TECHORAMA

From Oops to Ops
Incident Response with Notebooks

T

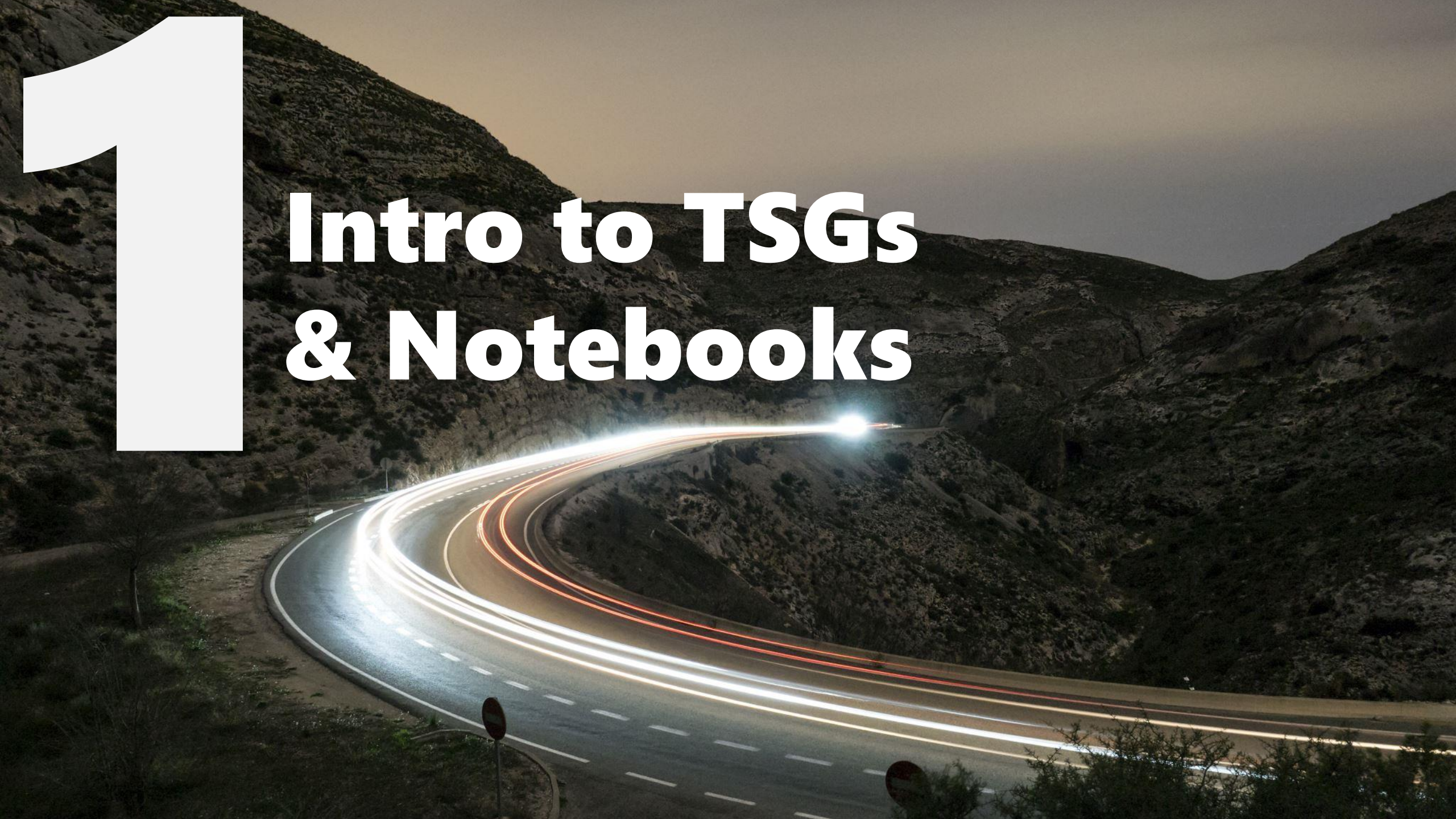
Julie Koesmarno (@MsSQLGirl)
Program Manager, Microsoft
jukoesma@microsoft.com

Shafiq Rahman
Engineering Manager, Microsoft
Shafiq.Rahman@microsoft.com

Our learning journey today

1. Intro to TSG & Notebooks
2. Executable TSGs with Notebooks
3. Jumpstart your TSG notebooks
4. Automatable TSGs with Notebooks
5. Takeaways and Other Resources

https://bit.ly/3ow3wmM


1
Intro to TSGs
& Notebooks

"TSG"

TSG = Troubleshooting Guide
SOP = Standard Operating Procedure

Playbook = steps to identify issues
Runbook = procedures to achieve specific outcome

KB = Knowledge Base

Before you run ~

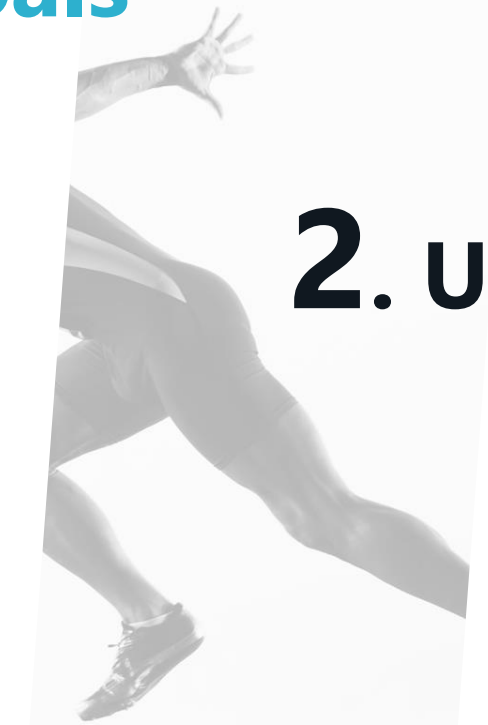
(sharing lessons learned)

