Evidence must include the project name and project ID for the Google Cloud Storage bucket or BigQuery dataset with the data (for demo #1).
3.1.3 Whitepaper/ blog - describes the key steps of machine learning model development	3.1.3.1 Business goal and machine learning solution	Partners must describe: <ul style="list-style-type: none"> • The business question/goal being addressed • The machine learning use case • How machine learning solution is expected to address the business question/goal Evidence must include (in the whitepaper) a top-line description of the business question/goal being addressed in this demo, and how the proposed machine learning solution will address this business goal.
Provide a link to a whitepaper or blog post (can be a duplicate of what is used for the capability assessment) describing how you ensure machine learning projects address the security and privacy concerns associated with your machine	3.1.3.2 Data exploration	Partners must describe the following: <ul style="list-style-type: none"> • How and what type of data exploration was performed • What decisions were influenced by data exploration Evidence must include a description (in the whitepaper) of the tools used and the type(s) of data exploration performed, along with code snippets (that achieve the data exploration). Additionally, the whitepaper must describe how the data/model algorithm/architecture decisions were influenced by the data exploration.
	3.1.3.3 Feature engineering	Partners must describe the following: <ul style="list-style-type: none"> • What feature engineering was performed

<p>learning efforts. For example, how do you ensure sensitive training data stored in Google Cloud is properly secured, do you consider de-identification (masking, bucketing, etc.) of datasets, etc?.</p>		<ul style="list-style-type: none"> What features were selected for use in the machine learning model and why <p>Evidence must include a description (in the whitepaper) of the feature engineering performed (and rationale for the same), what original and engineered features were selected for incorporation as independent predictors in the machine learning model, and why. Evidence must include code snippets detailing the feature engineering and feature selection steps.</p>
	<p>3.1.3.4 Preprocessing and the data pipeline</p>	<p>The partner must describe the data preprocessing pipeline, and how this is accomplished via a package/function that is a callable API (that is ultimately accessed by the served, production model).</p> <p>Evidence must include a description (in the whitepaper) of how data preprocessing is accomplished using Dataflow, BigQuery and/or Dataproc, along with the code snippet that performs data preprocessing as a callable API.</p>
	<p>3.1.3.5 Machine learning model design(s) and selection</p>	<p>Partners must describe the following:</p> <ul style="list-style-type: none"> Which machine learning model/algorithm(s) were chosen for demo #1 What criteria were used for machine learning model selection <p>Evidence must describe (in the whitepaper) selection criteria implemented, and the specific machine learning model algorithms that were selected for training and evaluation purposes. Code snippets detailing the model design and selection steps must be enumerated.</p>
	<p>3.1.3.6 Machine learning model training and development</p> <p>TIP: Assessor will be looking for how the partner implements Google Cloud Machine Learning best practices.</p>	<p>Partners must document the use of Vertex AI or Kubeflow for machine learning model training, and describe the following:</p> <ul style="list-style-type: none"> Dataset sampling used for model training (and for independent dev/test datasets) and justification of sampling methods Implementation of model training, including adherence to Google Cloud best practices for distribution, device usage, and monitoring The model evaluation metric that is implemented, and a discussion of why the implemented metric is optimal given the business question/goal being addressed Hyperparameter tuning and model performance optimization How bias/variance were determined (from the train-dev datasets) and tradeoffs used to influence and optimize machine learning model architecture

