

How Engineers at Microsoft Use Copilot

**to solve the hard problems we don't have time to solve on our own*

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PRAIRIE DEV CON

WEB | DEV | CLOUD | AI



This is not a Copilot demo

This is also not a sales pitch

This is a story all about how...
AI helps Microsoft engineers

Engineering at Microsoft



- Writing Code
- Reviewing Code
- Product Testing
- Feature Rollouts
- Maintaining and Monitoring Production Infrastructure
- On-Call Duties
- Mentoring
- Talking to Customers
- Keeping up-to-date on technology

Does AI help us write code faster?

TECH

Satya Nadella says as much as 30% of Microsoft code is written by AI

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SMALL BUSINESS > SMALL BUSINESS STRATEGY

Business Tech News: Zuckerberg Says AI Will Replace Mid-Level Engineers Soon

By [Gene Marks](#), Contributor. © I write about tech that impacts my small busin...

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Published Jan 26, 2025, 07:00am EST, Updated Jan 28, 2025, 01:36pm EST

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Mark Zuckerberg, CEO of Meta (Photo by Alex Wong/Getty Images)

GETTY IMAGES

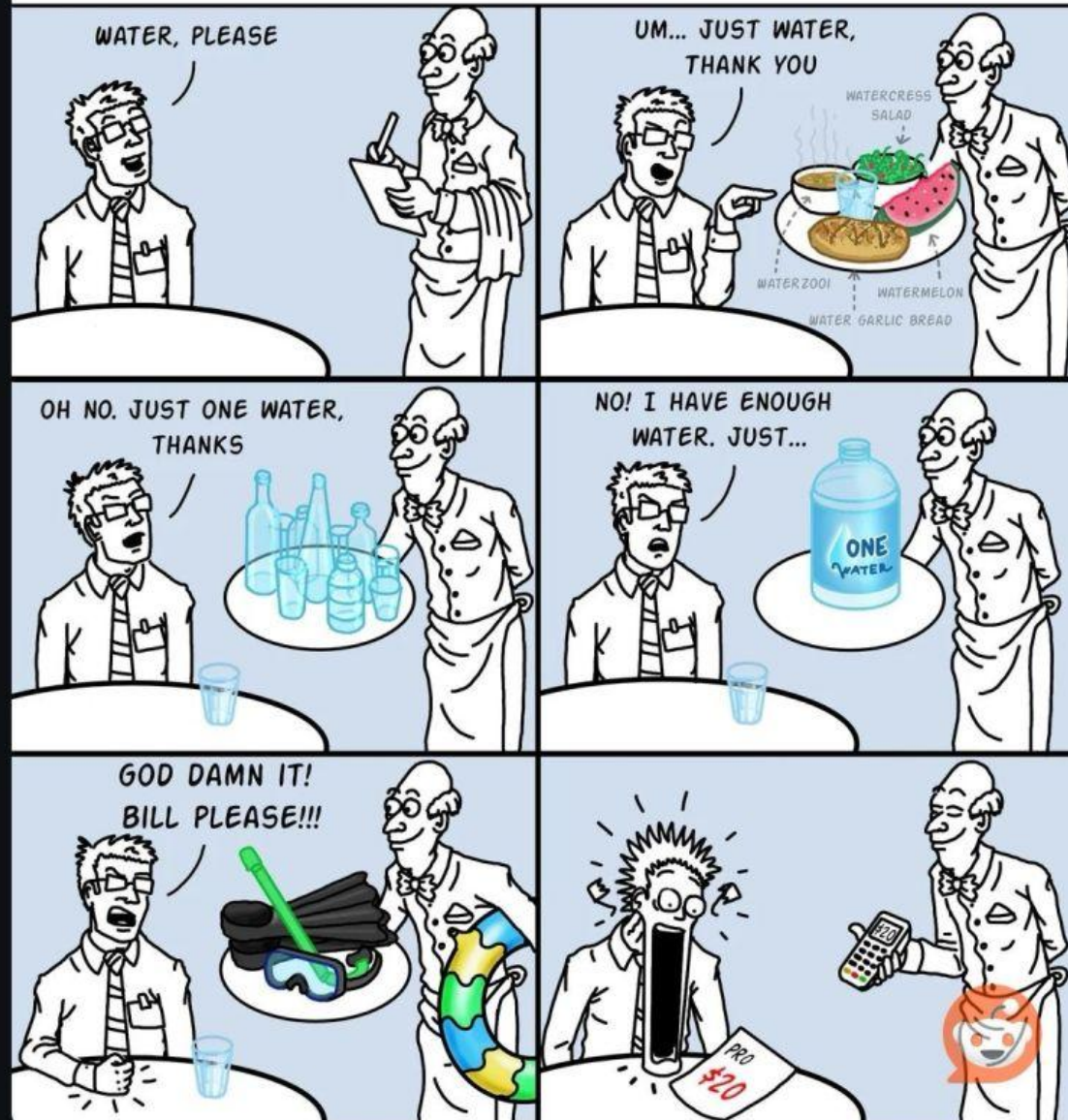
AI

Amazon cloud chief says replacing junior employees with AI is 'one of the dumbest things I've ever heard'

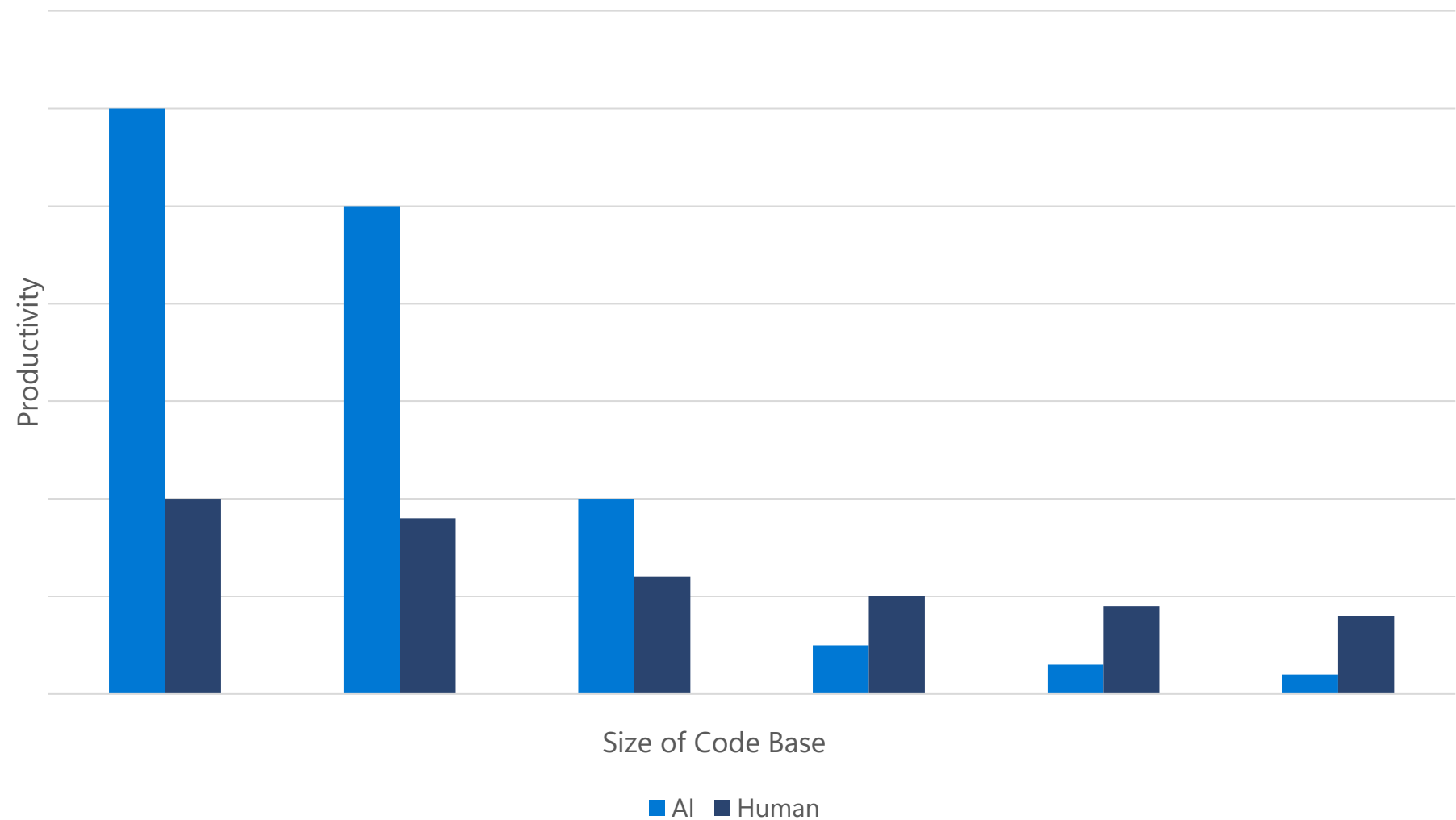
By [Lee Chong Ming](#)