Don’t forget …

change agent process

1. Know your goals

2. Understand the gaps



3. Plan it!

Demo

Notebooks in Azure Data Studio
created by community

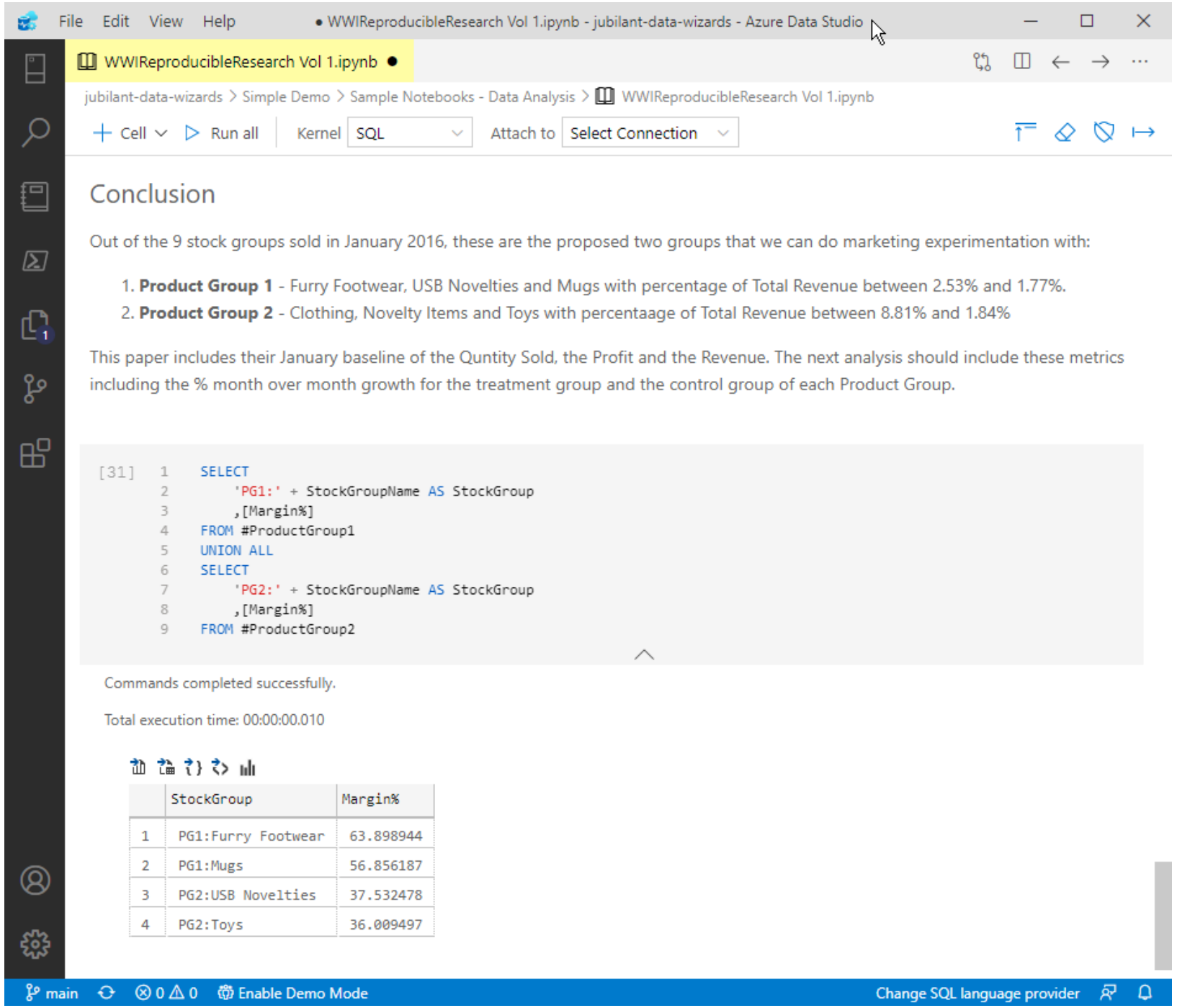
Notebooks

Text cells

Code cells

- SQL
- PowerShell
- Python
- **KQL**
- *.NET interactive*

Jupyter Book



Azure Data Studio

Modern data experiences, multi data-platforms

SQL: SQL Server, PostgreSQL, Azure SQL Edge, Azure SQL*

KQL: Azure Data Explorer

Environment: On-premises, poly-cloud

Client tool on multi-platforms: Windows, Linux, macOS

Extensible tool

Git support

Jupyter Notebook experiences

... and more ...


2
Executable TSGs
(From Oops to Ops)

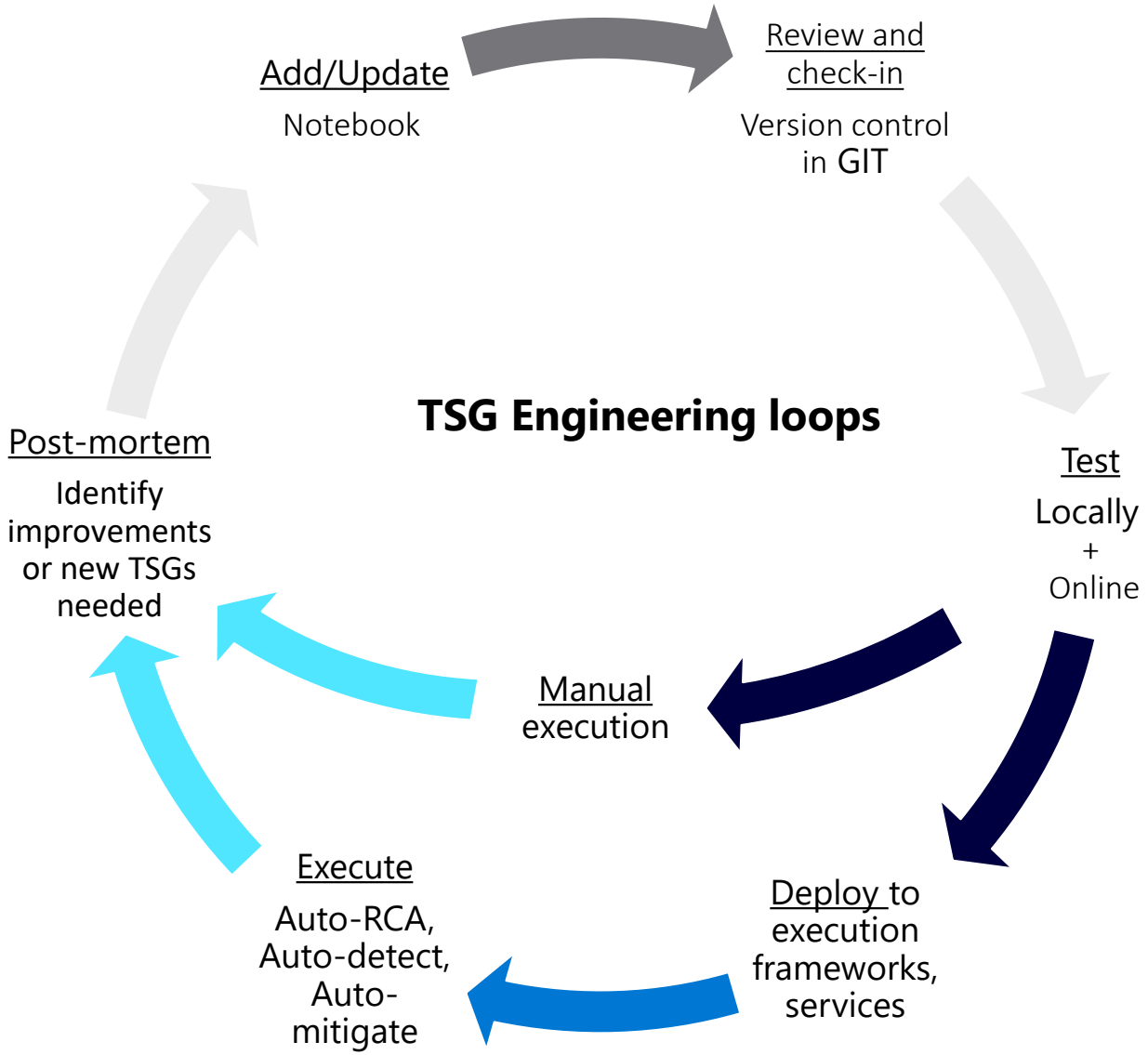
Troubleshooting Guides in the closet!

Challenges:

1. Static text in OneNote / wiki resulting in copy and paste
2. Discoverability - siloed TSG scripts
3. No version control to keep track quality
4. Sharing code and results with context is hard to do with OneNote or text files
5. Hard to crowd source code
6. Hard to search
7. Reusability

Notebooks as TSGs

- Bring engineering discipline to Livesite content
- Notebooks can be checked into GIT repos to provide version control
- Review, test, deploy, similar to code
- A simple system, with flexibility to create once and use everywhere
- Notebooks can be shared easily
- Notebooks inherently record every step executed with results/failures
- A repeatable environment for debugging and investigation



Demo

Parameterization


3
Jumpstart your
TSG Notebooks

Jump start to Notebooks!

Bulk conversions -

- SQL Scripts to Notebooks with ConvertTo-SqlNoteBook
- PowerShell scripts to Notebooks with ConvertTo-PowerShellNotebook

Demo: **https://youtu.be/80L-UTOlknw?t=1627**

Individual conversions -

- Export as Notebook UI in Azure Data Studio from a SQL Script
- PowerShell history to a Notebook

  Get-History 7,14 | % comm* | Export-AsPowerShellNotebook -OutputNotebook d:\temp\testthis.ipynb


4
Automatable TSGs
(Lesser Oops, More Ops)


time to mitigate
incident response efficiency?
number of incidents?
time to respond
How does your team measure incident response today?
DBA Happiness?