		<p>Evidence must describe (in the whitepaper) each of the machine learning model training and development points (above). In addition, code snippets that perform each of these tasks need to be enumerated.</p>
	3.1.3.7 Machine learning model evaluation	<p>Partners must describe how the machine learning model, post-training, and architectural/hyperparameter optimization performs on an independent test dataset.</p> <p>Evidence must include records/data (in the whitepaper) of how the machine learning model developed and selected to address the business question performance on an independent test dataset (that reflects the distribution of data that the machine learning model is expected to encounter in a production environment). In addition, code snippets on model testing need to be enumerated.</p>
3.1.4 Proof of Deployment	3.1.4.1 Model/ application on Google Cloud	<p>Partners must provide proof that the machine learning model/application is deployed and served on Google Cloud with Vertex AI or Kubeflow.</p> <p>Evidence must include the Project Name and Project ID of the deployed cloud machine learning model and client.</p>
	3.1.4.2 Callable library/ application	<p>Partners must demonstrate that the machine learning model for demo #1 is a callable library and/or application.</p> <p>Evidence must include a demonstration of how the served model can be used to make a prediction via an API call.</p>
	3.1.4.3 Editable model/ application	<p>Partners must demonstrate that the deployed model is customizable.</p> <p>Evidence must include a demonstration that the deployed model is fully functional after an appropriate code modification, as might be performed by a customer.</p>
<p>Demo #2: Example of an end-to-end machine learning pipeline using the Black Friday dataset to increase profits. This demo can be implemented using either Vertex AI (or Endpoints) or Dataproc, and can utilize any available machine learning library on Google Cloud (for example, XGBoost, scikit-learn, tf.Keras, Spark machine learning).</p>		
3.2.1 Code Origin	3.2.1.1 Code repository	<p>Partners must provide a link to the code repository (for example, GitHub, GitLab, Google Cloud CSR), which includes a ReadMe file.</p> <p>Evidence must include an active link to the code repository containing all code that is used in demo #2. This code must be reviewable/readable by the assessor, and modifiable by the customer.</p>

TIP: Please certify (1) the code is there and the partner has independently developed it OR (2) if

<p><i>the partner reused any open source code to ensure the origin of that code is clear.</i></p> <p><i>Provide an example that does not simply use transfer learning, since there are published blog posts on this. You will need to show an example that creates a customized estimator instead of using the high level Estimator API.</i></p>		In addition, the repository should contain a ReadMe file with code descriptions and instructions for running models/applications.
	3.2.1.2 Code origin certification	<p>Partners must certify to either of these two scenarios: 1) all code is original and developed within the partner organization, or 2) licensed code is used, post-modification.</p> <p>Evidence must include a certification by the partner organization for either of the above code origin scenarios. In addition, if licensed code is used post-modification, the partner must certify that the code has been modified per license specifications.</p> <ul style="list-style-type: none"> NOTE: There are no example templates, however, a document with the headings outlined in the application requirements is sufficient.
3.2.2 Data	3.2.2.1 Dataset in Google Cloud	<p>Partners must provide documentation of where within Google Cloud the data of demo #2 is stored (for access by the machine learning models during training, testing, and in production).</p> <p>Evidence must include the Project Name and Project ID for the Google Cloud storage where the dataset (for demo #2) reside.</p>
<p>3.2.3 Whitepaper / blog - describes the key steps of machine learning model development</p> <p>Security consideration:</p> <p><i>Provide a link to a whitepaper or blog post (can be a duplicate of what is used for the capability assessment) describing how you ensure ML projects address the security and</i></p>	3.2.3.1 Business goal and machine learning solution	<p>Partners must describe:</p> <ul style="list-style-type: none"> The business question/goal being addressed The machine learning use case How the machine learning solution is expected to address the business question/goal <p>Evidence must include (in the whitepaper) a top-line description of the business question/goal being addressed in this demo, and how the proposed machine learning solution is expected to address this business goal.</p>
	3.2.3.2 Data exploration	<p>Partners must describe the following:</p> <ul style="list-style-type: none"> How and what type of data exploration was performed What decisions were influenced by data exploration <p>Evidence must include a description (in the whitepaper) of the tools used and the type of data exploration performed, along with code snippets (that achieve the data exploration). Additionally, the whitepaper must describe how the data/model algorithm/architecture decisions were influenced by the data exploration.</p>

