What is Document AI?

Think of Document AI as a super-smart assistant that can read and understand your documents quickly and accurately. This amazing feature from Snowflake uses a special technology called Arctic-TILT to pick out important information from all sorts of documents. Whether it's a long paragraph, a logo, or even a handwritten signature, Document AI can handle it all. It's perfect for organizing documents like invoices or financial statements into clear, easy-to-read tables.

Why Should You Care About Document AI?What is Document AI?

Smart Extraction: Document AI can find and extract the right information even from documents it has never seen before. This is called **zero-shot** extraction, and it works like magic for your data.

Customizable: You can train the model with your own documents to make it work even better for your specific needs. Plus, this custom model is private and won't be shared with anyone else.

When to Use Document AI

Organize Your Data: *T*urn messy, unstructured data from documents into neat tables.

Automate Your Work: Set up continuous processing for new documents of the same type.

Team Collaboration: Business experts can set up the model, while data engineers create pipelines using SQL for ongoing document processing.

How Does Document AI Work?

Easy-to-Use Interface: Create, test, and improve your Document AI model with ease.

Model Build: This represents a specific type of document or use case, like extracting details from invoices. It includes the model, the data to be pulled out, and documents to train and test the model.

Extracting Query: Use a simple query to pull information from documents and set up continuous processing with streams and tasks.

Want to know more? Dive into how **Document AI** can transform the way you handle documents and make your work life much easier!

Create a document processing pipeline with Document AI

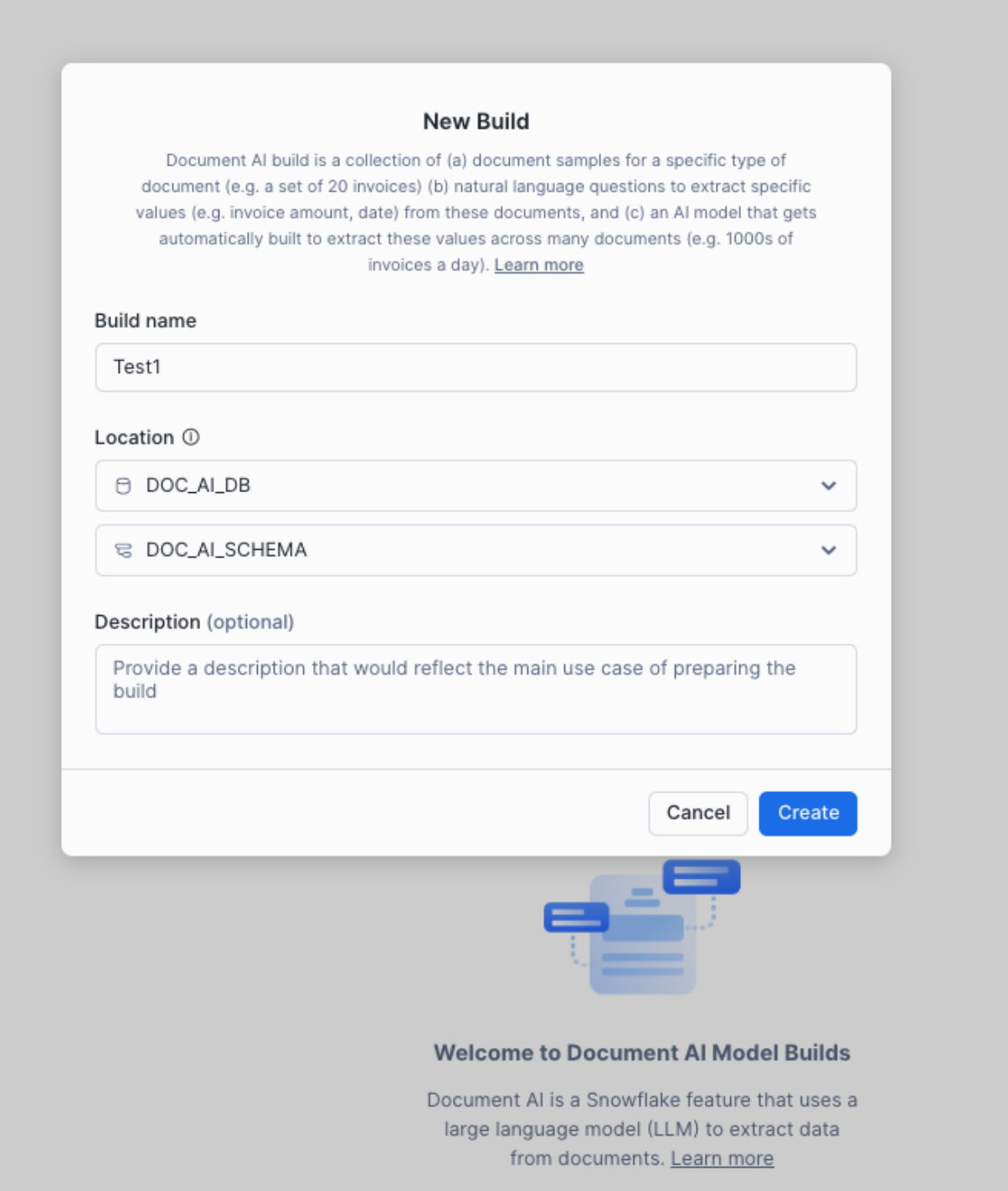
- Setup the required objects and privilages

```
--Create a database and schema in which to create a Document AI model build:
CREATE DATABASE doc_ai_db;
CREATE SCHEMA doc_ai_db.doc_ai_schema;

--Create custom role doc_ai_role

USE ROLE ACCOUNTADMIN;
```