5 incident response maturity levels

Start here ...

level 1 — Adhoc scripts

level 2 — Manual documents (OneNote, Word, etc)

level 3 — Reusable scripts

level 4 — Executable Notebooks

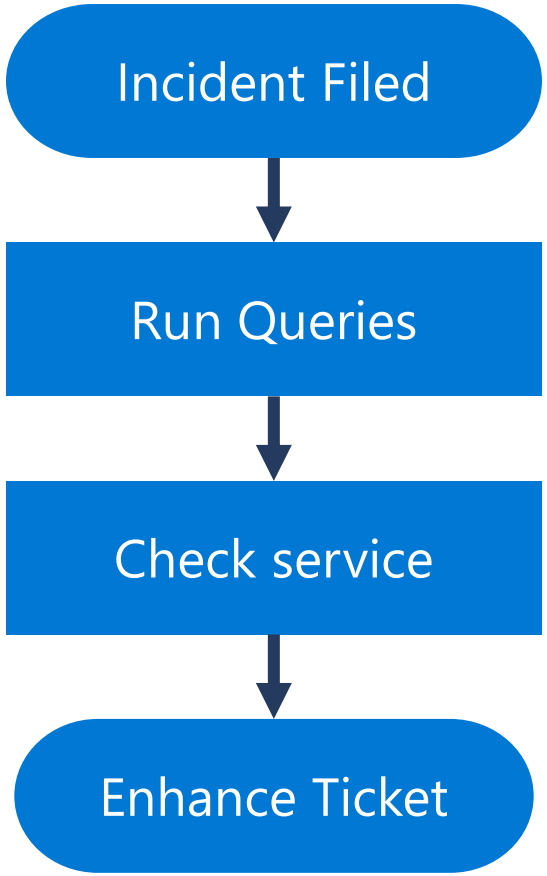
level 5 — Automatable Notebooks

scalability
maintainability

Automation

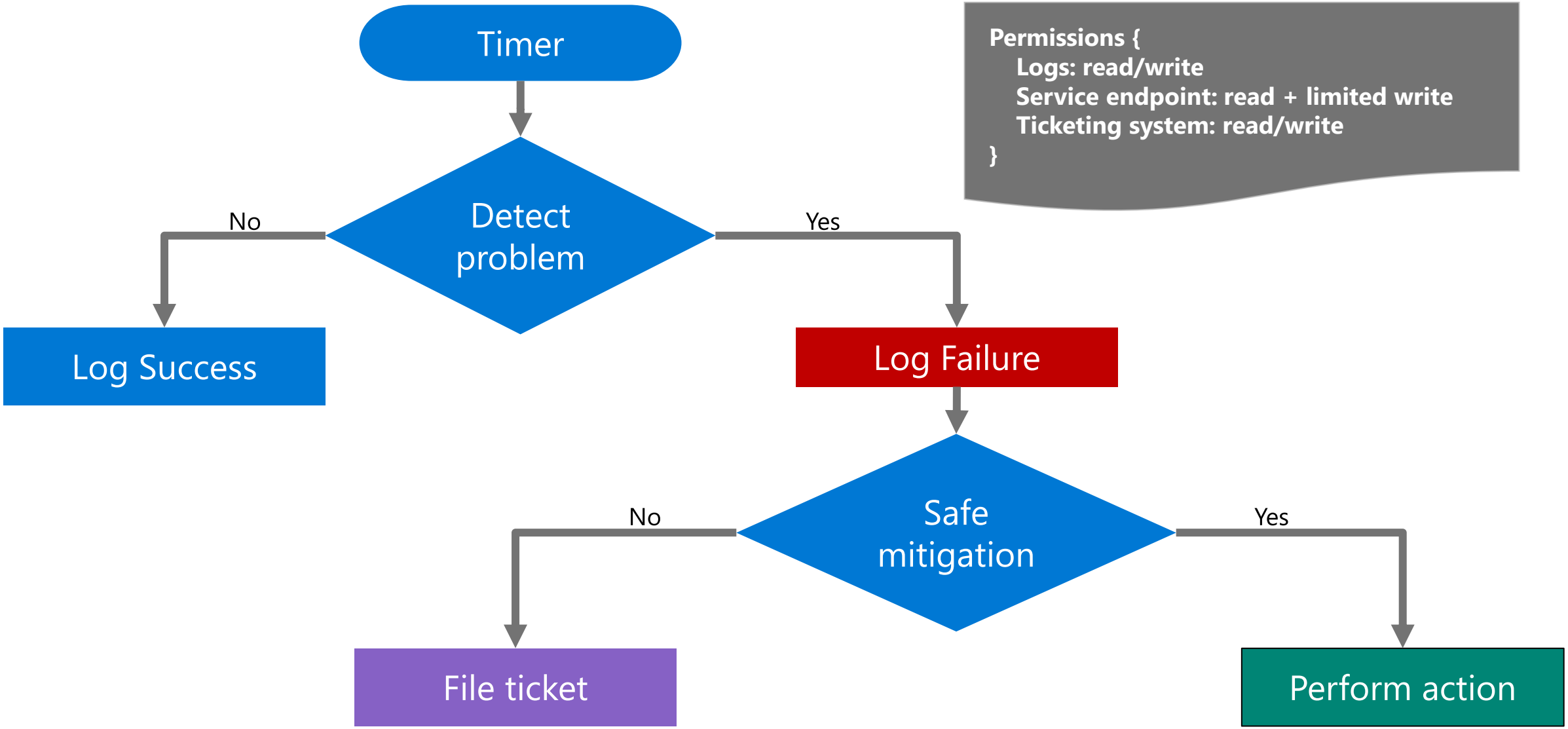
What can we automate?

Auto-Diagnose/RCA




```
Permissions {
    Logs: read-only
    Service endpoint: read-only
    Ticketing system: read/write
}
```