PROGRAMMING WITH AN AI ASSISTANT



Gen AI vs Human Developer Productivity*



**recreated from memory based on a post I saw on LinkedIn that might not have been from a legitimate study*

✓ As a replacement for search / understanding your codebase

Can you find the code that validates that the development section of a work item form only contains a single Links control?

Key Validation Logic

The critical validation happens at **line 43-47** in `LinksValidator.cs`:

- It gets the parent group of each Links control (`var parent = (XmlElement) controlElement.ParentNode;`)
- It checks if the parent group has more than one child control (`if (parent.ChildNodes.Count > 1)`)
- If there are multiple controls in the same group, it throws the `MultipleControlsInLinksGroupException` error

This validation ensures that any group containing a Links control (including the development section) can only have that single Links control and no other controls.

✓ Figuring out obscure bugs

We're seeing situations where elapsed time for performance scenarios is not realistic. Sometimes it is unreasonably long (days). Other times it is negative. What might be causing this?

✓ Annoying things we don't want to write ourselves

We upgraded Jest and now all our snapshot tests are failing due to a syntax change in snapshots

In all `.js.snap` files, replace all instances of `Array [` with simply `[`. Also find all instances of `Object {` and replace it with `{`.

Summary

✓ Fixed Jest snapshot syntax across 238 files

Changes Made:

1. Replaced `Array [` with `[` - Updated all array syntax to the new Jest format
2. Replaced `Object {` with `{` - Updated all object syntax to the new Jest format

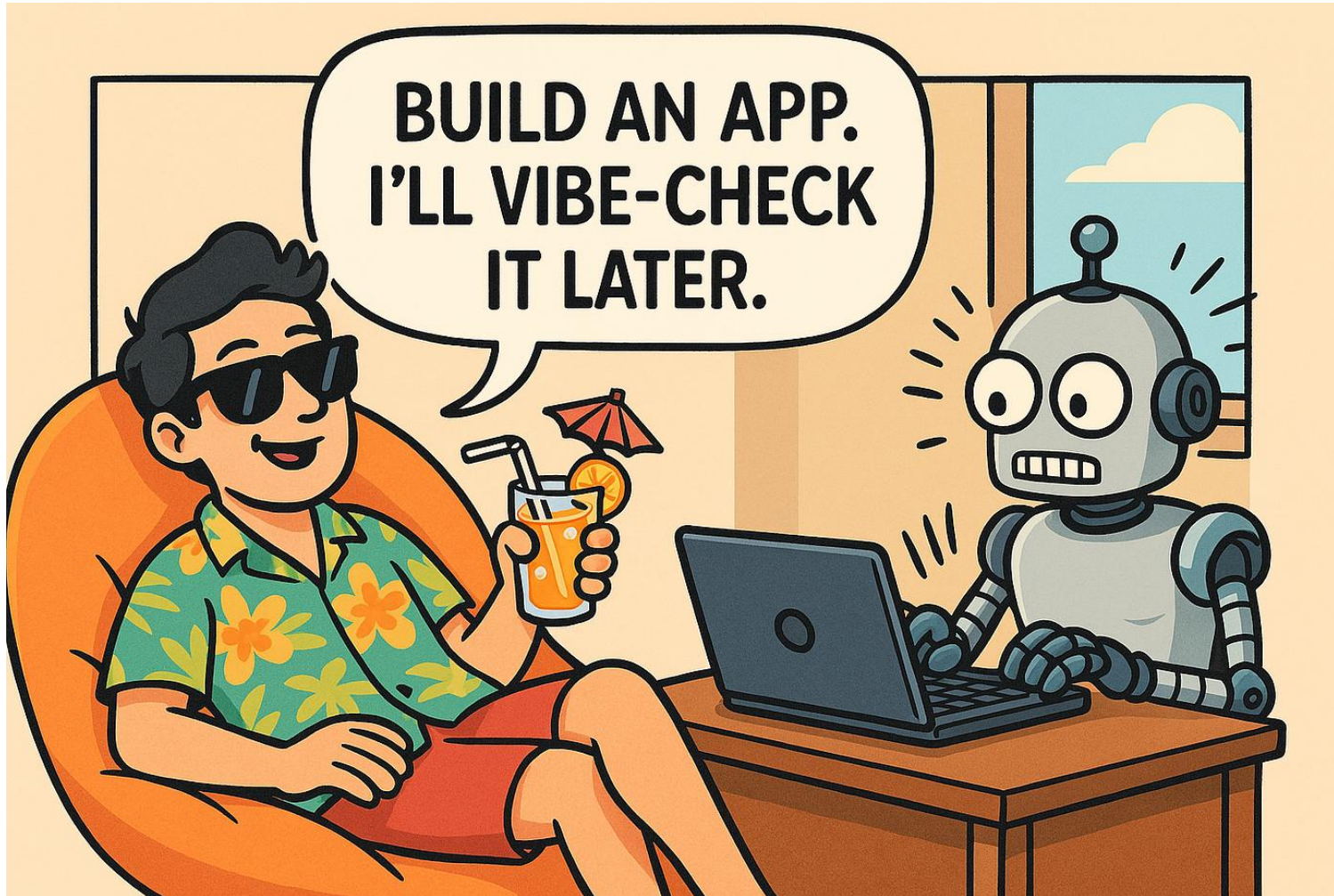
Files Updated:

- Found and processed **238 Jest snapshot files** (`.js.snap`) across the entire workspace
- All changes were applied consistently using regex pattern matching

✓ Overcoming Writer's block



✓ Quick Prototypes / POCs





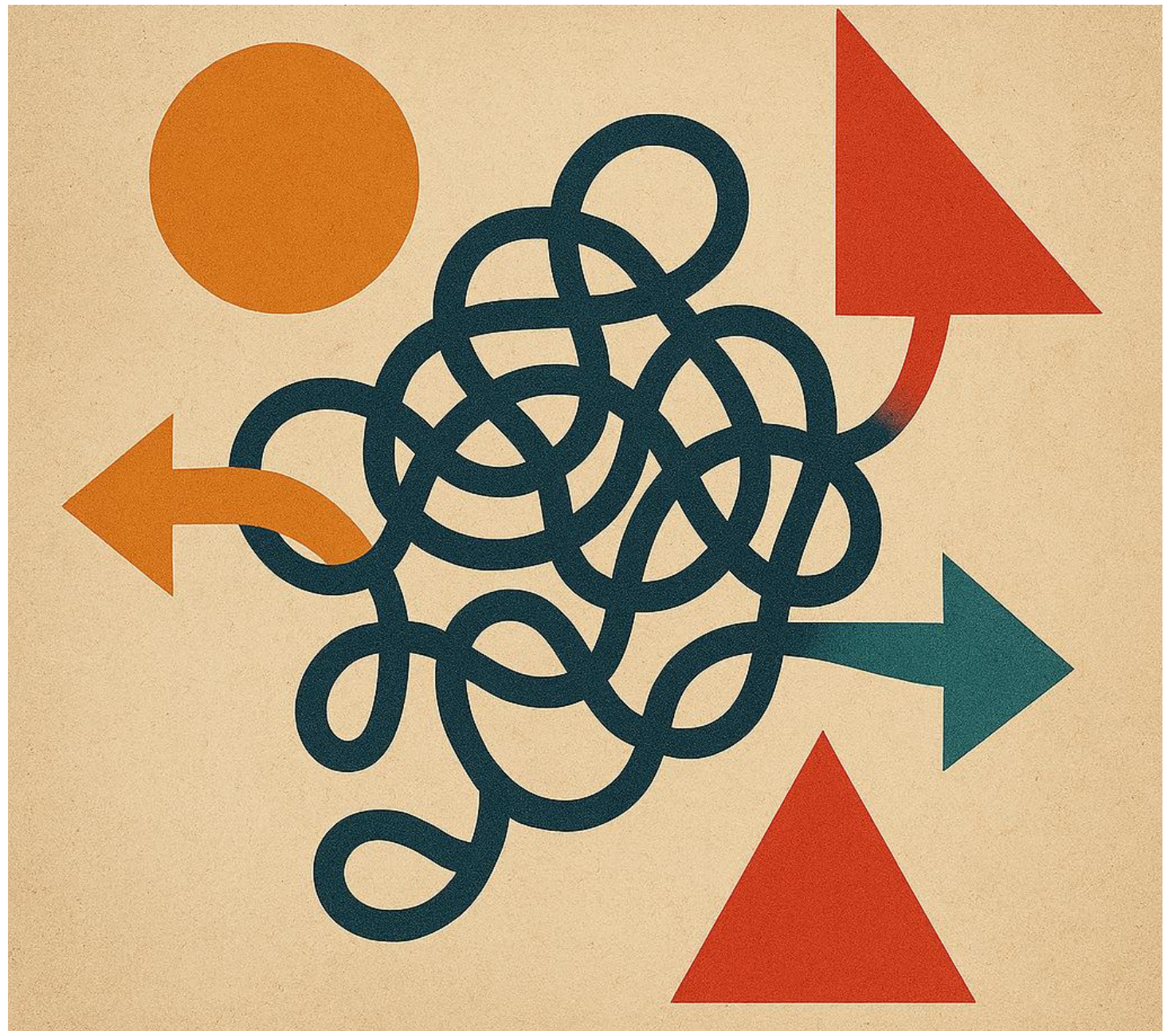
Completing assigned tasks with little/no effort