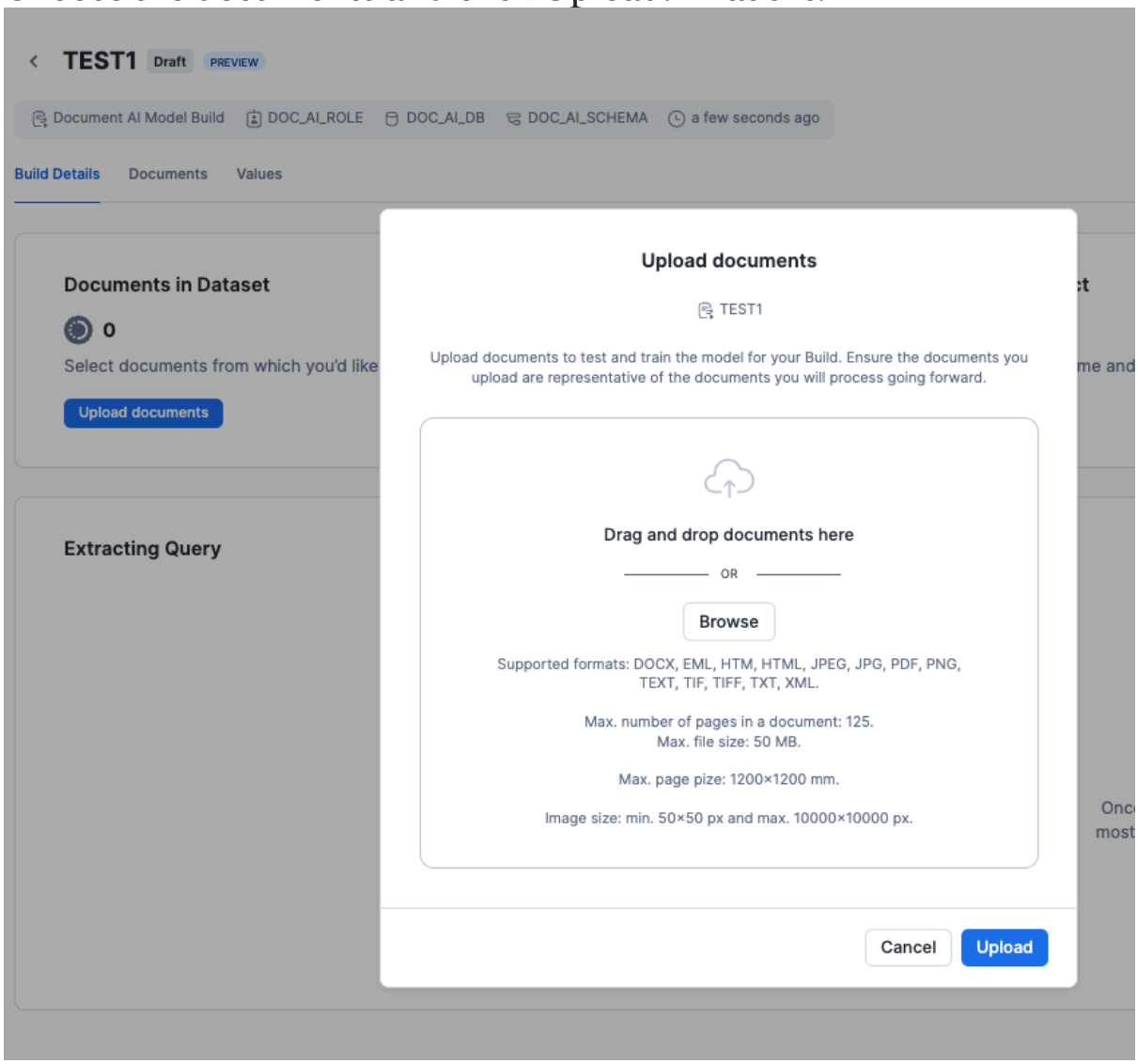
```
CREATE ROLE doc_ai_role;
--Grant the SNOWFLAKE.DOCUMENT_INTELLIGENCE_CREATOR database role to the doc_ai_role role:

    GRANT DATABASE ROLE SNOWFLAKE.DOCUMENT_INTELLIGENCE_CREATOR TO ROLE doc_ai_role;

--Grant warehouse usage and operating privileges to the doc_ai_role role:

    GRANT USAGE, OPERATE ON WAREHOUSE <your_warehouse> TO ROLE doc_ai_role;

--Grant the privileges to use the database and schema you created to the doc_ai_role:

    GRANT USAGE ON DATABASE doc_ai_db TO ROLE doc_ai_role;
    GRANT USAGE ON SCHEMA doc_ai_db.doc_ai_schema TO ROLE doc_ai_role;

--Grant the create stage privilege on the schema to the doc_ai_role role to store the documents for extraction:

    GRANT CREATE STAGE ON SCHEMA doc_ai_db.doc_ai_schema TO ROLE doc_ai_role;

--Grant the privilege to create model builds (instances of the DOCUMENT_INTELLIGENCE class) to the doc_ai_role role:

    GRANT CREATE SNOWFLAKE.ML.DOCUMENT_INTELLIGENCE ON SCHEMA doc_ai_db.doc_ai_schema TO ROLE doc_ai_role;

--Grant the privileges required to create a processing pipeline using streams and tasks to the doc_ai_role role:

    GRANT CREATE STREAM, CREATE TABLE, CREATE TASK, CREATE VIEW ON SCHEMA doc_ai_db.doc_ai_schema TO ROLE doc_ai_role;
    GRANT EXECUTE TASK ON ACCOUNT TO ROLE doc_ai_role;

--Grant the doc_ai_role to tutorial user for use in the next steps of the tutorial:

    GRANT ROLE doc_ai_role TO USER <your_user_name>;
```

