IBM PROJECT

PREDICTIVE MAINTENANCE OF INDUSTRIAL MACHINERY

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OUTLINE

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- IBM Certifications

PROBLEM STATEMENT

Develop a predictive maintenance model for a fleet of industrial machines to anticipate failures before they occur. This project will involve analyzing sensor data from machinery to identify patterns that precede a failure. The goal is to create a classification model that can predict the type of failure (e.g., tool wear, heat dissipation, power failure) based on real-time operational data. This will enable proactive maintenance, reducing downtime and operational costs

TECHNOLOGY USED

IBM cloud lite services

IBM Cloud AutoAI

IBM CLOUD SERVICES USED

- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Agent Lab

WOW FACTORS

This model helps industrial stakeholders make faster, more informed maintenance decisions by identifying the type of failure in machinery early. It reduces diagnostic time, enables proactive planning, and increases machine availability.

Unique features:

Failure Type Detection:Classifies issues like tool wear,power failure,etc.

Cloud-Based:Scalable deployment on IBM Cloud.

Low-Code Workflow: Built using Watsonx AI Studio’s visual tools.

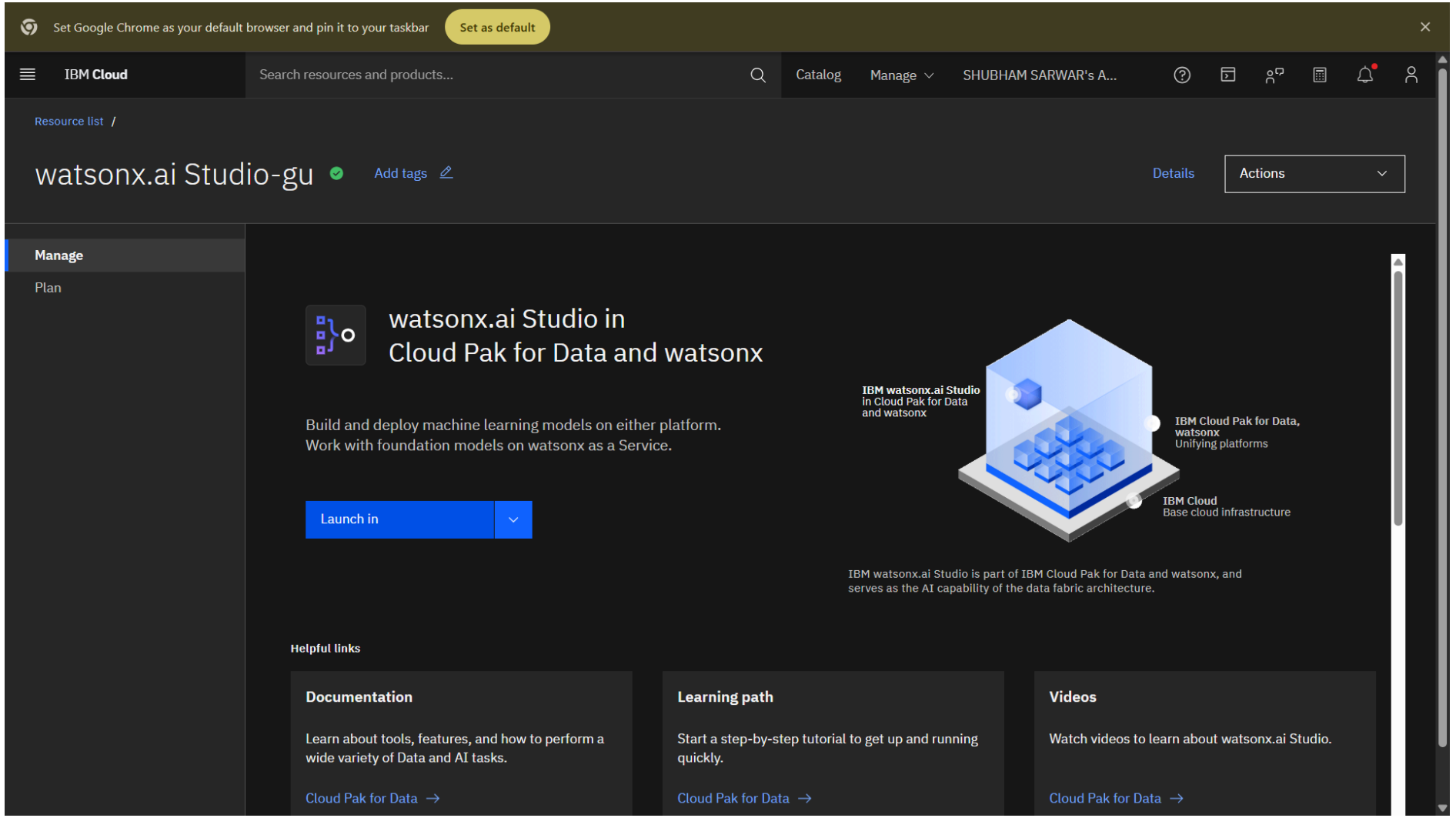
Real-Time Ready: can be linked to live sensor streams.

Modular Design: Easily extendable to more failure types or tools.