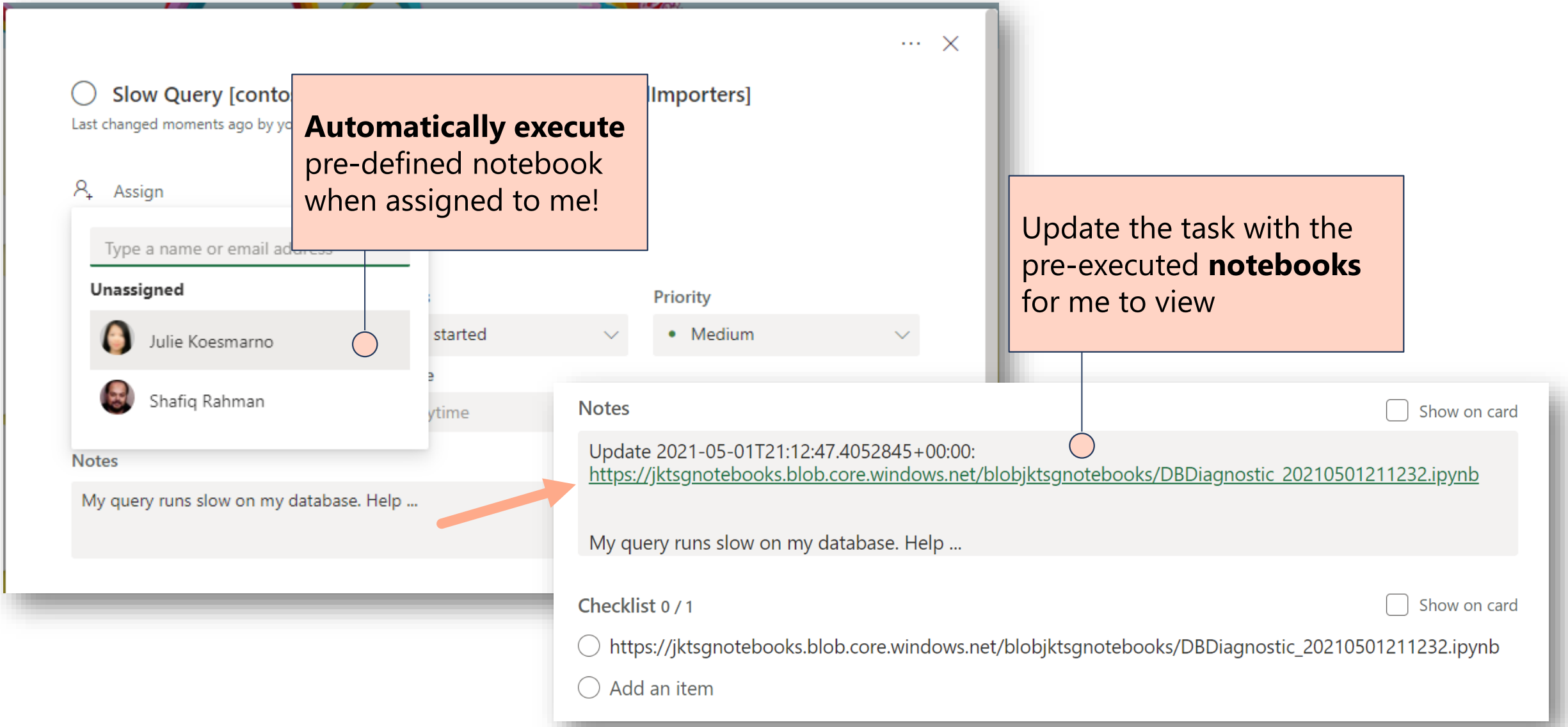
Auto-Detect and auto-mitigate

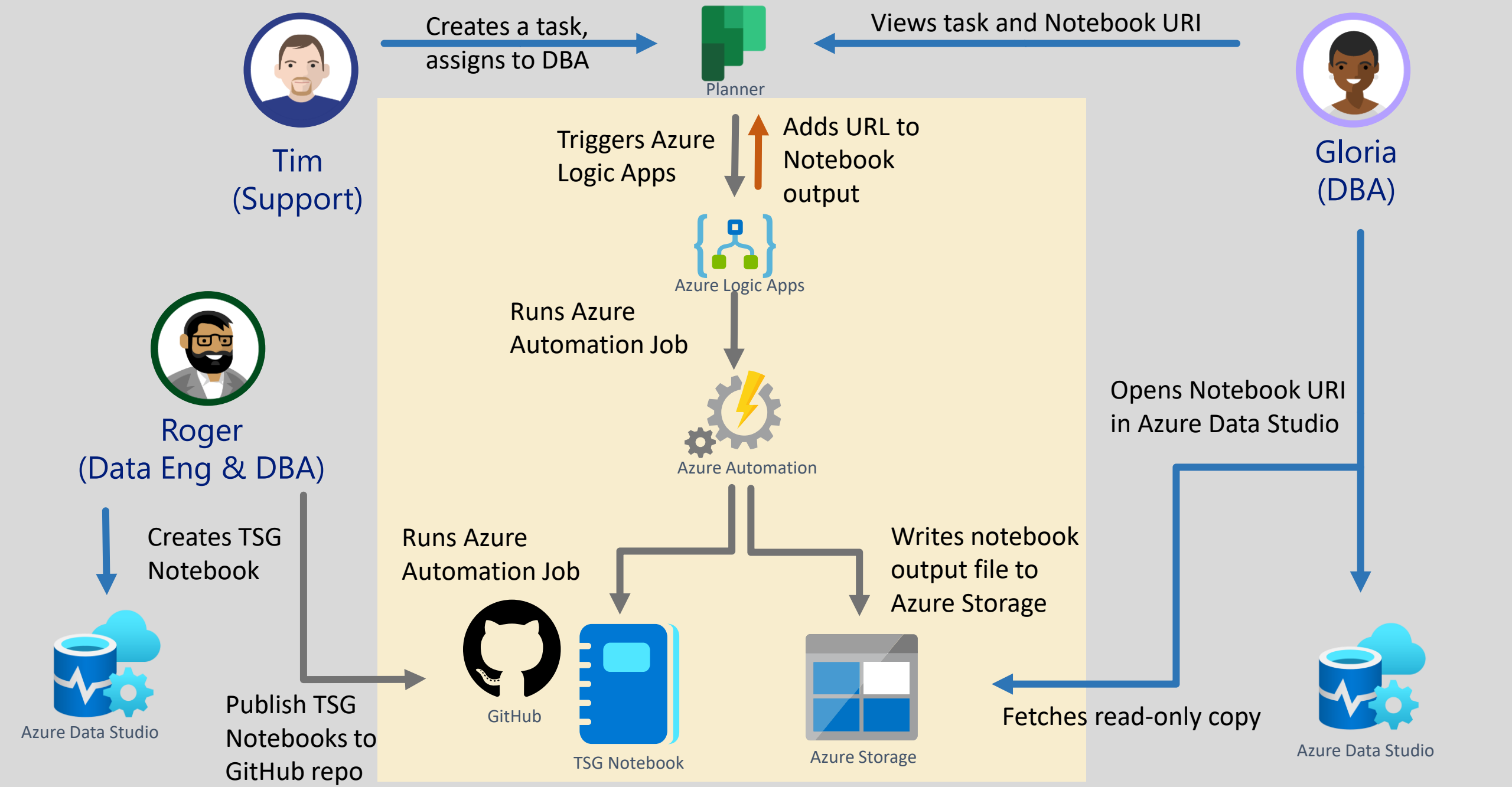


Demo: Auto Diagnose / RCA

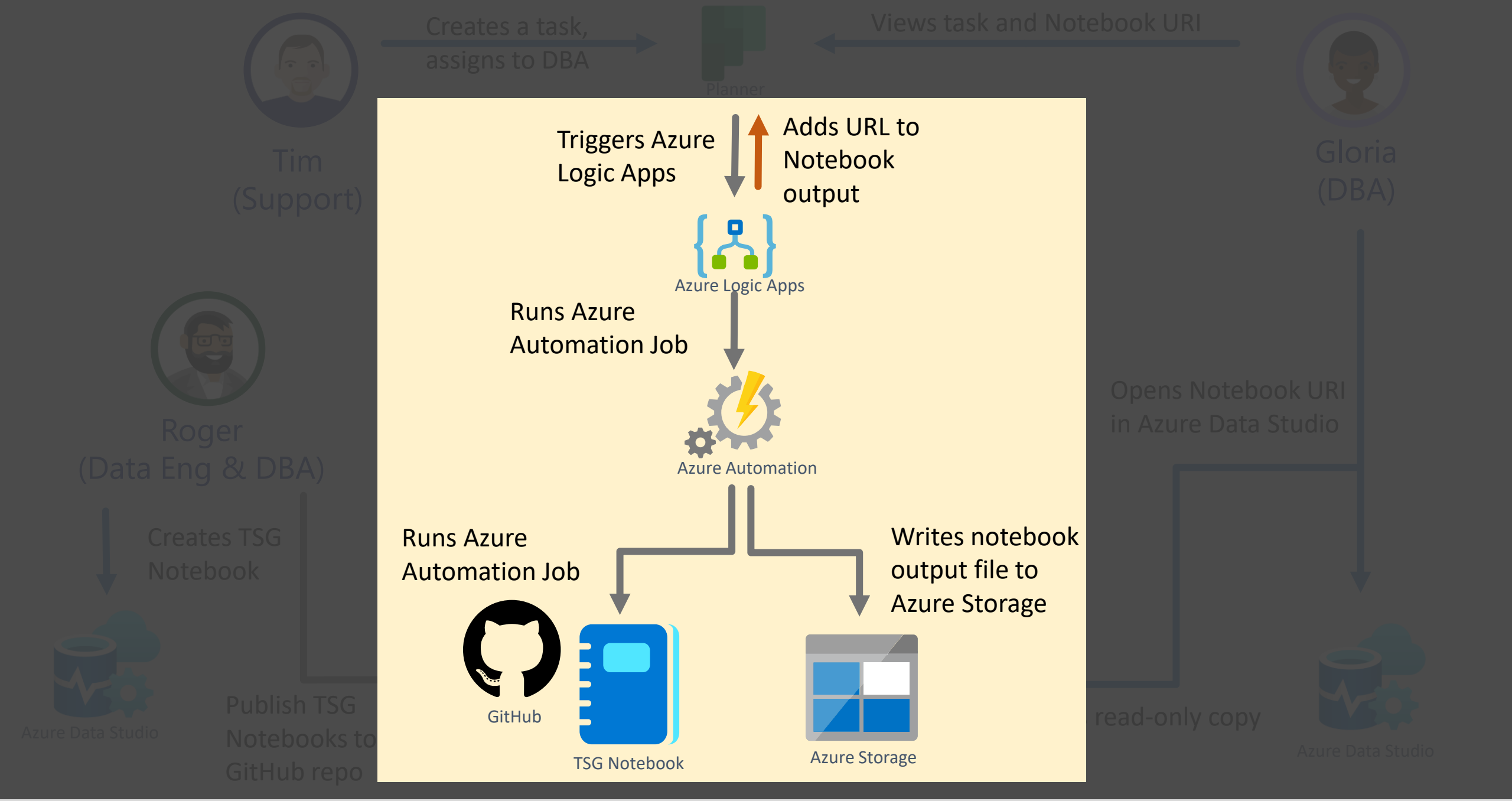
with Azure Logic Apps
(very similar to Power Automate)