<p><i>privacy concerns associated with your machine learning efforts. For example, how do you ensure sensitive training data stored in Google Cloud is properly secured, do you consider de-identification (masking, bucketing, etc.) of datasets, etc.</i></p>	<p>3.2.3.3 Feature engineering</p> <p><i>Feature engineering is a core part of the machine learning life cycle. Do not omit this section.</i></p>	<p>Partners must describe the following:</p> <ul style="list-style-type: none"> • What feature engineering was performed • What features were selected for use in the machine learning model and why <p>Evidence must include a description (in the whitepaper) of the feature engineering performed (and rationale for the same), what original and engineered features were selected for incorporation as independent predictors in the machine learning model, and why. Evidence must include code snippets detailing the feature engineering and feature selection steps.</p>
	<p>3.2.3.4 Preprocessing and the data pipeline</p>	<p>The partner must describe the data preprocessing pipeline, and how this is accomplished via a package/function that is a callable API (that is ultimately accessed by the served, production model).</p> <p>Evidence must include a description (in the whitepaper) of how data preprocessing is accomplished, along with the code snippet that performs data preprocessing as a callable API.</p>
	<p>3.2.3.5 Machine learning model design(s) and selection</p>	<p>Partners must describe the following:</p> <ul style="list-style-type: none"> • Which machine learning model/algorithm(s) were chosen for demo #2? • What criteria were used for machine learning model selection? <p>Evidence must describe (in the whitepaper) selection criteria implemented, as well as the specific machine learning model algorithms that were selected for training and evaluation purposes. Code snippets detailing the model design and selection steps must be enumerated.</p>
	<p>3.2.3.6 Machine learning model training and development</p>	<p>Partners must document the use of Vertex AI or Dataproc for machine learning model training, and describe the following:</p> <ul style="list-style-type: none"> • Dataset sampling used for model training (and for dev/test independent datasets) and justification of sampling methods • Implementation of model training, including adherence to Google Cloud best practices for distribution, device usage, and monitoring • The model evaluation metric that is implemented, and a discussion of why the implemented metric is optimal given the business question/goal being addressed • Hyperparameter tuning and model performance optimization

		<ul style="list-style-type: none"> How bias/variance were determined (from the train-dev datasets) and tradeoffs used to influence and optimize machine learning model architecture <p>Evidence must describe (in the whitepaper) each of the above machine learning model training and development points. In addition, code snippets that accomplish each of these tasks need to be enumerated.</p>
	3.2.3.7 Machine learning model evaluation	<p>Partner must describe how the machine learning model, post-training, and architectural/hyperparameter optimization performs on an independent test dataset.</p> <p>Evidence must include records/data (in the whitepaper) of how the machine learning model developed and selected to address the business question performed on an independent test dataset (that reflects the distribution of data that the machine learning model is expected to encounter in a production environment). In addition, code snippets on model testing need to be enumerated.</p>
	<p>3.2.3.8 Fairness analysis</p> <p>TIP: Provide answers to: What? Why? How?</p>	<p>Partner must describe possible fairness and bias implications of a profit maximization model trained on the Black Friday dataset and used for targeted marketing. How would they determine if the model had biases, and what they would do to mitigate the biases?</p> <p>Evidence must include a discussion of the implications of including purchaser demographics in a model used for targeted marketing, detail of at least one way to test for bias (for example, fairness indicators, comparing the model performance with and without demographics) and detail of at least one way to mitigate bias (for example, removing the demographic and location fields, using mindiff to equalize the profit prediction across certain demographic characteristics). Stating the model shouldn't be used for marketing is acceptable in lieu of a discussion of how to correct bias. Refer to this page for more information. 300–600 words recommended.</p>
3.2.4 Proof of deployment	3.2.4.1 Model/application on Google Cloud	<p>Partners must provide proof that the machine learning model/application is deployed and served on Google Cloud with Vertex AI (or Endpoint) or Dataproc.</p> <p>Evidence must include the Project Name and Project ID of the deployed machine learning model.</p>

	3.2.4.2 Callable library/application	<p>Partners must demonstrate that the machine learning model for demo #2 is a callable library and/or application.</p> <p>Evidence must include a demonstration of how the served model can be used to make a prediction via an API call.</p>
	3.2.4.3 Editable Model/application	<p>Partners must demonstrate that the deployed machine learning model is customizable.</p> <p>Evidence must include a demonstration that the deployed model is fully functional after an appropriate code modification, as might be performed by a customer.</p>
<p>Demo #3: Example of a machine learning model using Contact Center AI (CCAI), pre-trained machine learning APIs or AutoML and trained/evaluated using <u>any dataset</u>. If using pre-trained machine learning APIs, the training of the model need not be described. If using AutoML, hyperparameter tuning and model design/architecture optimization need not be described.</p>		
3.3.1 Code	3.3.1.1 Code repository	<p>Partners must provide a link to the code repository (for example, GitHub, GitLab, Google Cloud CSR), which includes a ReadMe file.</p> <p>Evidence must include an active link to the code repository containing all code that is used in demo #3. This code must be reviewable/readable by the assessor, and modifiable by the customer. In addition, the repository should contain a ReadMe file with code descriptions and instructions for running models/applications.</p>
	3.3.1.2 Code origin certification	<p>Partners must certify to either of these two scenarios: 1) all code is original and developed within the partner organization, or 2) licensed code is used, post-modification.</p> <p>Evidence must include a certification by the partner organization for either of the above code origin scenarios. In addition, if licensed code is used post-modification, the partner must certify that the code has been modified per license specifications.</p>
3.3.2 Data	3.3.2.1 Dataset in Google Cloud	<p>Partners must describe the dataset being used for demo #3 and provide documentation of where within Google Cloud the data of demo #3 is stored (for access by the machine learning models during training, testing, and in production, as appropriate).</p> <p>Evidence must include the Project Name and Project ID for the Google Cloud storage where the dataset (for demo #3) resides, and a description of the independent features and outcome variables of interest within the dataset.</p>