END USERS

- Maintenance Teams
- Operations Managers
- Manufacturing Engineers
- OEMs (Original Equipment Manufacturers)

SETTING UP



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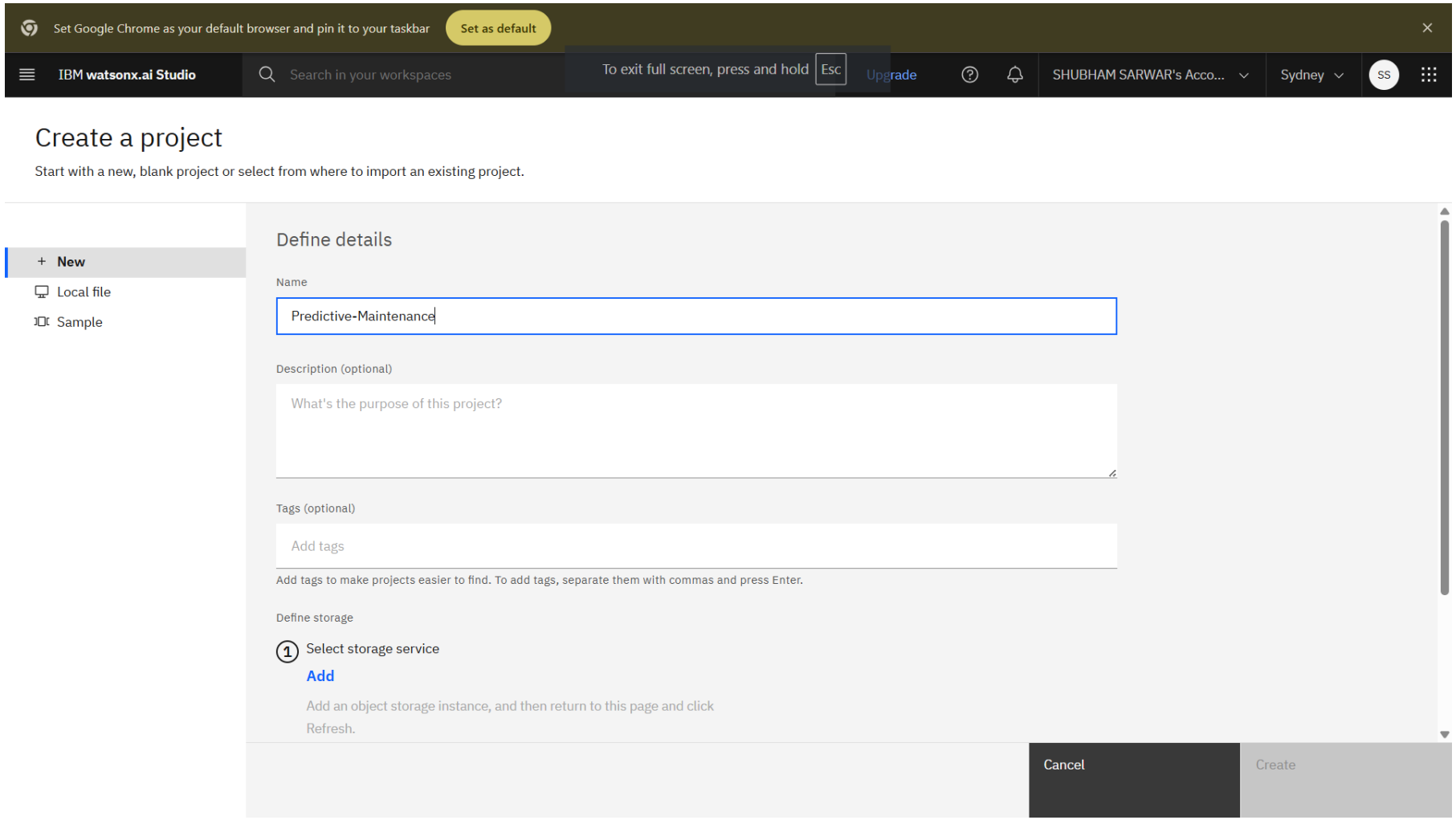
CREATING A PROJECT