A simple demo to illustrate a Support Case System with automated TSG execution





Demo: Automated task workflow with notebooks



Demo: Automated task workflow with notebooks

DemoTSGWorkflow

Logic app

Search (Ctrl+/)

Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems

Development Tools

Logic app designer
Logic app code view
Versions
API connections
Quick start guides

Settings

Workflow settings
Authorization

Run Trigger | Refresh | Edit | Delete | Disable | Update Schema | Clone | Open in mobile | Export

Edit

Introducing the new portable Logic Apps runtime that supports local development and debugging. Click to learn more. →

Essentials

View Cost | JSON View

Resource group (change)
jukoesma_exe_rg

Location
West US 2

Subscription (change)

Subscription ID

Definition
1 trigger, 5 actions

Status
Enabled

Runs last 24 hours
5 successful, 2 failed

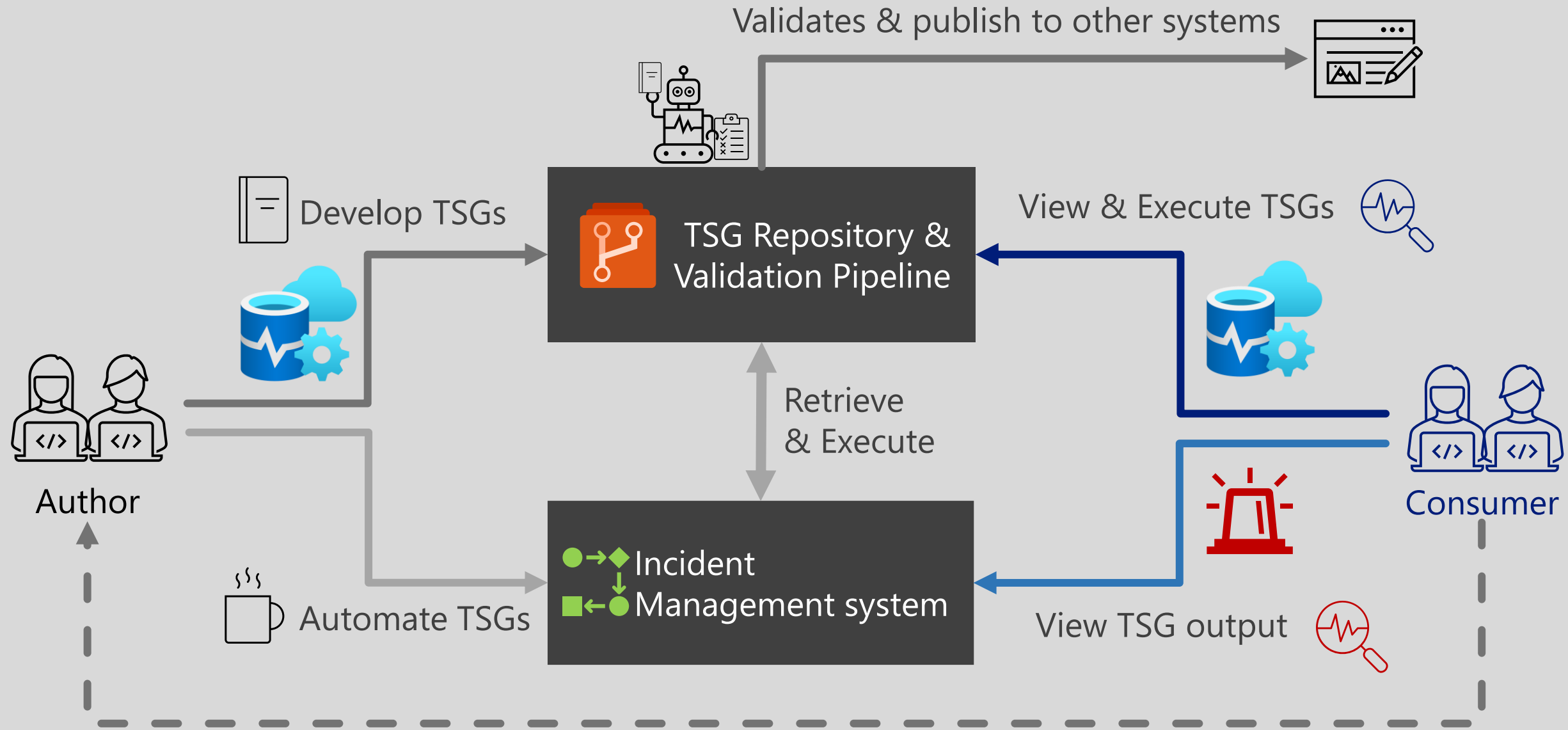
Integration Account
-- --

Get started | Runs history | Trigger history | Metrics

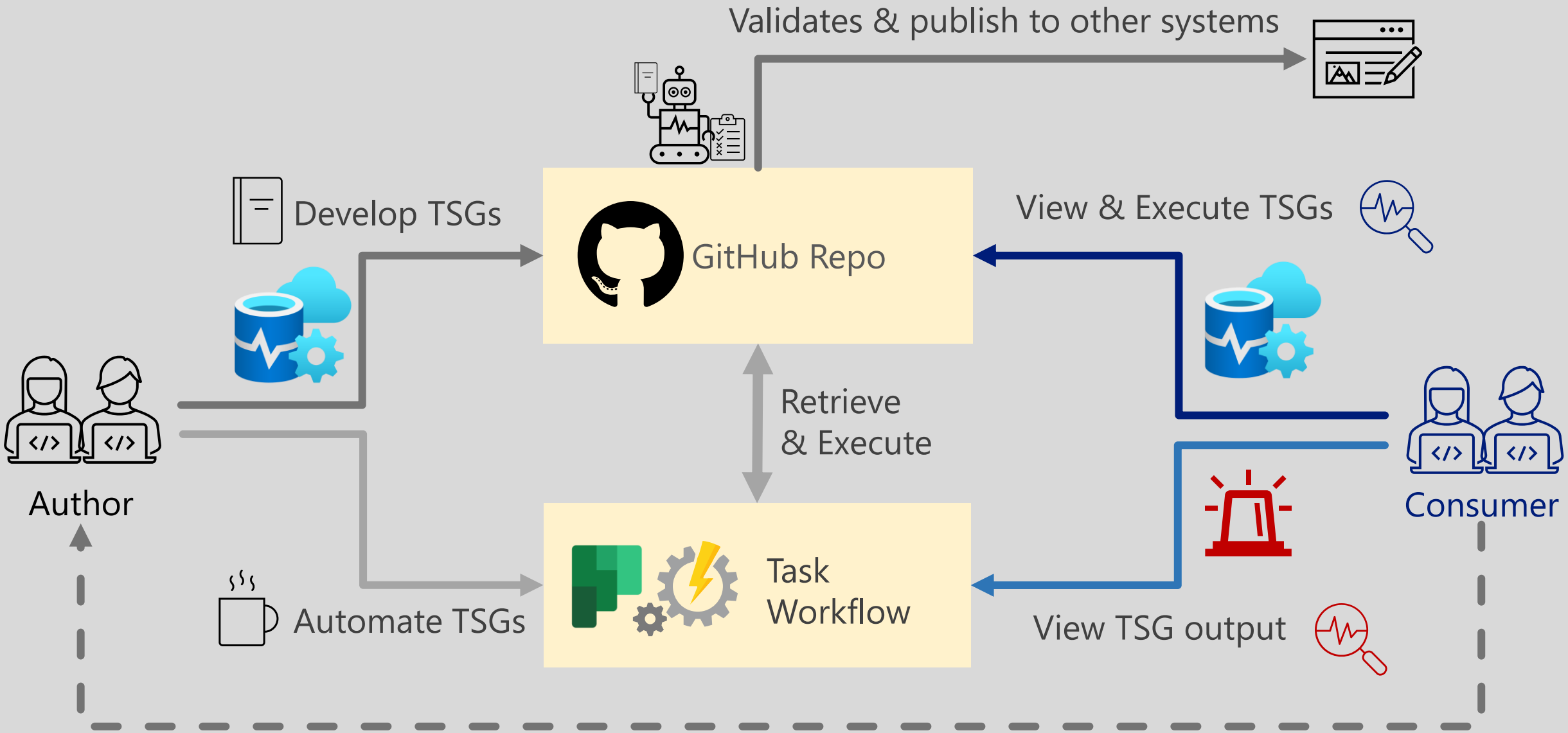
All | Start time earlier than | Pick a date | Pick a time

