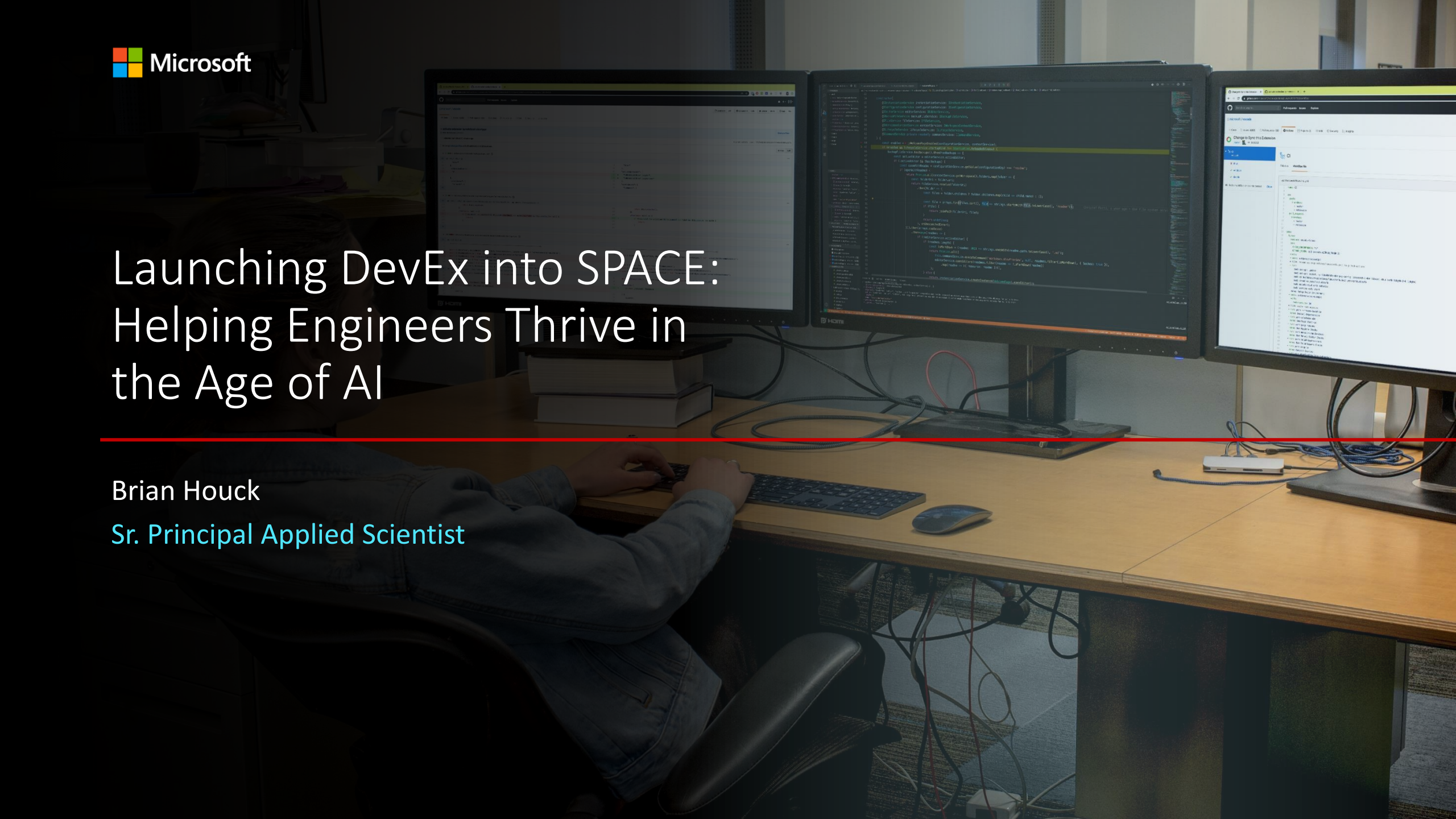
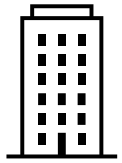


Launching DevEx into SPACE: Helping Engineers Thrive in the Age of AI

Brian Houck

Sr. Principal Applied Scientist

I study the human factors of productivity



How does building design shape productivity?

Modern office designs can increase developer engagement, improve collaboration and boost overall output by up to **10%**

What effects does weather have on developer behavior?

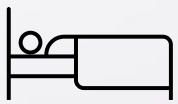
Snow days in Seattle result in an average of **18%** less time spent coding then non-snowy winter days.

Just how much do bureaucratic meetings crush our happiness?

"Too many meetings" is the **#2** most frequently cited workplace challenge by developers and facing bureaucratic work processes makes devs **70%** more likely to be looking for another job.