3.3.3 Whitepaper / blog - describes the key steps of machine learning model development	3.3.3.1 Business goal and machine learning solution	<p>Partners must describe:</p> <ul style="list-style-type: none"> • The business question/goal being addressed • The machine learning use case • How the machine learning solution is expected to address the business question/goal <p>Evidence must include (in the whitepaper) a top-line description of the business question/goal being addressed in this demo, and how the proposed machine learning solution is expected to address this business goal.</p>
	3.3.3.2 Data Exploration	<p>Partners must describe the following:</p> <ul style="list-style-type: none"> • How and what type of data exploration was performed • What modeling decisions were influenced by data exploration <p>Evidence must include a description (in the whitepaper) of the tools used and the type of data exploration performed, along with code snippets (that achieve the data exploration). Additionally, the whitepaper must describe how decisions regarding the use of pre-trained machine learning APIs or AutoML were influenced by data exploration.</p>
	3.3.3.3 Feature engineering	<p>Partners must describe the following:</p> <ul style="list-style-type: none"> • If and what kind of feature engineering was performed • What features were selected for use in the machine learning model and why <p>Evidence must include a description (in the whitepaper) of the feature engineering performed (and rationale for the same), what original and engineered features were selected for incorporation as independent predictors in the machine learning model, and why. Evidence must include code snippets detailing the feature engineering and feature selection steps.</p>
	3.3.3.4 Preprocessing and the data pipeline	<p>The partner must describe the data preprocessing pipeline, and how this is accomplished via a package/function that is a callable API (that is ultimately accessed by the served, production model).</p> <p>Evidence must include a description (in the whitepaper) of how data preprocessing is accomplished, along with the code snippet that accomplishes data preprocessing as a callable API.</p>
	3.3.3.5 Machine learning model	Partners must describe either of the following:

	design(s) and selection	<ul style="list-style-type: none"> Which pre-trained machine learning API was chosen demo #3, and why <p>OR</p> <ul style="list-style-type: none"> Which AutoML product was chosen for demo #3 <p>Evidence must describe (in the whitepaper) selection criteria implemented, as well as the specific machine learning model algorithms that were selected for training or evaluation purposes (as appropriate). Code snippets detailing the incorporation of the pre-trained machine learning APIs or the AutoML product into the machine learning model solution for demo #3 must be enumerated.</p>
	3.3.3.6 Machine learning model training and development	<p>If the partner implements pre-trained APIs, this control can be skipped.</p> <p>If the partner is using AutoML, the following must be described:</p> <ul style="list-style-type: none"> Dataset sampling used for model training (and for dev/test independent datasets) and justification of sampling methods Implementation of AutoML based model training The model evaluation metric that is implemented, and a discussion of why the implemented metric is optimal given the business question/goal being addressed <p>Evidence must describe (in the whitepaper) each of the above machine learning model training and development points (if AutoML is implemented in demo #3). In addition, code snippets that accomplish each of these tasks need to be enumerated.</p>
	3.3.3.7 Machine learning model evaluation	<p>Partners must describe how the machine learning model, whether implemented using pre-trained machine learning APIs or via AutoML, performs on an independent test dataset.</p> <p>Evidence must include records/data (in the whitepaper) of how the machine learning model developed and selected to address the business question performed on an independent test dataset that reflects the distribution of data that the machine learning model is expected to encounter in a production environment. In addition, code snippets on model testing need to be enumerated.</p>
3.3.4 Proof of Deployment	3.3.4.1 Model/application on Google Cloud	<p>Partners must provide proof that the machine learning model/application is deployed and served on Google Cloud.</p> <p>Evidence must include the Project Name and Project ID of the deployed machine learning model.</p>

	3.3.4.2 Callable library/application	Partners must demonstrate that the machine learning model for demo #3 is a callable library and/or application. Evidence must include a demonstration of how the served model can be used to make a prediction via an API call.
	3.3.4.3 Editable model/application	Partners must demonstrate the deployed machine learning model, if using any AutoML product, is customizable. Evidence must include a demonstration that the deployed model, if using any AutoML product, is fully functional after an appropriate code modification, as might be performed by a customer.