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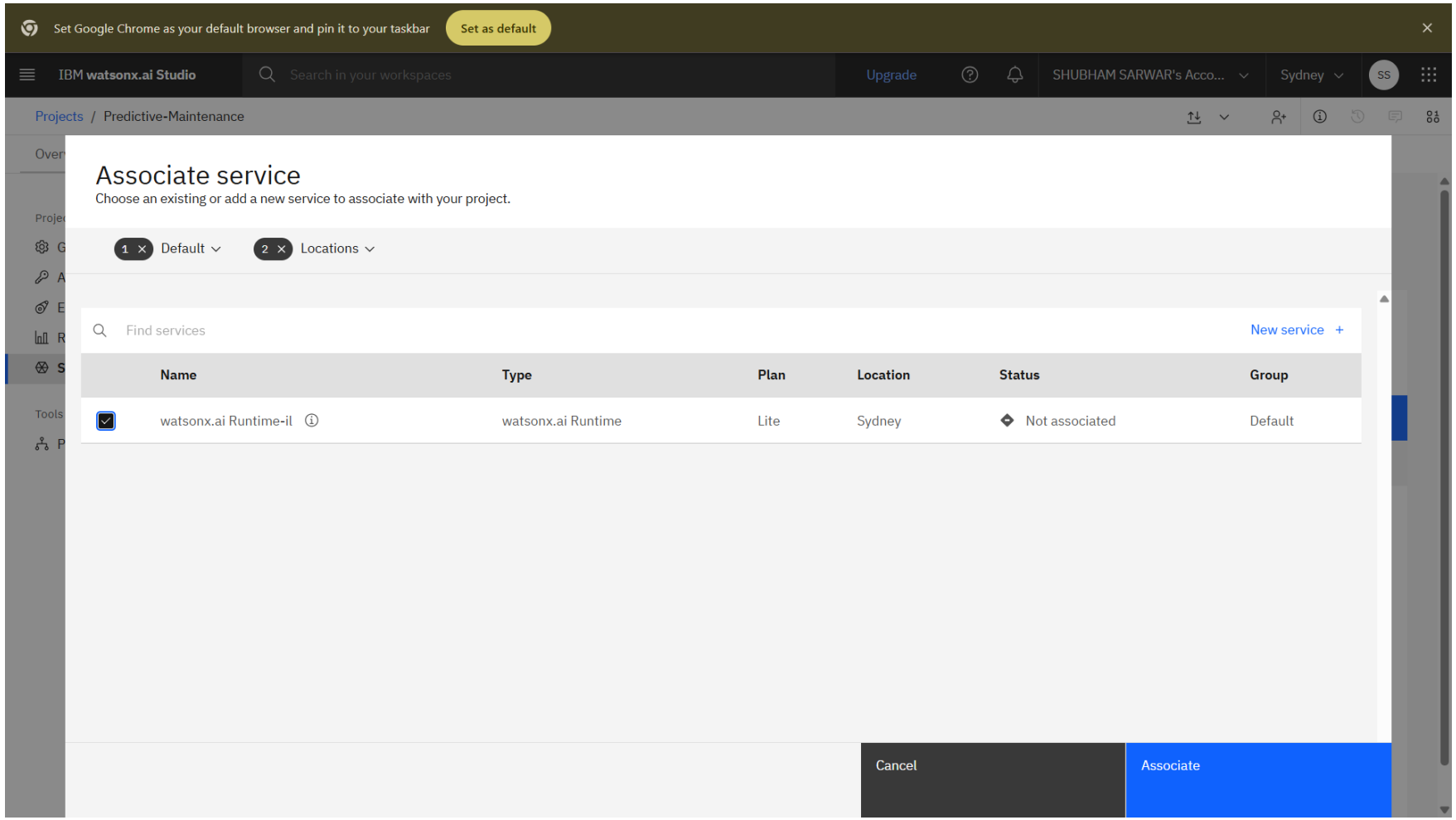
ASSOCIATING SERVICES



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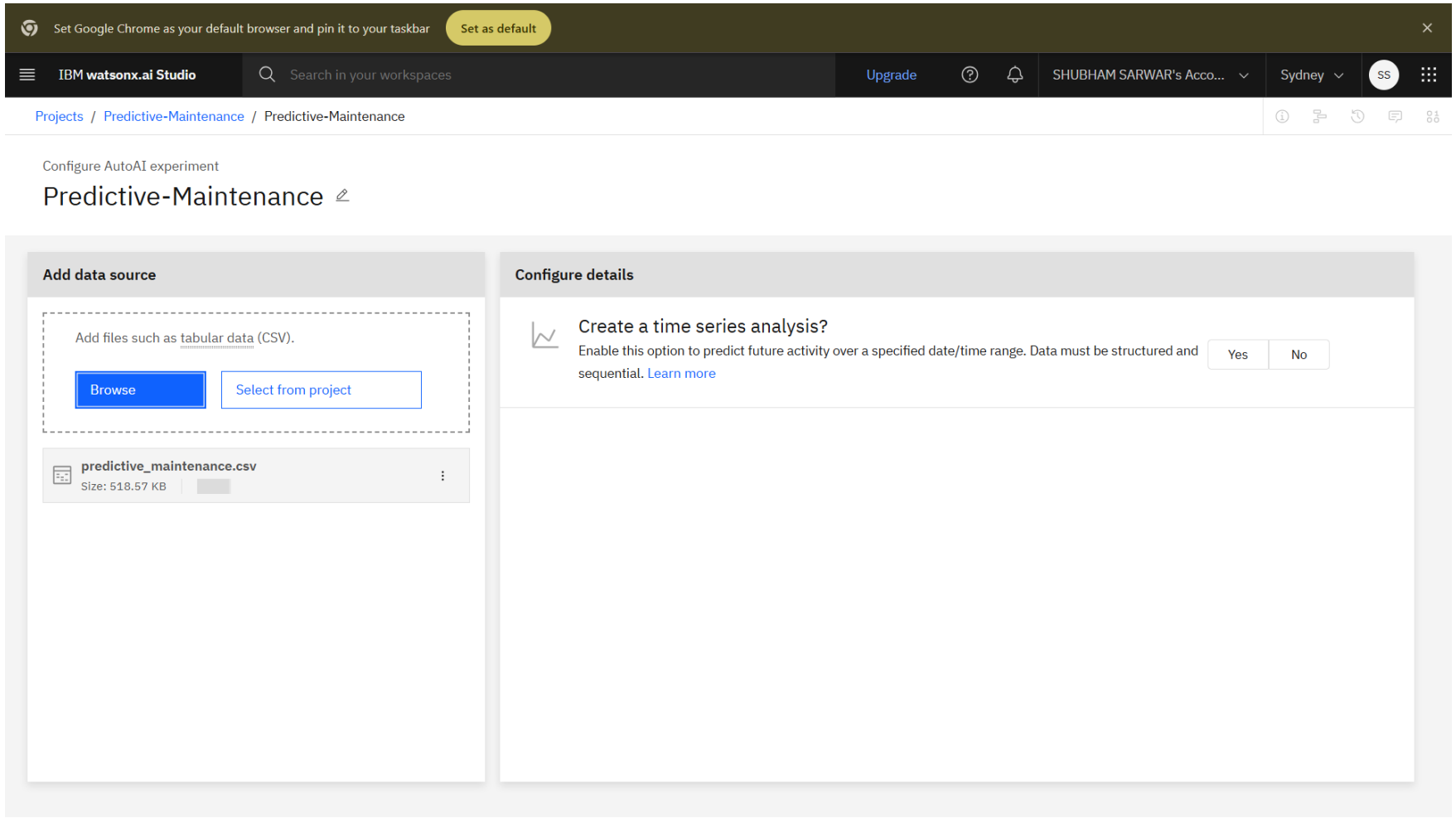
DATA SOURCE