Is more vacation time the secret to greater productivity?

In an experiment, two unplanned vacation days resulted in no loss in Pull Requests, but with reduced burnout lasting for **12** weeks.



How much does sleep really fuel productivity?

Curious? Join my next talk—study in progress!

I get asked a lot of questions by engineering leaders

Then

“Is offering Taco Tuesday in the office worth it?”

“What’s the ideal PM-to-Developer ratio for our team’s success?”

“How should we structure our hybrid work policy to maximize productivity?”

Now

"*How can I measure the impact of AI tools on developer productivity?*"

The spectrum of assumptions leaders make about AI

"Is it really worth the expense? How can I measure to find out?"

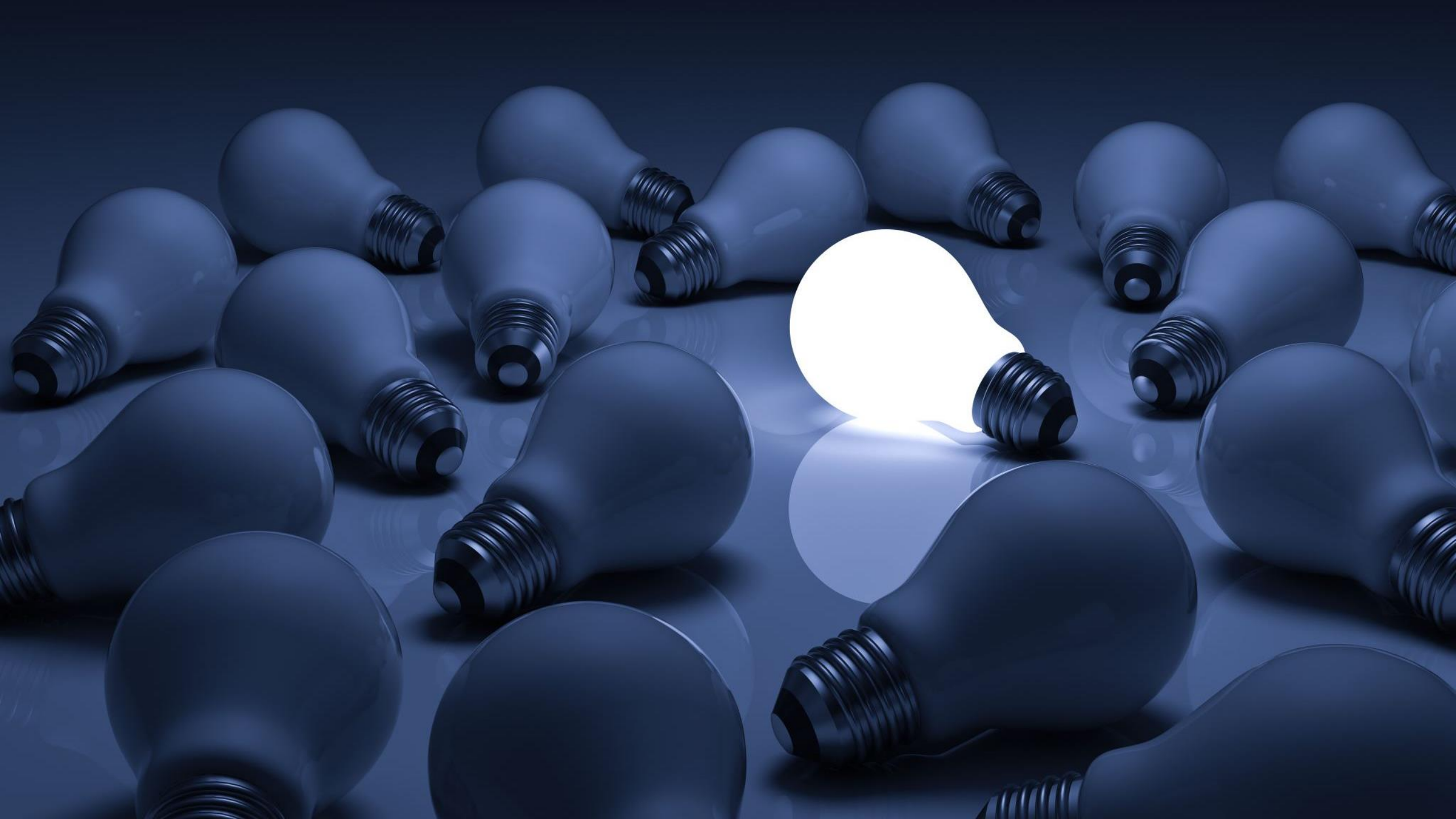
"Can I cut 50% of my devs?"