- Prepare a Document AI model build

- Create a Document AI model build.
- Upload documents to test the Document AI model build.



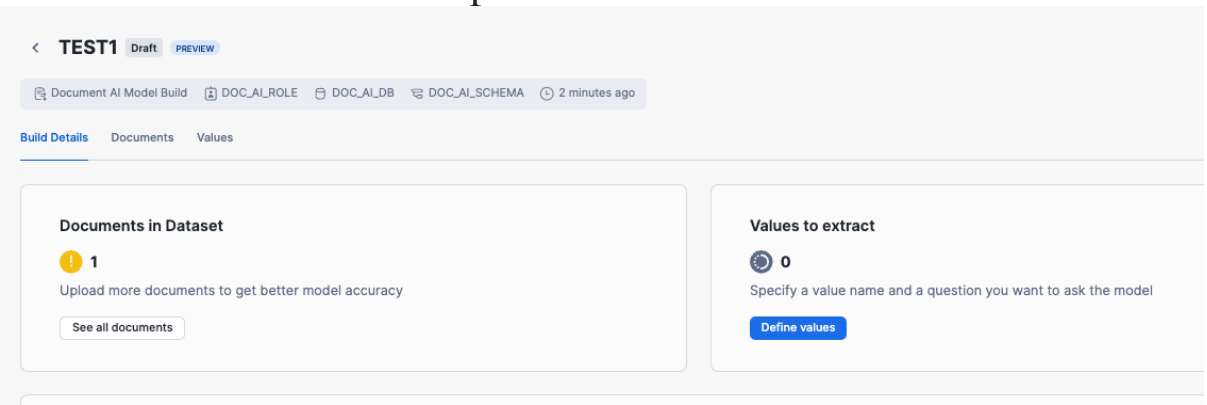
To create a Document AI model build, sign in to Snowsight, go to AI & ML » Document AI, choose a warehouse, and click + Build. Name your model build and select the location, then hit Create. To upload documents to this model, download the necessary files, unzip them, and in the model build's Build Details tab, select Upload documents. Choose the documents and click Upload. That's it!



- Define data values and review the results

- Define data values to extract by asking the model questions in natural language.

- Review results by confirming or correcting the answers that the model provided



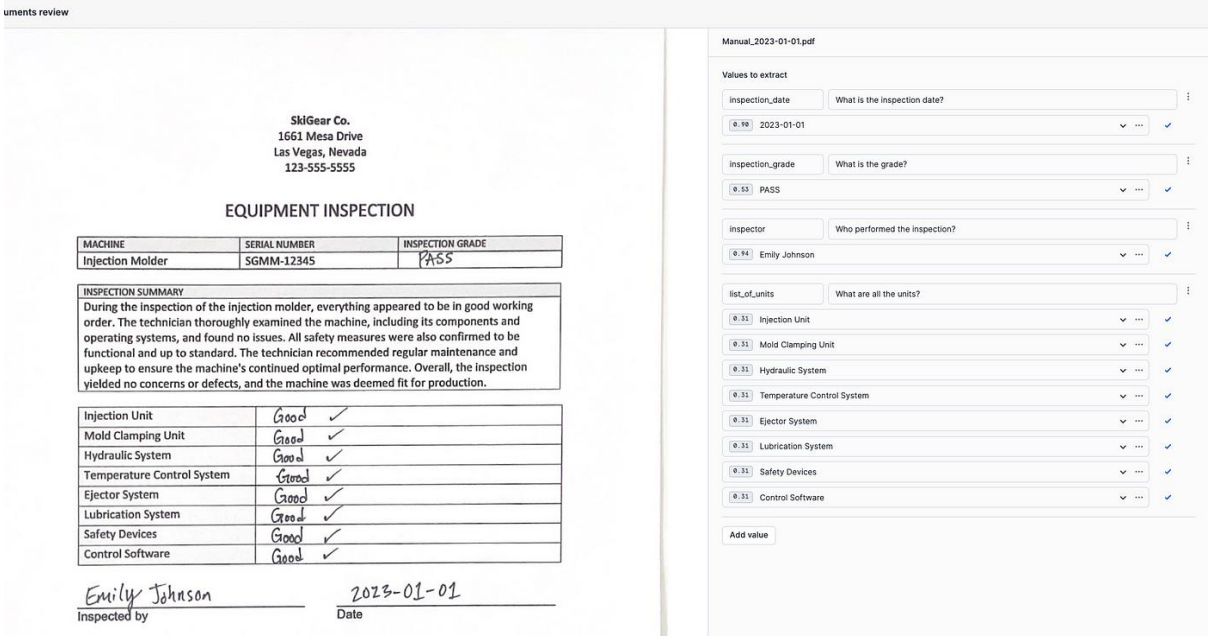
To define values for the Document AI model build:

1. In the TEST1 model build, select the **Build Details** tab.
2. Select **Define values**.
3. In the **Documents review** view, select **+ Value**.
4. For each document, enter the following pairs of value names and questions:

- `inspection_date`: What is the inspection date?
- `inspection_grade`: What is the grade?
- `inspector`: Who performed the inspection?
- `list_of_units`: What are all the units?