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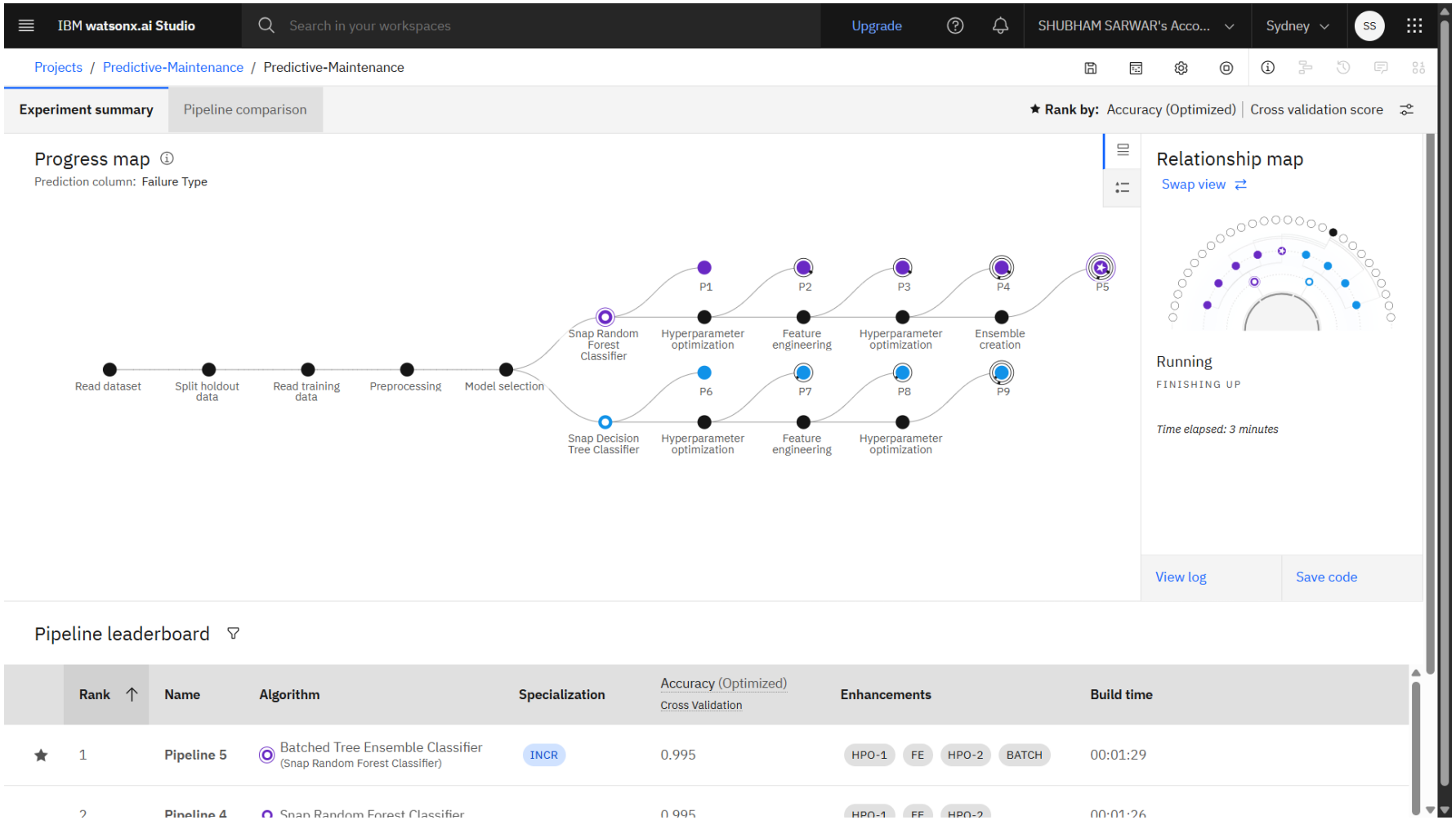
SELECTING MODEL