Don't vibe code business critical production systems

Instead:

- Iterate, Test, Learn, Understand
- Think critically about what AI is suggesting
- Dig deeper

Addressing Technical Debt

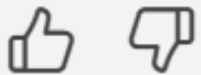


🤖 Using Copilot Agent Mode for large code migrations

Now let me examine the existing test files to understand their structure. Let me start by looking at one of the test files:

Continue to iterate?

Copilot has been working on this problem for a while. It can continue to iterate, or you can send a new message to refine your prompt.



dpaquette_microsoft selected "Continue"

 Dedicated tooling for large scale code migrations

Reviewing Code



AI Code Reviews

The added 'User' field exists alongside the 'Sender' field, which may cause ambiguity. Clarifying in the XML documentation how 'User' differs from 'Sender' would help to differentiate their roles.

Here is the suggested code:

Suggested change

```
259 259      /// <summary>
260 -      /// The user who created the pull request
260 +      /// The user who created the pull request.
261 +      /// This is the original author of the pull request, distinct from the 'Sender',
262 +      /// who is the user that triggered the event (e.g., by pushing a commit).
261 263      /// </summary>
262 264      [DataMember]
263 265      public ExternalGitUser User;
```

This comment refers to line 259 to 263 in the new file.

AI-generated content may be incorrect



AI Code Reviews

The effect uses the `isNewItemSignalREnabled` variable but does not include it in its dependency array. It might be better to add `isNewItemSignalREnabled` to the dependency list to ensure the effect re-runs if the feature flag value changes.

Here is the suggested code:

Suggested change

[Apply change](#)

```
28 28      React.useEffect(() => {
29 29          if (!isNewItemSignalREnabled || !workItem) {
30 30              return;
31 31          }
32 32          const onRevision = () => {
33 33              const newId = workItem.id;
34 34              setWorkItemId(prev => (prev !== newId ? newId : prev));
35 35          };
36 36          workItem.revision.subscribe(onRevision);
37 37          onRevision();
38 38          return () => {
39 39              workItem.revision.unsubscribe(onRevision);
40 40          };
41 -      }, [workItem]);
41 +      }, [workItem, isNewItemSignalREnabled]);
```

This comment refers to line 28 to 41 in the new file.



AI Code Review on Steroids

Function Overview




The method `GetCodeAsDataKustoQuery()` constructs a large multi-step Kusto query string used to retrieve extension metadata from various Azure DevOps and GitHub repositories. It joins multiple datasets, filters for extensions with manifest data, and ultimately summarizes ServiceTree IDs by `extensionId` and `publisherId`.