5. For each document and data value, review the answers that the model provides:

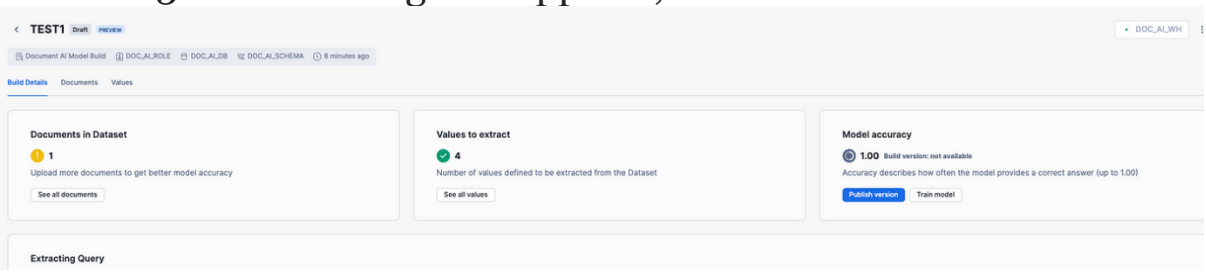
- If the answer is correct, select the checkmark.
- If the answer is incorrect, enter the correct value manually.

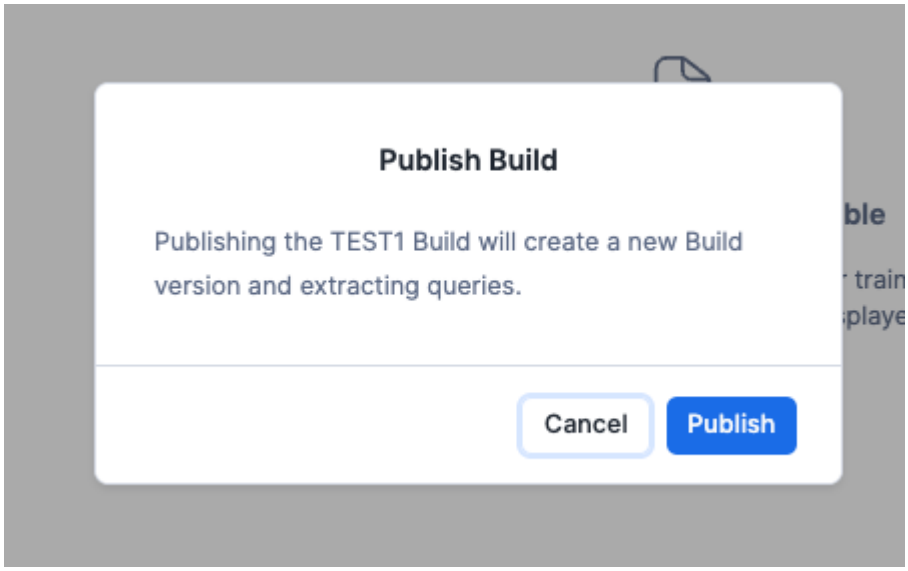


- Publish a Document AI model build

To publish the model build, do the following:

1. In the `TEST1` model build, select the **Build Details** tab.
2. Under **Model accuracy**, select **Publish version**.
3. In the dialog that appears, select **Publish** to confirm.