Specify the run identifier to open monitor view directly

Status	Start time	Identifier	Duration	Static Results
Succeeded	5/1/2021, 1:39 PM	08585817052871593324217...	1.34 Minutes	
Succeeded	5/1/2021, 12:56 PM	08585817078908637089165	45.74 Seconds	



Incident management workflow with notebooks



Demo: Automated task workflow with notebooks

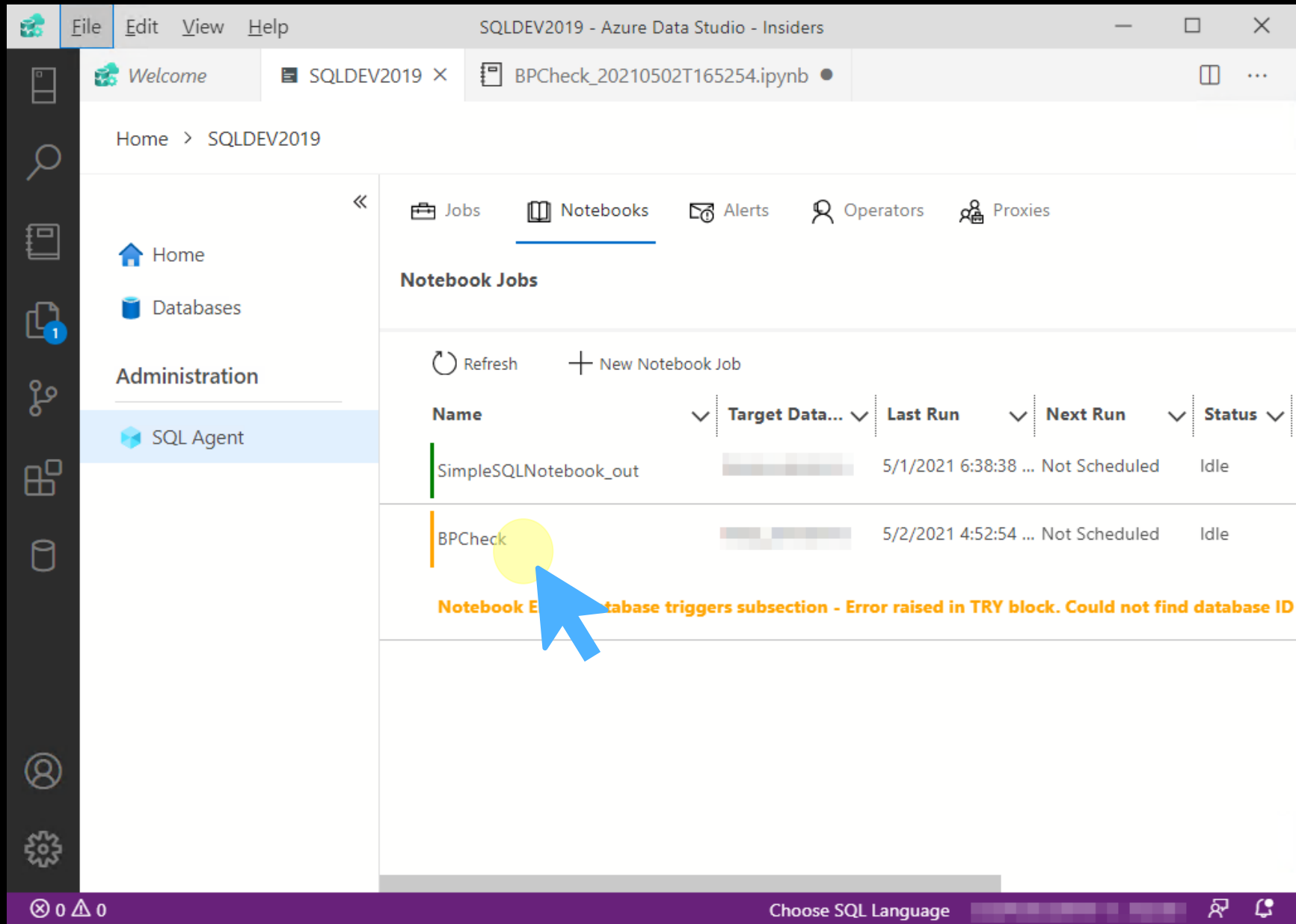
SQL Agent Job in Azure Data Studio

for automations

Use SQL Agent to automate SQL Notebooks

SQL Agent
Extension in Azure Data Studio.
Works for SQL Server.
Supports Notebooks (Preview).