90% of developers who use AI believe that it helps them be more productive, and **79%** would be disappointed if they could no longer use AI tools for their tasks

Only **10%** of developers are concerned that AI may automate away their jobs

(https://aka.ms/aipaper)

(a not-yet-published survey of 500+ developers)



Understanding developer productivity with SPACE!

ACMQUEUE – March 2021

S Satisfaction and well-being

P Performance

A Activity

C Communication and collaboration

E Efficiency and flow

https://aka.ms/SpacePaper

Understanding developer productivity with SPACE!

Satisfaction and well-being

Performance

Activity

Communication and collaboration

Efficiency and flow

How do developers define productivity?

*"People are able to predictably deliver features that keep our customers happy **while learning and growing, constantly improving our culture, and staying happy themselves**"*

*"the **business value** created by effort…"*

*"**How many** Work Items / Tasks I can complete in a given week"*

*"how others leverage the engineer's work, and how the engineer **leverages the work of others**."*

*"Ability to work **free of distraction** and with **tools/process that do not slow down work**."*

https://aka.ms/SpacePaper

How do devs see AI impact productivity across SPACE

Percentage of Developers Reporting AI Improved SPACE Dimensions:

62% - Increases job satisfaction

71% - Increases ability to deliver customer and/or business value

88% - Increases task throughput

49% - Increases communication/collaboration with peers

82% - Increases ability to do job efficiently

Source: (a not-yet-published survey of 500+ developers)

How do devs see AI impact productivity across SPACE

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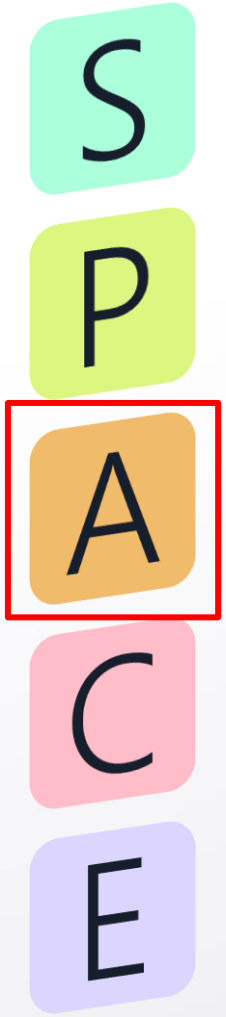
Lesson 1: Look for impact from many **angles**

Lesson 2: **Ask** your developers — they know best

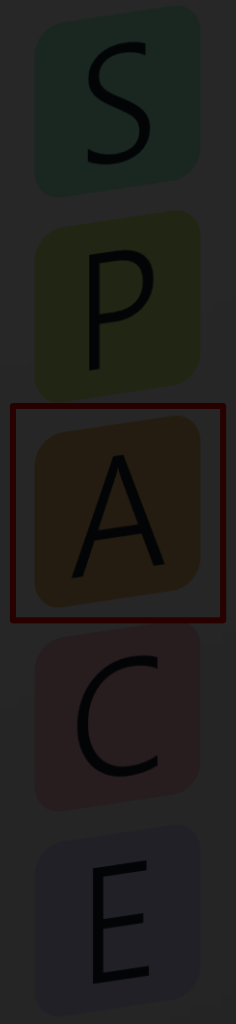
Source: (a not-yet-published survey of 500+ developers)

… but Engineering leaders want *objective* data too!



Studies have shown that coding assistants can decrease the time it takes to complete development tasks by up to **56%** and increase total code throughput (Peng et al. 2023)

… but Engineering leaders want *objective* data too!

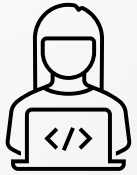


Lesson 3:

Objective truth can be **misunderstood**

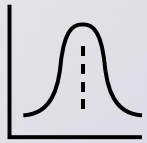
Studies have shown that coding assistants can decrease the time it takes to complete development tasks by up to **56%** and increase total code throughput (Peng et al. 2023)

Highlighting two misunderstandings of how devs work



15%

Average time-per-day that developers spend “coding”
(Meyer et al. 2019)



The complexity of tasks varies dramatically

In your own words, how has the use of AI tools impacted your productivity?

*"...it's mainly useful for **small tasks** like code typing prediction, PR summary generation, meeting notes & summaries, etc."*

*"It's mostly a time-saver for the cases where I'm doing something **repetitive**..."*

*"It takes care of so much **tedious** work!"*

*"It often keeps me focused for longer because I don't get bogged down with **repetitive mundane tasks** and instead outsource them to AI tools."*

*"I've been able to hand-off fundamentally **simple but repetitive** [tasks] to AI."*

*"Reduce time on **repetitive or tedious tasks**."*

Source: (a not-yet-published survey of 500+ developers)

In your own words, how has the use of AI tools impacted your productivity?