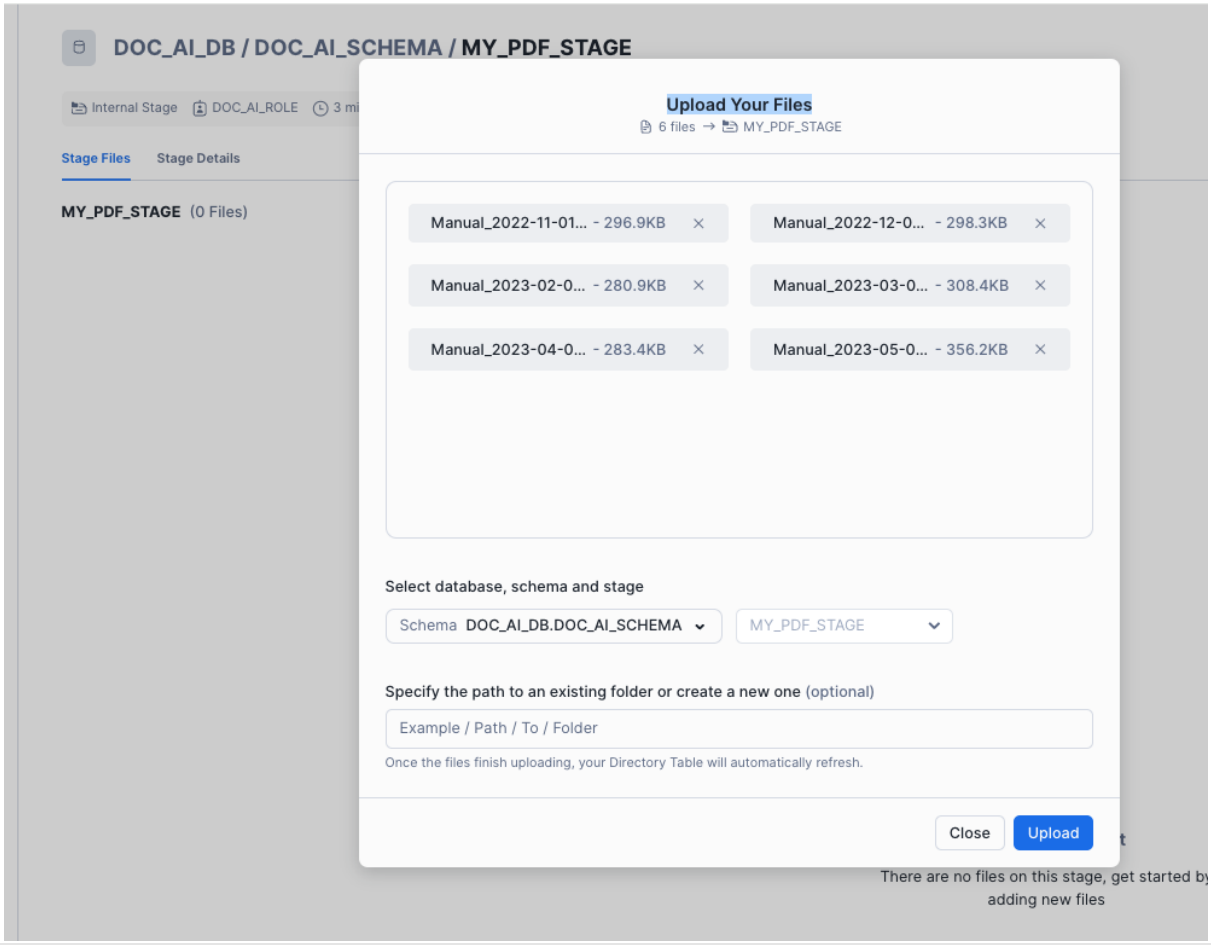
- Create a document processing pipeline

- Set up the pipeline using streams and tasks.
- Upload new documents to an internal stage.
- View the extracted information.

```
--Create an internal my_pdf_stage stage to store the documents:
    CREATE OR REPLACE STAGE my_pdf_stage DIRECTORY = (ENABLE = TRUE)

    ENCRYPTION = (TYPE = 'SNOWFLAKE_SSE');


--Create a my_pdf_stream stream on a my_pdf_stage stage:
    CREATE STREAM my_pdf_stream ON STAGE my_pdf_stage;


--Refresh
    ALTER STAGE my_pdf_stage REFRESH;


--Specify the database and schema:

    USE DATABASE doc_ai_db;

    USE SCHEMA doc_ai_schema;


--Create a pdf_reviews table to store the information
    CREATE OR REPLACE TABLE pdf_reviews (
     file_name VARCHAR,
     file_size VARIANT,
```