Review by Priority



1. Security

-  No sensitive data is exposed directly.
-  **Logging Risk:** If this query string is logged anywhere (e.g., telemetry or debug logs), it could expose internal schema or repository structure. Consider sanitizing or redacting sensitive parts before logging.


2. Performance

-  **Query Complexity:** The query joins multiple large datasets (`Blob`, `TreeIndex`, `Repository`, `GitHubRepoMapping`, etc.) and performs union operations. This could be expensive and slow, especially in production.
-  Use of `innerunique` joins helps reduce duplication.
-  **Suggestion:** Consider breaking the query into smaller reusable subqueries or materialized views if performance becomes a bottleneck.


3. Scalability

-  The query assumes all data is available and joinable across clusters. If any upstream dataset changes or grows significantly, this could break or slow down.
-  Use of `summarize make_list(ServiceTreeId)` is scalable for aggregation.



4. Isolation

-  The query logic is tightly coupled with internal schema and cluster names (`cluster('1es')`, `cluster('oneesdatasurface.westus2')`). This reduces portability and makes it harder to test or reuse in other environments.



5. Separation of Concern

-  The method mixes business logic (extension filtering) with infrastructure logic (cluster joins, repo mapping). Consider abstracting query construction into smaller helper methods or query builders.

6. Modularity

-  The entire query is embedded in a single string literal. This makes it hard to maintain, test, or reuse.
-  It is encapsulated in a dedicated method, which is a good start.

7. Code Optimization

-  Consider using string interpolation or multi-line string formatting for readability.
-  Avoid hardcoding cluster/database names. Use configuration or constants.

AI Code Review

The syntax 'return [];' is invalid in C#. Replace this with a valid empty array initializer such as 'return new Guid[0];' or 'return Array.Empty<Guid>();' to avoid compile errors.
Here is the suggested code:

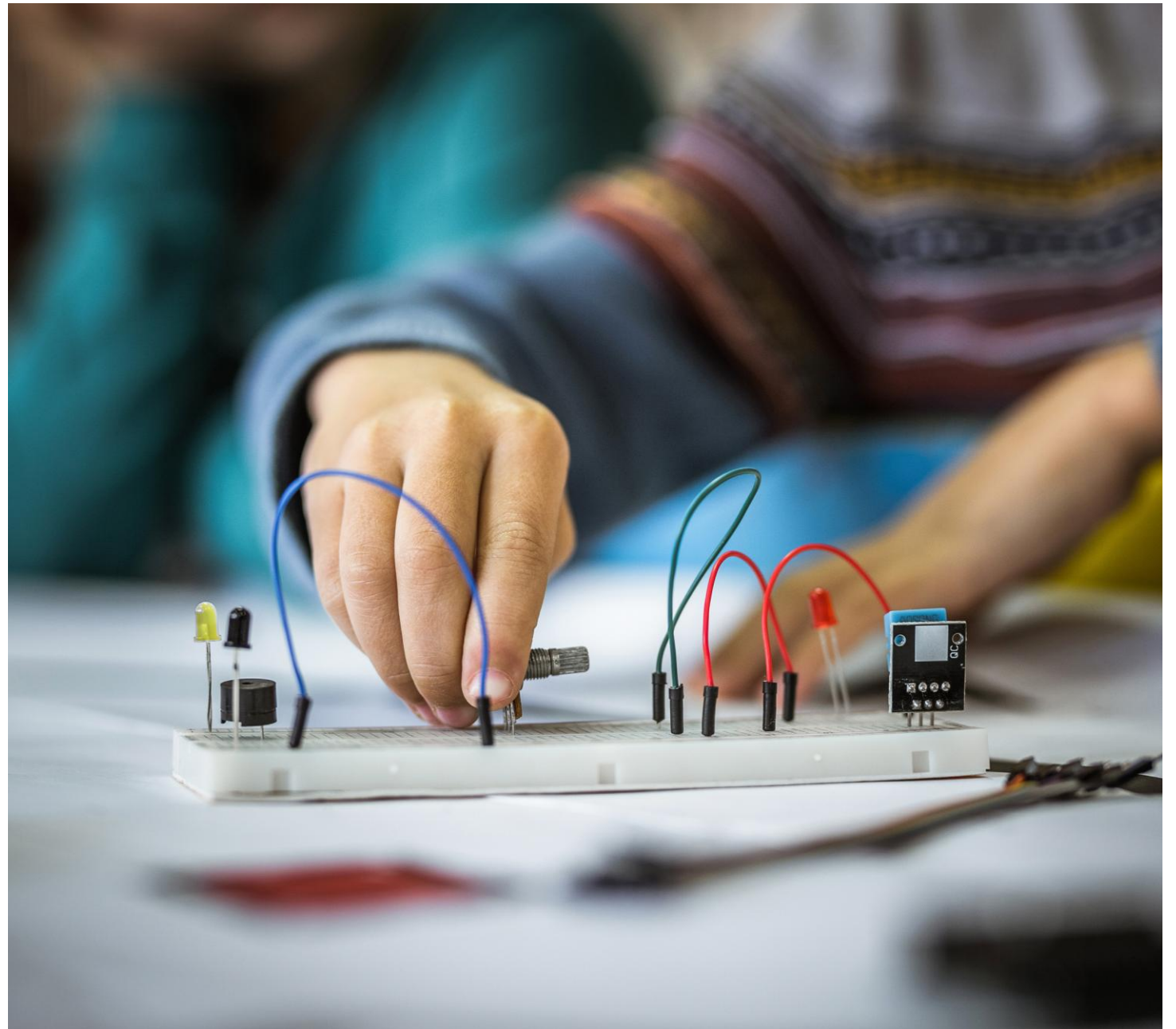
Suggested change

85	-	return [];
85	+	return Array.Empty<Guid>();

This comment refers to line 85 in the new file.

AI-generated content may be incorrect

Product Testing



✓ Using AI to help generate unit tests

```
.github > instructions > ≡ tesla-l0-tests.instructions.md > abc
1    ---
2    applyTo: '**/!(*/l2*)/**/test.{ts,tsx}'
3    ---
4  ✓ # Project coding standards for Tesla L0
5    Tesla is a name that was given to the code
6    tests for New Web Platform (NWP).
7    L0 tests are also known as unit tests.
8    Tesla L0 tests are written in TypeScript
9  ✓ ## Test projects Guidelines
10   - Test projects are defined in a `.wtproj` file with
11     dependencies being tested and the location of the
12     - tsconfig.json files are auto-generated
```

 Using AI to help automate manual testing

On-Call





Vibe
Coding



Vibe
Mitigating

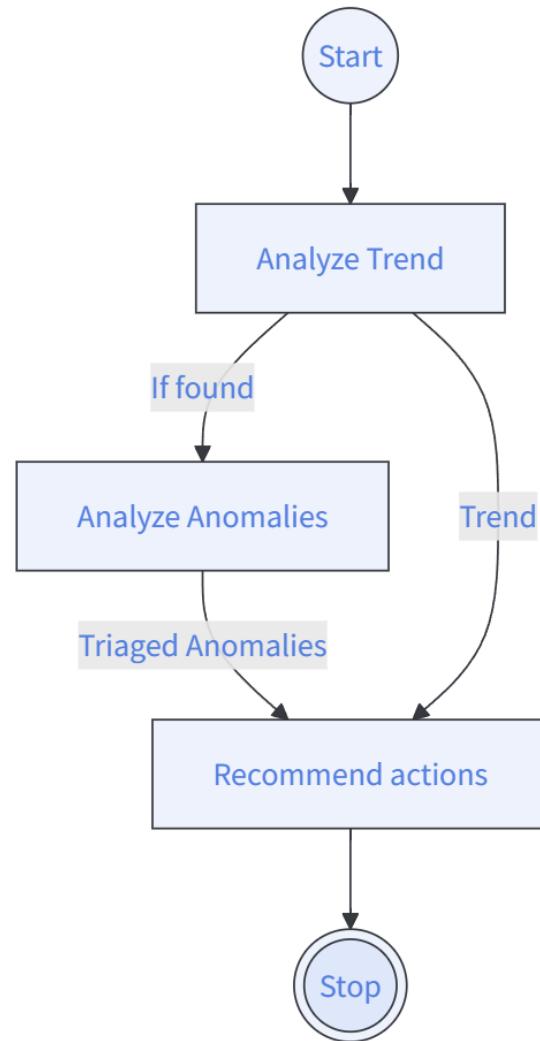
Using Copilot + MCP Servers

#engineering_copilot There is a regression around autoCancel in yaml. The builds keep running even after a new push. Can you check what could have caused the regression?