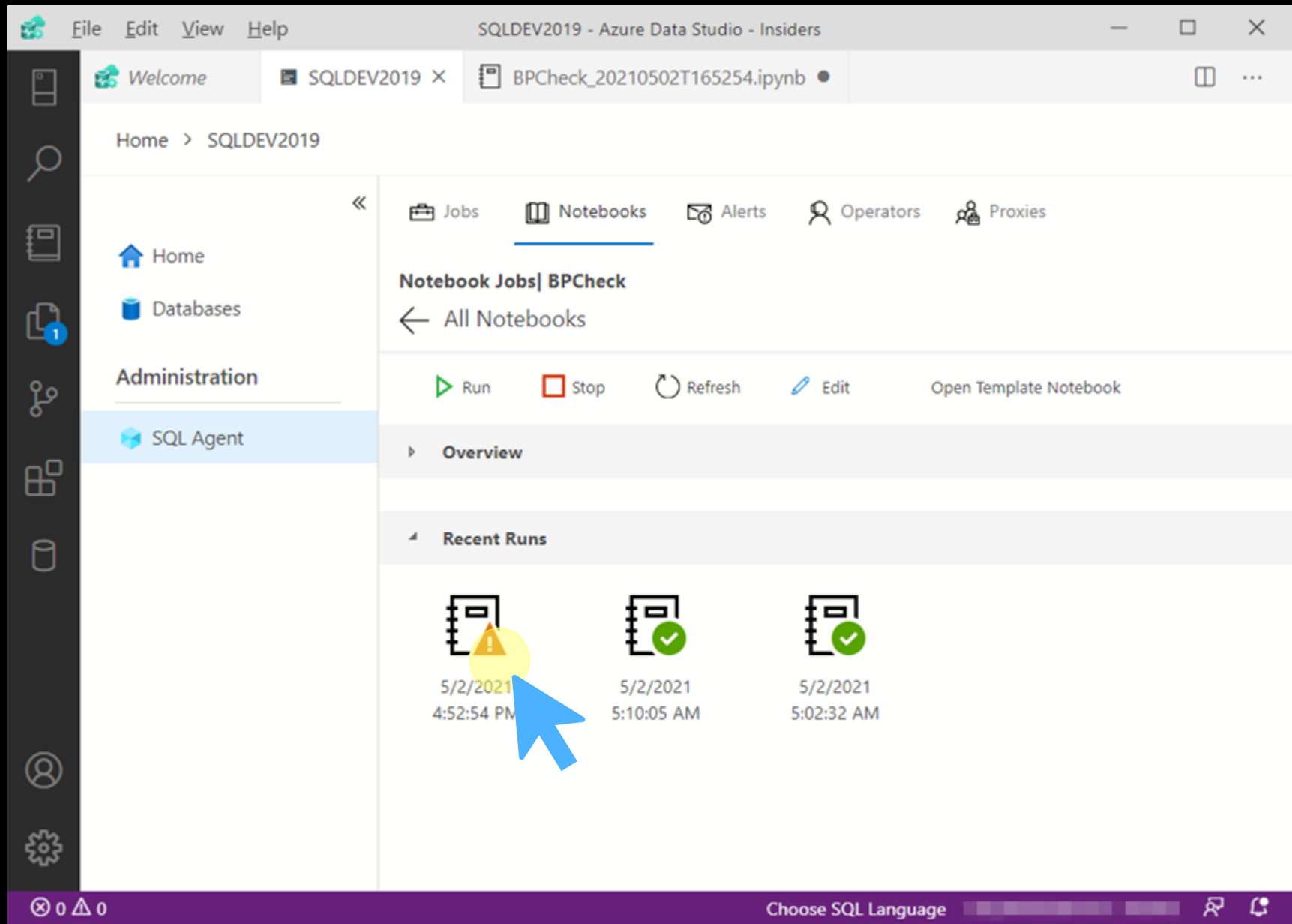
https://bit.ly/3yjwGtF



Open previously automated notebook run

SQL Agent
Extension in Azure Data Studio.
Works for SQL Server.
Supports Notebooks (Preview).

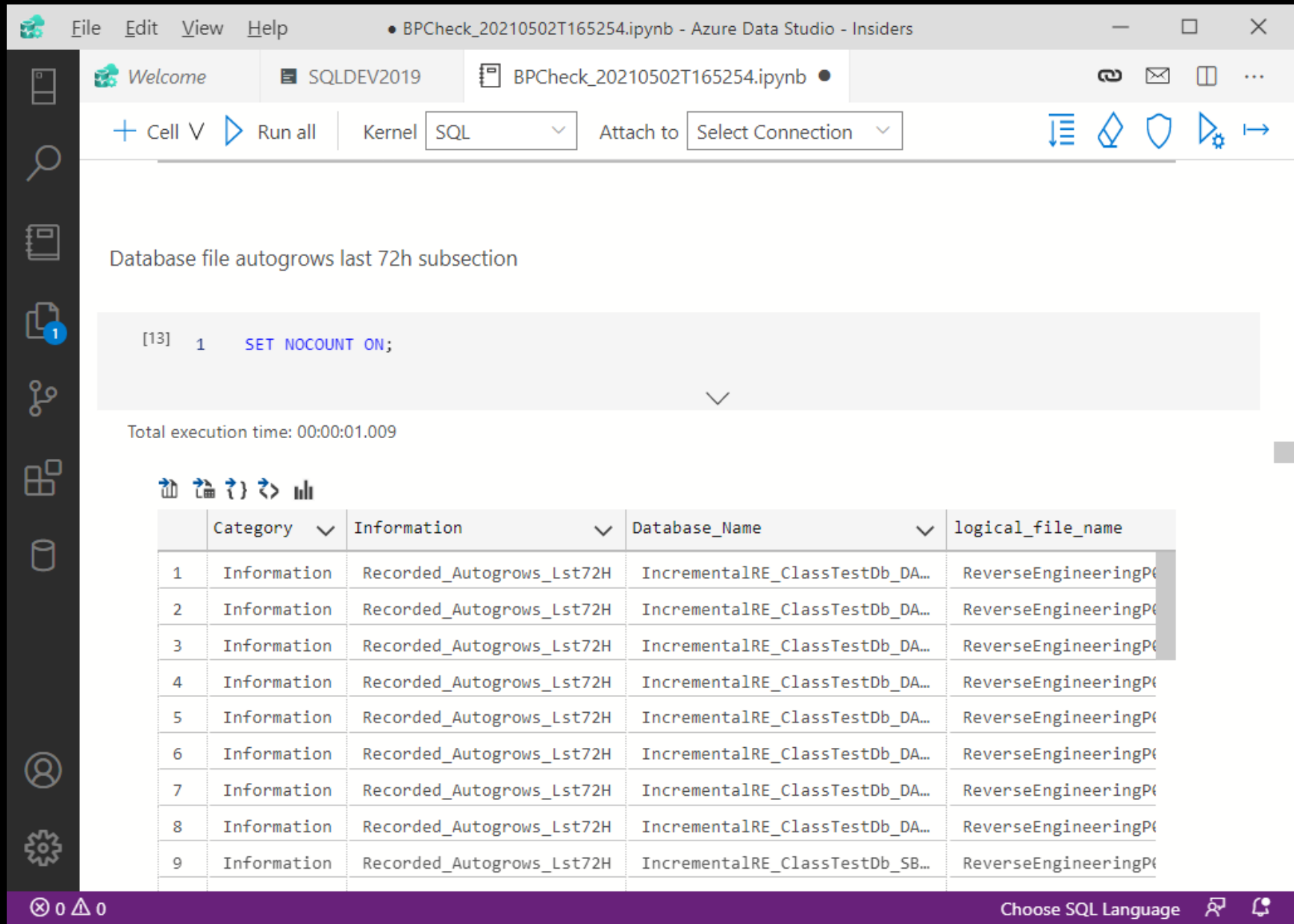
https://bit.ly/3yjwGtF



Examine the results of the notebook run

SQL Agent
Extension in Azure Data Studio.
Works for SQL Server.
Supports Notebooks (Preview).