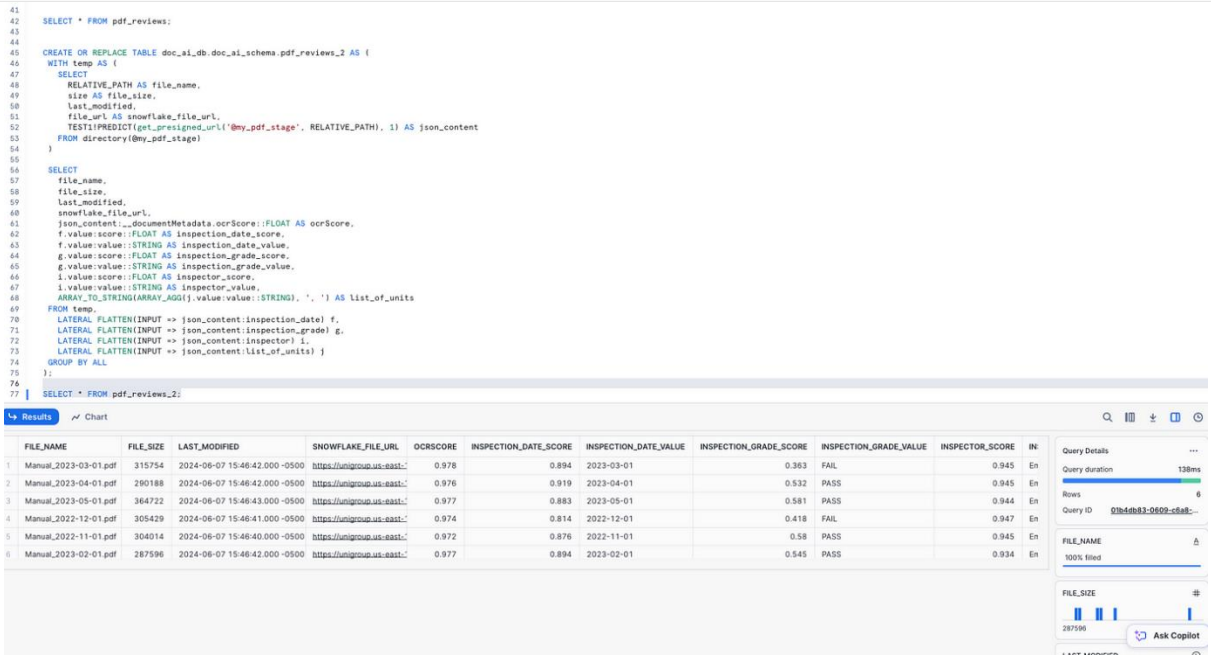
```
     last_modified VARCHAR,
     snowflake_file_url VARCHAR,
     json_content VARCHAR
    );


--Create a load_new_file_data task to process new documents in the stage
    CREATE OR REPLACE TASK load_new_file_data
     WAREHOUSE = doc_ai_wh
    SCHEDULE = '1 minute'
      COMMENT = 'Process new files in the stage and insert data into the
pdf_reviews table.'
    WHEN SYSTEM$STREAM_HAS_DATA('my_pdf_stream')
    AS
    INSERT INTO pdf_reviews (
     SELECT
     RELATIVE_PATH AS file_name,
     size AS file_size,
     last_modified,
     file_url AS snowflake_file_url,
     TEST1!PREDICT(GET_PRESIGNED_URL('@my_pdf_stage', RELATIVE_PATH), 1)
AS json_content
    FROM my_pdf_stream
     WHERE METADATA$ACTION = 'INSERT'
    );


--Start the newly created task:
ALTER TASK load_new_file_data RESUME;
```