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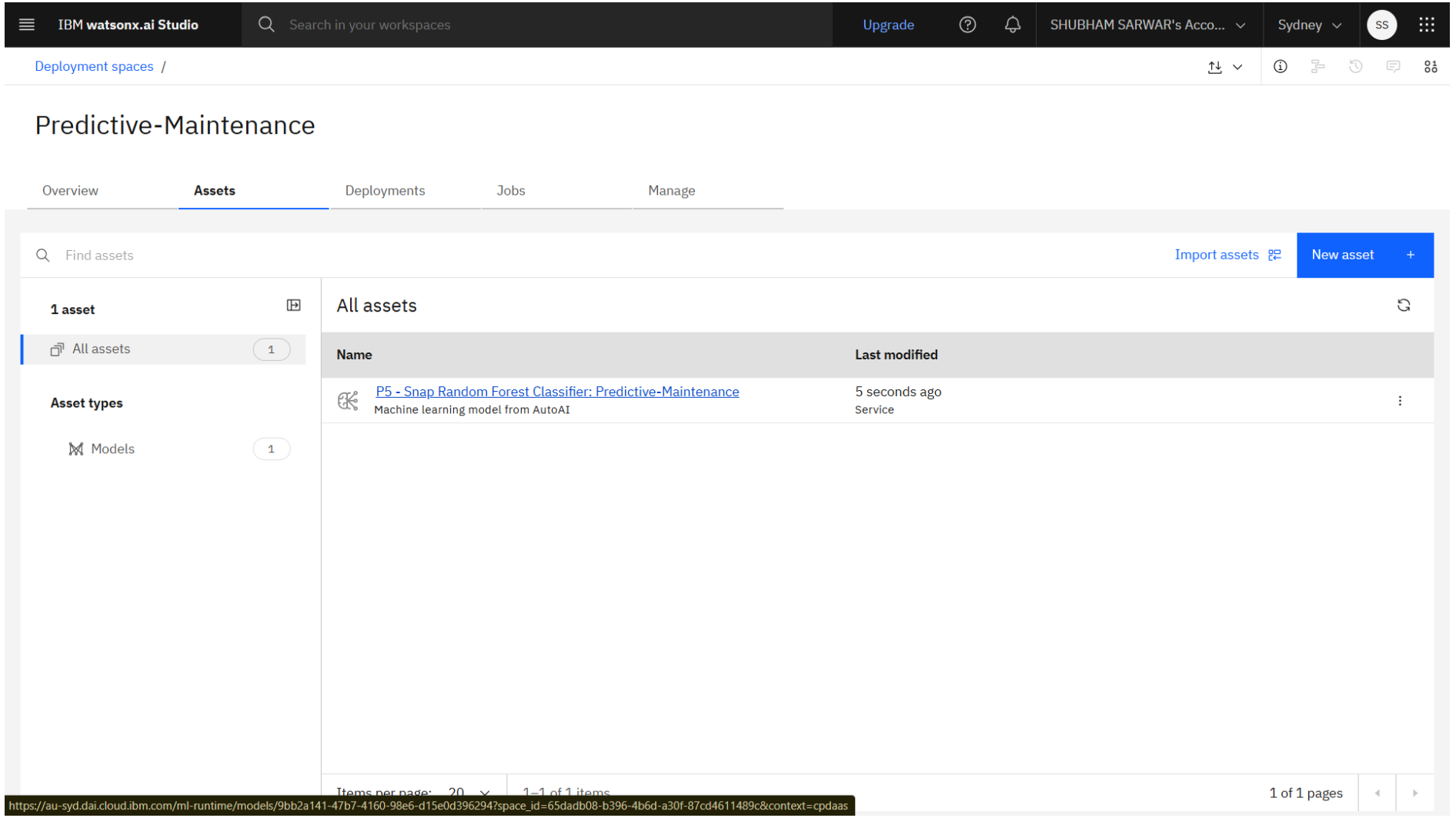
DEPLOYMENT