4.0 Responsible AI	
Requirement	Description
4.1 Executive sponsorship for Responsible AI	Partners must designate an executive sponsor for Responsible AI within their organization. Evidence must attest in writing they have an executive sponsor for Responsible AI in their organization.
4.2 Training on Responsible AI	Partners must make available training or education materials for employees on Responsible AI, including issues of fairness, accountability, transparency, safety, and explainability in machine learning. Example reference: Google's Responsible AI training . Evidence must include text or links describing what education and training has been made available to employees in their organization. Education and training can be publicly available resources or organization-specific.
4.3 Responsible AI objectives and policies	Partners must document objectives to guide the responsible development of AI/ML within their organization, and have in place policies and procedures to meet these objectives. Example reference: Google AI principles . Evidence must include text describing their Responsible AI objectives, and what their policies and processes are related to compliance with these objectives. They should also describe their internal review process, if applicable. The description should be 500–750 words.

5.0 Security and Reliability	
Requirement	Description
5.1 Security policies	<p>Partners must have security policies and procedures for the protection of internal and customer systems.</p> <p>Evidence may include documented security policies and procedures covering the protection of partner internal systems and customer systems from any form of security threats, or partner to provide current certification of ISO 27001. The document should include the applicable Google Cloud security policies and procedures such as.</p> <ol style="list-style-type: none">1. IAM and least privilege2. Encrypted storage of customer information and data
5.2 Availability and resilience	<p>Partners must ensure the availability and resiliency of their machine learning application and network connectivity. Network connectivity resilience should be in place and partners must conduct ongoing capacity planning for supporting their customers.</p> <p>Evidence may include documentation for how the partner ensures high network and application availability, resiliency (for example, in the face of unforeseen changes in traffic (DoS attacks), and how the partner plans capacity to account for future growth in customer demand on their network.</p>
5.3 Capacity Planning	<p>Architecture design to support flexible scaling for production ready ML operations. Plan ahead of customer and solution requirements to build the needed architecture to support future capacity.</p> <p>Evidence may include architecture design.</p>

6.0 Monitoring and Reporting	
Requirement	Description

6.1 Monitoring systems/tools and reporting	<p>Partners must have systems or tools in place for logging and monitoring customer infrastructure on Google Cloud (for example, Google Cloud operations suite, Nagios, SolarWinds, ELK Stack). Partners must provide system performance analysis reporting to customers.</p> <p>Evidence may include a technology demonstration for the logging and monitoring tools (Google Cloud or third-party). Information on processing of various logs, such as system logs, audit logs, VPC logs. Custom metrics reporting from tools. Evidence must have example reports of system performance provided to customers.</p>
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7.0 Optimization	
Requirement	Description
7.1 Application optimization	<p>Partners must perform testing to ensure efficient performance of application and optimal deployment on Google Cloud infrastructure.</p> <p>Evidence must include performance analysis and data on iterative improvement of application performance (for example, code performance efficiency, optimized deployment on Google Cloud resources) and examples of implementation for the customer.</p>
7.2 Cost optimization	<p>Partner reviews customer Google Cloud spend periodically over time and provides recommendations for cost optimization and improvement.</p> <p>Evidence must include process documentation describing cost review cadence and how cost optimization is performed and communicated to the customer.</p>

Appendix: Self-Assessment Checklist

(Make a copy and submit to Google)

Instructions: In preparation for the remote assessment, complete the checklist below to self-assess compliance with each of the requirements, using the Met (Yes/No) column. If you have indicated "No" for any of the following rows, we recommend scheduling a pre-assessment with ISSI prior to submitting your application. For more information, refer to the 'Resources' section on the [Partner Advantage portal Specialization page](#).

If all fields are marked "yes", copy your completed 'Appendix: Self-Assessment Checklist' to a new Google Doc and submit on the Partner Advantage portal Specialization page. Share access to this application with partner-specializations@google.com before submitting. If any of the prerequisites are not satisfied and/or if there are data inaccuracies, the application will be declined.