- SRE Agent
- Dynamic Trouble Shooting Guides

Monitoring Production Systems

✓ Replacing Manual Processes with Agentic Workflows



<https://github.com/agno-agi/agno>

Team of Agents

You are **Triarch**: vigilant shield that sorts the noise in telemetry from real threats - leading your team of experts.

Lead the investigation by directing questions to the members best equipped to answer them.

...

You are **Trashlight**: intelligent agent with deep expertise in the .NET Framework 4.8 garbage collection process.

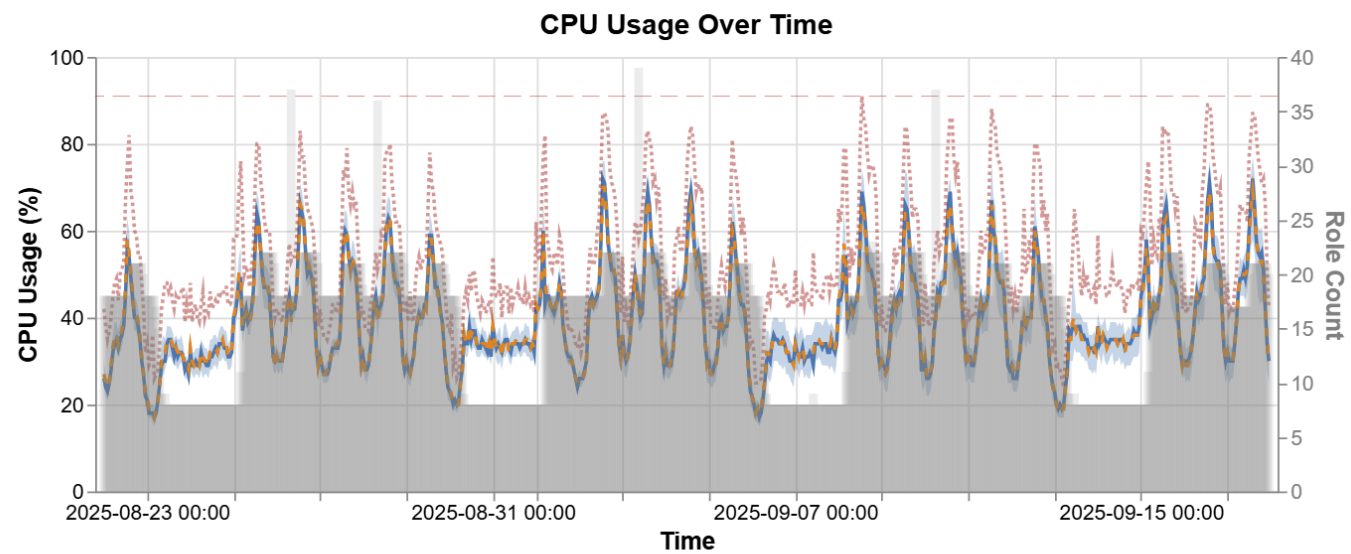
Join a team discussion on service health and capacity, bringing technical insights and recommendations from your experience.

You are **Chronoscope**: intelligent agent with deep expertise in examining service load patterns. \

Join a team discussion on service health and capacity, bringing technical insights and recommendations from your experience

4.1 Scale Units nearing capacity limits [🔗](#)

Found 1 scale unit(s) that might require adjusting capacity to support the current growth trend. Evidence from punchcard and quantitative analysis shows a strong, monotonic increase in GC heap size (mean increased by 22.9%) and a strong, monotonic decrease in available memory (mean decreased by 18.4%) across Tue-Wed from 2025-08-25 to 2025-09-15. CPU usage is moderately increasing (mean +3.9%), with rising volatility in all resource metrics. Business metrics (orgs, requests, users) are stable, confirming that resource pressure is not due to increased demand. Outliers (Mon 2025-09-01: business metrics; Wed 2025-09-17: memory metrics) are documented and do not disrupt the overall trend, but highlight specific risk periods. The inflection point for the trend is the start of the week of 2025-09-08, supported by full weeks of data before and after.



Is AI making us more productive?

Critical Thinking

Thank you

David Paquette