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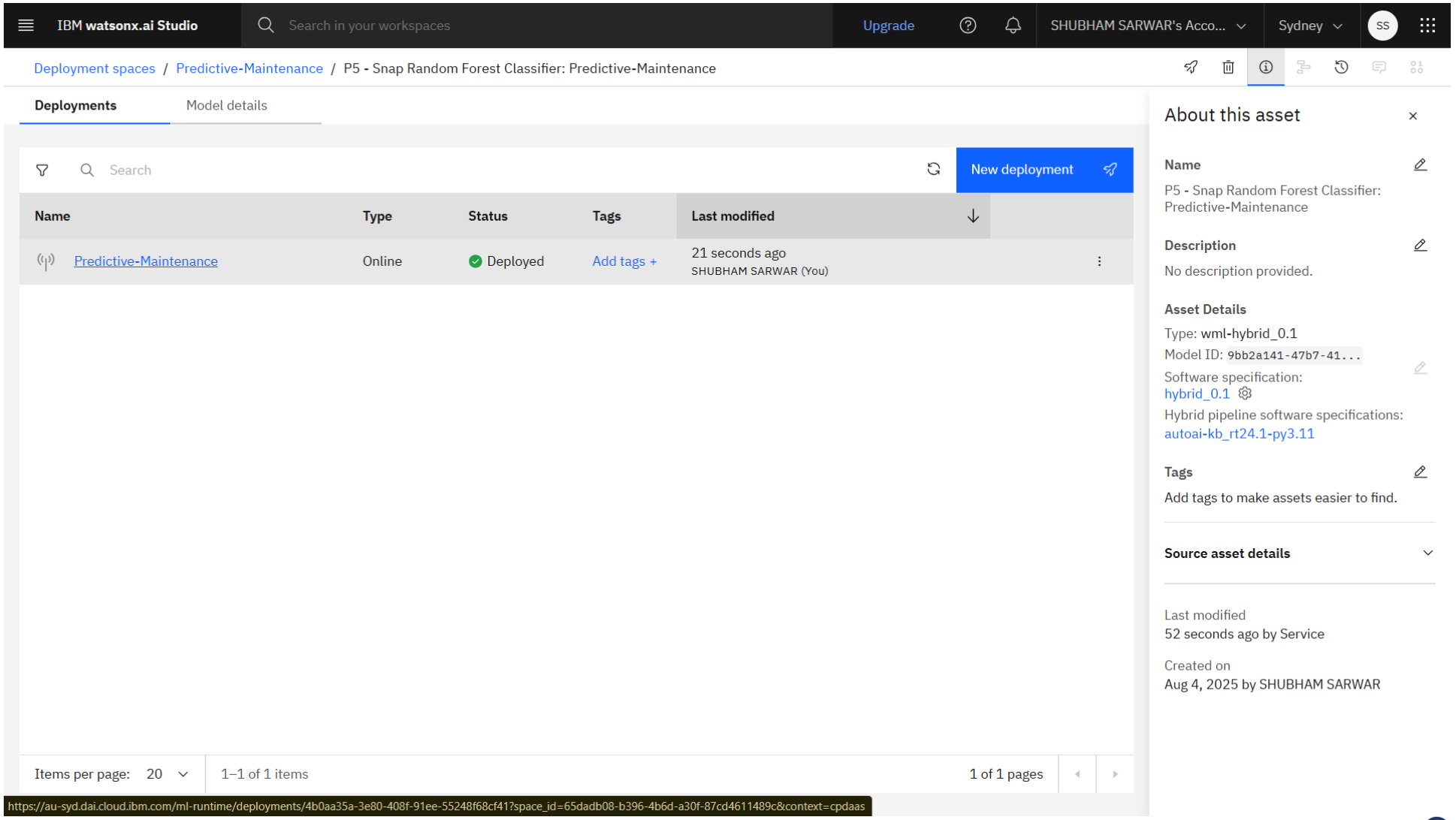
RESULTS



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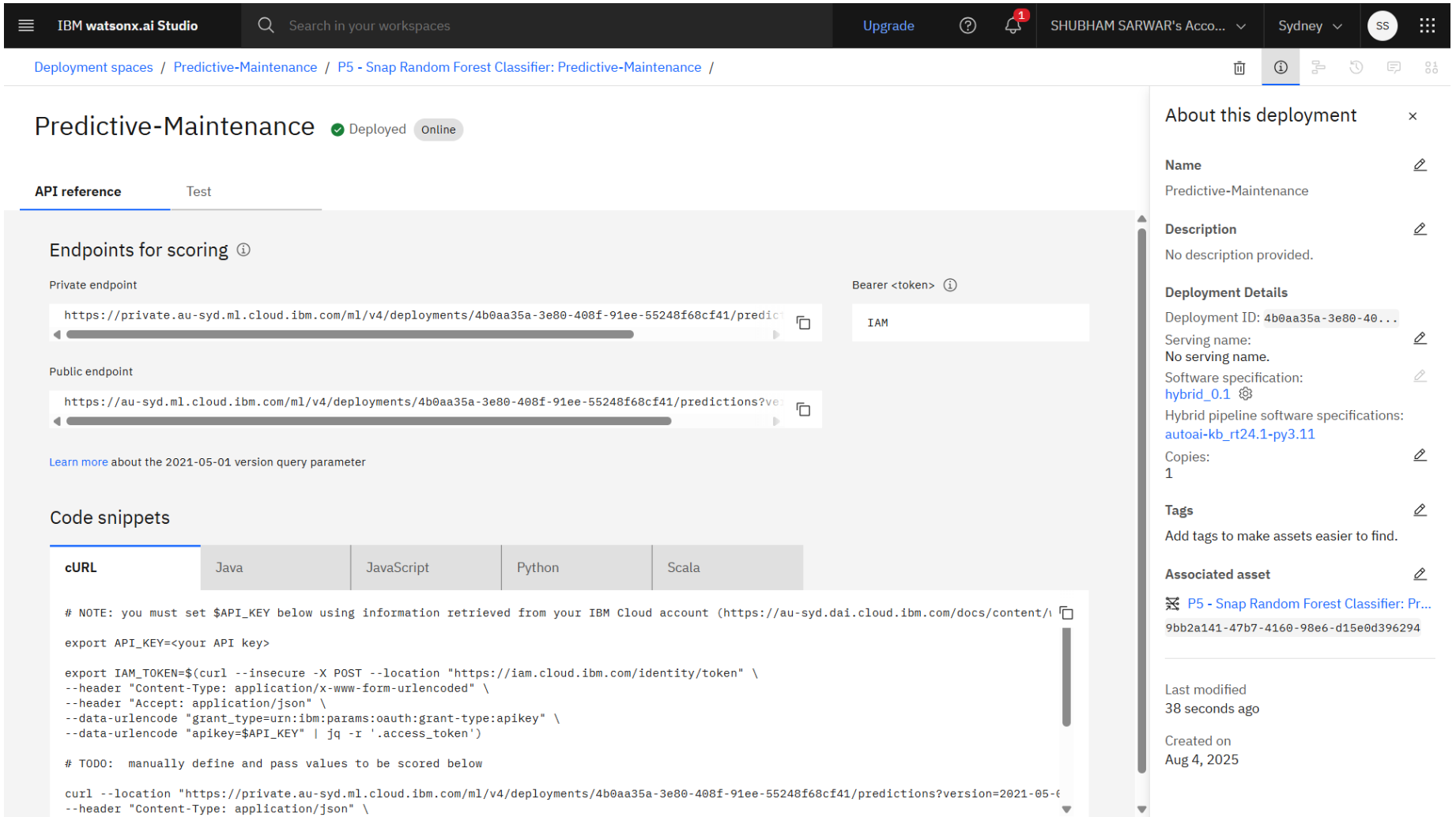
API REFERENCES