1.0 Partner Overview and Business Plan	Comments	Met (Yes/No)					
1.1 Company overview							
1.2 Web/social media presence							
1.3 Google Cloud certified full-time employees Four full-time employees with current Professional Machine Learning Engineer certifications Note: Certifications may not be used for another Partner Specialization. You can verify your certified employees and find the cert ID in your Partner Account .	<table border="1"> <thead> <tr> <th>Certification IDs (4)</th></tr> </thead> <tbody> <tr> <td>e.g., CN-12345, Name, Email Address</td></tr> <tr> <td></td></tr> <tr> <td></td></tr> <tr> <td></td></tr> </tbody> </table> <p><i>All certifications must be active, and align to both the technical solution and region of the Specialization application. There are no exceptions or substitutions.</i></p>	Certification IDs (4)	e.g., CN-12345, Name, Email Address				
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e.g., CN-12345, Name, Email Address							
1.4 Delivery Readiness Index - enrollment	<table border="1"> <thead> <tr> <th>Delivery Readiness Index IDs*</th></tr> </thead> <tbody> <tr> <td>(Aligned to 4 certified professionals from in Section 1.3)</td></tr> </tbody> </table>	Delivery Readiness Index IDs*	(Aligned to 4 certified professionals from in Section 1.3)				
Delivery Readiness Index IDs*							
(Aligned to 4 certified professionals from in Section 1.3)							

<p>*Required: Must align to the 4 certified professionals required in Section 1.3</p> <p>**Recommended: Add more rows for additional Delivery Readiness Index IDs based on 75% of your current Technical Team who are individually certified professionals within your MACHINE LEARNING practice submitted via Section 1.7 as your Technical Team.</p> <p>**NOTE: A screenshot of DRI IDs described in Section 1.4 is also acceptable.</p>	<div style="border: 1px solid black; padding: 5px;">e.g., ABCSWIAD8 or Insert Screenshot of DRI IDs</div> <div style="border: 1px solid black; height: 40px;"></div> <div style="border: 1px solid black; height: 40px;"></div> <div style="border: 1px solid black; height: 40px;"></div> <div style="background-color: #f2f2f2; border: 1px solid black; padding: 10px; text-align: center;"> Delivery Readiness Index IDs** (75% of certified technical team) </div> <div style="border: 1px solid black; padding: 5px;">e.g., ABCSWIAD8 or Insert Screenshot of DRI IDs</div> <div style="border: 1px solid black; height: 40px;"></div> <div style="border: 1px solid black; height: 40px;"></div> <div style="border: 1px solid black; height: 40px;"></div> <div style="border: 1px solid black; height: 40px;"></div> <div style="border: 1px solid black; height: 40px;"></div> <div style="border: 1px solid black; height: 40px;"></div> <div style="border: 1px solid black; height: 40px;"></div>	
1.5 Machine learning projects - completed		
1.6 Machine learning projects - active		
1.7 Technical team - current		
1.8 Technical team - capacity planning		

2.0 Customer Success	<u>REQUIREMENT: 10 points Customer Success Stories with (optional) Expertise</u>	Met (Yes/No)																								
<p>2.1 Google Cloud customer details</p> <p>Customer Success Stories must be approved before applying. Any applications received with Customer Success Stories in review will be declined.</p> <p>Refer to the Partner Expertise to Specialization mapping Document.</p> <p>Refer to the Customer Success section for more information and review the Customer Success Stories submission guide.</p>	<table border="1"> <thead> <tr> <th data-bbox="493 527 691 642">Case Study ID</th><th data-bbox="691 527 894 642">Expertise ID (optional)</th><th data-bbox="894 527 1097 642">Case Study name</th><th data-bbox="1097 527 1300 642">Link (optional)</th></tr> </thead> <tbody> <tr> <td data-bbox="493 642 691 774">Example: CS-12345</td><td data-bbox="691 642 894 774">Example: PE-123456</td><td data-bbox="894 642 1097 774"></td><td data-bbox="1097 642 1300 774"></td></tr> <tr> <td data-bbox="493 774 691 863"></td><td data-bbox="691 774 894 863"></td><td data-bbox="894 774 1097 863"></td><td data-bbox="1097 774 1300 863"></td></tr> <tr> <td data-bbox="493 863 691 951"></td><td data-bbox="691 863 894 951"></td><td data-bbox="894 863 1097 951"></td><td data-bbox="1097 863 1300 951"></td></tr> <tr> <td data-bbox="493 951 691 1039"></td><td data-bbox="691 951 894 1039"></td><td data-bbox="894 951 1097 1039"></td><td data-bbox="1097 951 1300 1039"></td></tr> <tr> <td data-bbox="493 1039 691 1127"></td><td data-bbox="691 1039 894 1127"></td><td data-bbox="894 1039 1097 1127"></td><td data-bbox="1097 1039 1300 1127"></td></tr> </tbody> </table> <p>NOTE: Expertise IDs may not be required for every Specialization, however, all IDs must be included in your application when utilized to achieve the 10-point requirement, or if the Expertise satisfies a Specialization checklist requirement.</p>	Case Study ID	Expertise ID (optional)	Case Study name	Link (optional)	Example: CS-12345	Example: PE-123456																			
Case Study ID	Expertise ID (optional)	Case Study name	Link (optional)																							
Example: CS-12345	Example: PE-123456																									