To upload new documents, first, download the zip files with the needed documents to your computer. Then, unzip the files, which are in PDF format. In Snowsight, go to Data » Databases. Choose the doc_ai_db database, the doc_ai_schema, and the my_pdf_stage stage. Click on + Files, then select the files you downloaded. Finally, click Upload. That's it! Your documents are now uploaded and ready to use.




```
--After uploading the documents to the stage, view the information
extracted
    SELECT * FROM pdf_reviews;

--Create a pdf_reviews_2 table to analyze the extracted information in
separate columns:

CREATE OR REPLACE TABLE doc_ai_db.doc_ai_schema.pdf_reviews_2 AS (
 WITH temp AS (
   SELECT
     RELATIVE_PATH AS file_name,
     size AS file_size,
     last_modified,
     file_url AS snowflake_file_url,
     TEST1!PREDICT(get_presigned_url('@my_pdf_stage', RELATIVE_PATH), 1)
AS json_content
   FROM directory(@my_pdf_stage)
 )

 SELECT
   file_name,
   file_size,
   last_modified,
   snowflake_file_url,
   json_content:__documentMetadata.ocrScore::FLOAT AS ocrScore,
   f.value:score::FLOAT AS inspection_date_score,
```

```
    f.value:value::STRING AS inspection_date_value,
    g.value:score::FLOAT AS inspection_grade_score,
    g.value:value::STRING AS inspection_grade_value,
    i.value:score::FLOAT AS inspector_score,
    i.value:value::STRING AS inspector_value,
    ARRAY_TO_STRING(ARRAY_AGG(j.value:value::STRING), ', ') AS
list_of_units
 FROM temp,
    LATERAL FLATTEN(INPUT => json_content:inspection_date) f,
    LATERAL FLATTEN(INPUT => json_content:inspection_grade) g,
    LATERAL FLATTEN(INPUT => json_content:inspector) i,
    LATERAL FLATTEN(INPUT => json_content:list_of_units) j
 GROUP BY ALL
);

--View the output:
     SELECT * FROM pdf_reviews_2;
```



	FILE_NAME	FILE_SIZE	LAST_MODIFIED	SNOWFLAKE_FILE_URL	OCRSCORE	INSPECTION_DATE_SCORE	INSPECTION_DATE_VALUE	INSPECTION_GRADE_SCORE	INSPECTION_GRADE_VALUE	INSPECTOR_SCORE	IN:
1	Manual_2023-03-01.pdf	315754	2024-06-07 15:46:42.000 -0500	https://unigroup.us-east-'	0.978	0.894	2023-03-01	0.363	FAIL	0.945	En
2	Manual_2023-04-01.pdf	290188	2024-06-07 15:46:42.000 -0500	https://unigroup.us-east-'	0.976	0.919	2023-04-01	0.532	PASS	0.945	En
3	Manual_2023-05-01.pdf	364722	2024-06-07 15:46:43.000 -0500	https://unigroup.us-east-'	0.977	0.883	2023-05-01	0.581	PASS	0.944	En
4	Manual_2022-12-01.pdf	305429	2024-06-07 15:46:41.000 -0500	https://unigroup.us-east-'	0.974	0.814	2022-12-01	0.418	FAIL	0.947	En
5	Manual_2022-11-01.pdf	304014	2024-06-07 15:46:40.000 -0500	https://unigroup.us-east-'	0.972	0.876	2022-11-01	0.58	PASS	0.945	En
6	Manual_2023-02-01.pdf	287596	2024-06-07 15:46:42.000 -0500	https://unigroup.us-east-'	0.977	0.894	2023-02-01	0.545	PASS	0.934	En

You've learned to set up a place to keep your documents safe, created steps to organize them effectively, and easily uploaded them for processing. Plus, you could see all the important details neatly arranged in a table. Now, you're all set to manage your documents smoothly, making your work life a whole lot easier!

https://docs.snowflake.com/en/user-guide/snowflake-cortex/document-ai/tutorials/create-processing-pipelines#introduction