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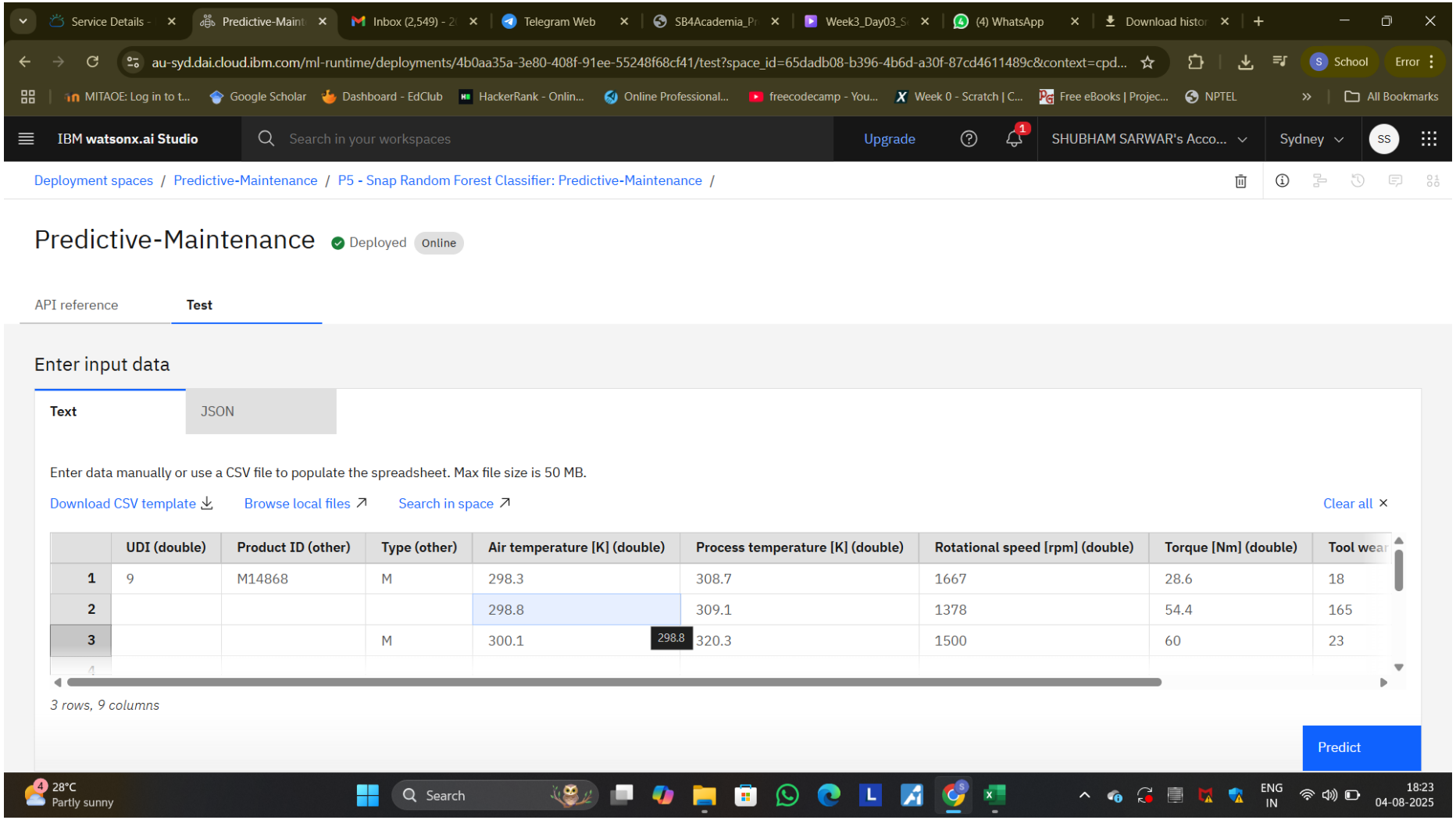
TESTING