3.0 Capability Assessment	<p>Partners must submit the supporting detail for the following 3 demonstrations. For all submitted ML models, please show original code. Any submission that simply reuses Google published sample code will be rejected. Ideally the submitted code should be based on real customer engagements such as those highlighted in the customer success stories above. If for any reason you cannot share the customer's code, you can show an example from internal projects or any other case where a real ML model was developed. You are free to use publicly available data, but the submission has to show a full-fledged solution that includes feature engineering, selected algorithm and hyper-parameter tuning.</p>	
Demonstration 1	Evidence - Insert CS-XXXXX and document links	Met

		(Yes/No)
3.1.1.1 Code repository	Insert CS-XXXXX and document link here e.g., https://docs.google.com/document/d/xxxxx <i>Include page #</i>	
3.1.1.2 Code origin certification		
3.1.2.1 Dataset in Google Cloud		
3.1.3.1 Business goal and machine learning solution		
3.1.3.2 Data exploration		
3.1.3.3 Feature engineering		
3.1.3.4 Preprocessing and the data pipeline		
3.1.3.5 Machine learning model design(s) and selection		
3.1.3.6 Machine learning model training and development		
3.1.3.7 Machine learning model evaluation		
3.1.4.1 Model/application on Google Cloud		

3.1.4.2 Callable library/application		
3.1.4.3 Editable model/application		
Demonstration 2	Evidence - Insert CS-XXXXX and document links	
3.2.1.1 Code repository		
3.2.1.2 Code origin certification		
3.2.2.1 Dataset in Google Cloud		
3.2.3.1 Business goal and machine learning solution		
3.2.3.2 Data exploration		
3.2.3.3 Feature engineering		
3.2.3.4 Preprocessing and the data pipeline		
3.2.3.5 Machine learning model design(s) and selection		
3.2.3.6 Machine learning model training and development		
3.2.3.7 Machine learning model evaluation		
3.2.3.8 Fairness analysis		

3.2.4.1 Model/ application on Google Cloud		
3.2.4.2 Callable library/ application		
3.2.4.3 Editable model/ application		
Demonstration 3	Evidence - Insert CS-XXXXX and document links	
3.3.1.1 Code repository		
3.3.1.2 Code origin certification		
3.3.2.1 Dataset in Google Cloud		
3.3.3.1 Business goal and machine learning solution		
3.3.3.2 Data exploration		
3.3.3.3 Feature engineering		
3.3.3.4 Preprocessing and the data pipeline		
3.3.3.5 Machine learning model design(s) and selection		
3.3.3.6 Machine learning model training and development		
3.3.3.7 Machine learning model		

evaluation		
3.3.4.1 Model/ application on Google Cloud		
3.3.4.2 Callable library/ application		
3.3.4.3 Editable model/ application		

4.0 Responsible AI	Evidence	Met (Yes/ No)
4.1 Executive sponsorship for Responsible AI		
4.2 Training on Responsible AI		
4.3 Responsible AI reviews		

5.0 Security and Reliability	Evidence	Met (Yes/ No)
5.1 Security policies		
5.2 Availability and resilience		
5.3 Capacity planning		

6.0 Monitoring and Reporting	Evidence	Met (Yes/ No)
6.1 Monitoring systems /tools and reporting		

7.0 Optimization	Evidence	Met (Yes/ No)
7.1 Application optimization		
7.2 Cost optimization		