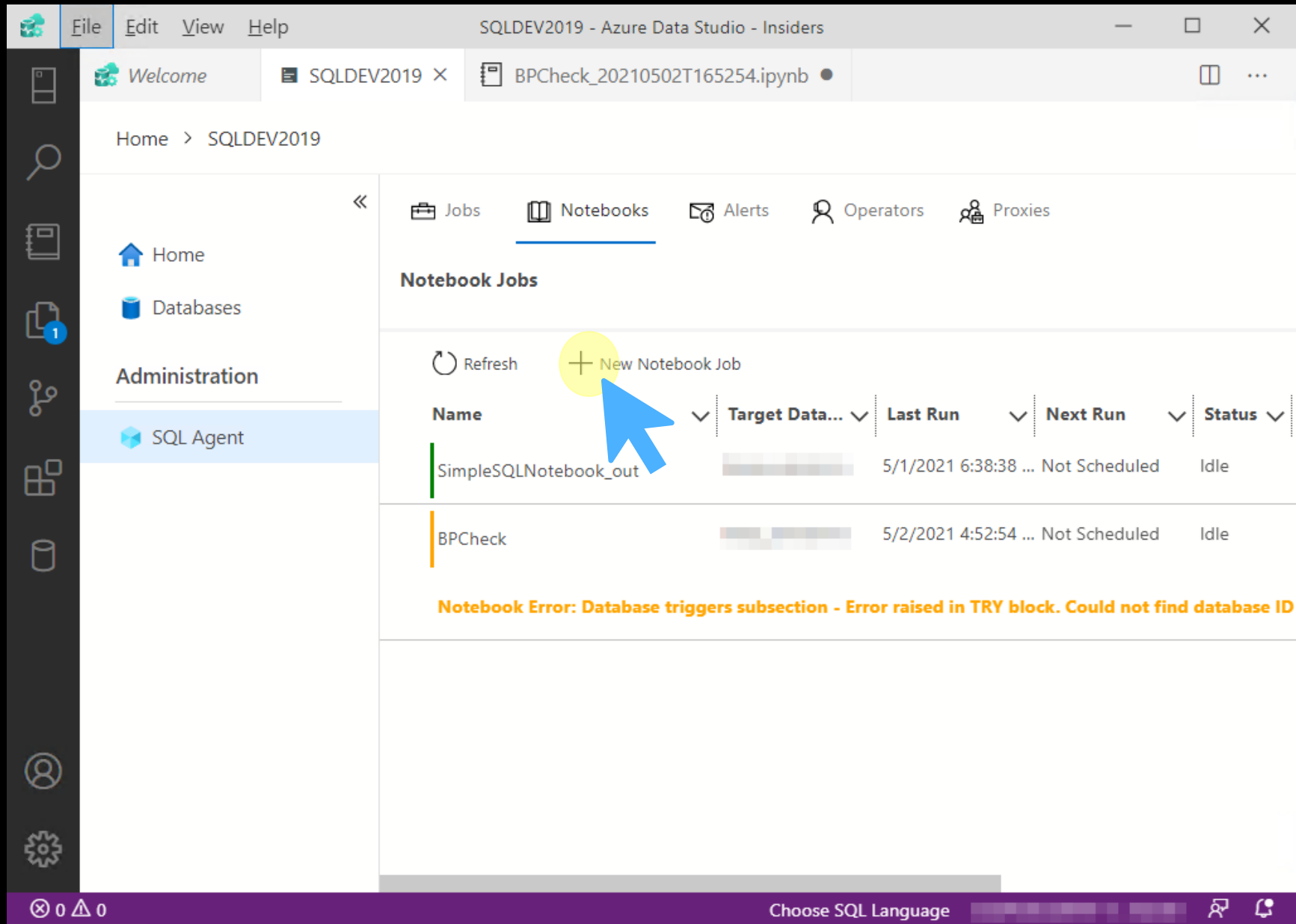
https://bit.ly/3yjwGtF



Create a new Notebook Job using SQL Agent

SQL Agent
Extension in Azure Data Studio.
Works for SQL Server.
Supports Notebooks (Preview).

https://bit.ly/3yjwGtF

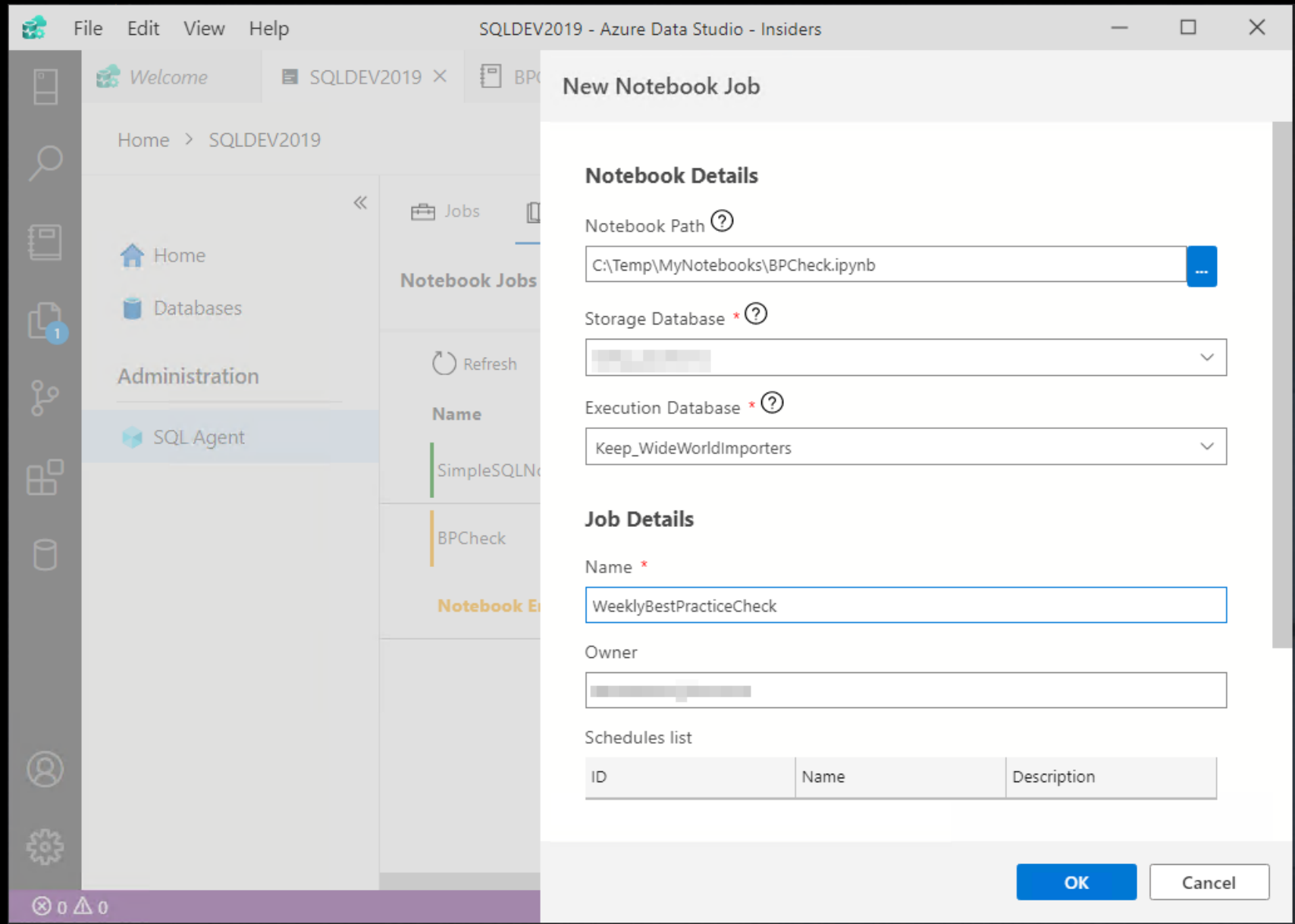


Create a new Notebook job

Notebook Path
Upload a notebook into the Storage Database

Storage Database
Where you'd like to store the notebook definition and job details

Execution database
Which database you'd like to run this notebook against




5
Takeaways &
other resources

Quick Tips

1. Organize TSG Notebooks as Books / Jupyter books
2. Use Source Control – TSGs are now engineering artefacts
3. Apply software engineering principles to TSGs
4. Use Azure Data Studio for editing, executing and packaging TSGs
5. Remember the “before you run”
   Know your goals, understand the gaps, plan it.
6. Check other executable TSGs for inspiration
7. Set guidance / template on TSG
8. Pilot, learn and iterate your TSG changes
9. Identify what you can automate and flight them
10. Use your favorite automation tools (or learn new ones 😎)

Useful resources

Azure Data Studio: http://aka.ms/AzureDataStudio
https://github.com/microsoft/azuredatastudio/issues

SQL Assessment Toolkit: https://github.com/microsoft/sql-server-samples/tree/master/samples/manage/sql-assessment-api/notebooks

SQL Hybrid Toolkit: https://github.com/microsoft/tigertoolbox/tree/master/SQL-Hybrid-Cloud-Toolkit/content

Glenn Berry's Diagnostic Notebooks for SQL Server and Azure SQL DB: https://glennsqlperformance.com/resources/

Rob Sewell's Notebook http://sqldbawithabeard.com
https://github.com/SQLDBAWithABeard/JupyterNotebooks

The SQL Diagnostic (Jupyter) Book by Emanuele Meazzo
https://tsql.tech/the-sql-diagnostic-jupyter-book/

Techorama 2021 Session Notes:
https://bit.ly/3ow3wmM

Notebooks 101:
https://bit.ly/2Ryu9uW

thank you!

Techorama 2021

Julie Koesmarno (@MsSQLGirl)
Program Manager, Microsoft
jukoesma@microsoft.com

Shafiq Rahman
Engineering Manager, Microsoft
Shafiq.Rahman@microsoft.com