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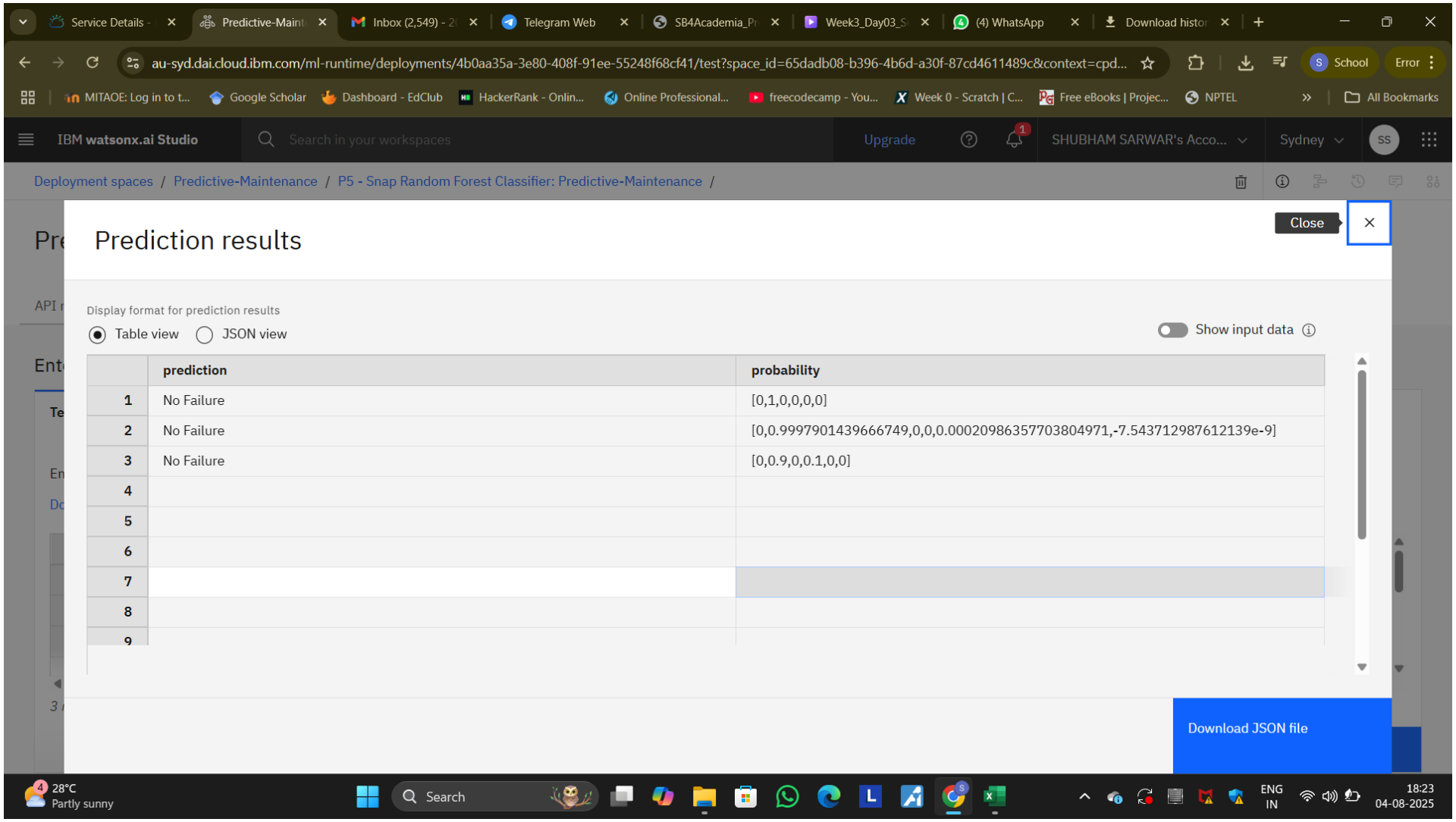
RESULTS


IBM watsonx.ai Studio
Deployment spaces / Predictive-Maintenance / P5 - Snap Random Forest Classifier: Predictive-Maintenance /
Prediction results
Close
Display format for prediction results
Table view
JSON view
Show input data
prediction
probability
1 No Failure [0,1,0,0,0,0]
2 No Failure [0,0.9997901439666749,0,0,0.00020986357703804971,-7.543712987612139e-9]
3 No Failure [0,0.9,0,0.1,0,0]
Download JSON file

CONCLUSION

- Developed a **classification model** to predict the **type of machine failure**, using historical sensor data.
- Implemented and trained the model with **IBM Cloud AutoAI**, requiring minimal manual tuning.
- Used **Watsonx AI Studio**, **AI Runtime**, and **Agent Lab** to manage, run, and deploy the solution on IBM Cloud Lite.
- The model helps **identify what kind of maintenance is needed**, enabling quicker fault resolution.

FUTURE SCOPE

- Multi-Label Classification
- Time Series Support
- Model Retraining
- Integration with IoT
- Broader Failure Taxonomy

IBM CERTIFICATIONS

IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence

Journey to Cloud: Envisioning Your Solution

IBM

SHUBHAM SARWAR

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution

Issued on: Jul 18, 2025
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IBM

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Shubham Sarwar

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 18 Jul 2025 (GMT)

Learning hours: 20 mins

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GITHUB LINK

GitHub Link:https://github.com/ShubhamSarwar/Predictive-Maintenance-of-Industrial-Machinery.git

THANK YOU

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