*"...I'm still stuck solving all the **hard problems**."*

"I don't find [AI tools] *particularly useful for **complex** situation"*

*"It definitely isn't perfect, especially for anything **complex**...*

Source: (a not-yet-published survey of 500+ developers)

Do we get better as we learn?

How often a developer uses AI

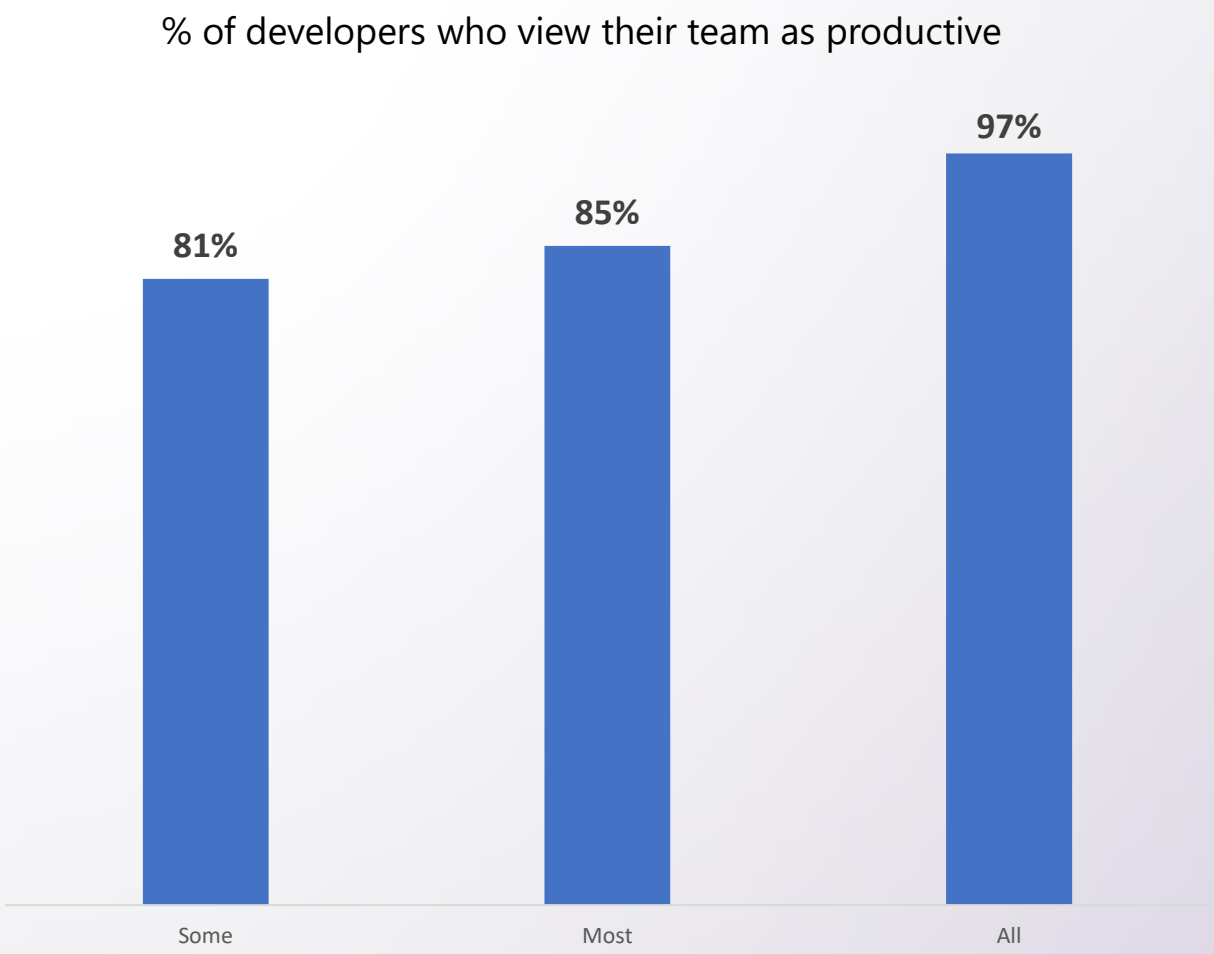
Average agreement rating for whether AI improves productivity

Developers who use AI more frequently, feel more strongly that it positively impacts their productivity.

It is unclear the direction of the relationship.

Source: (a not-yet-published survey of 500+ developers)

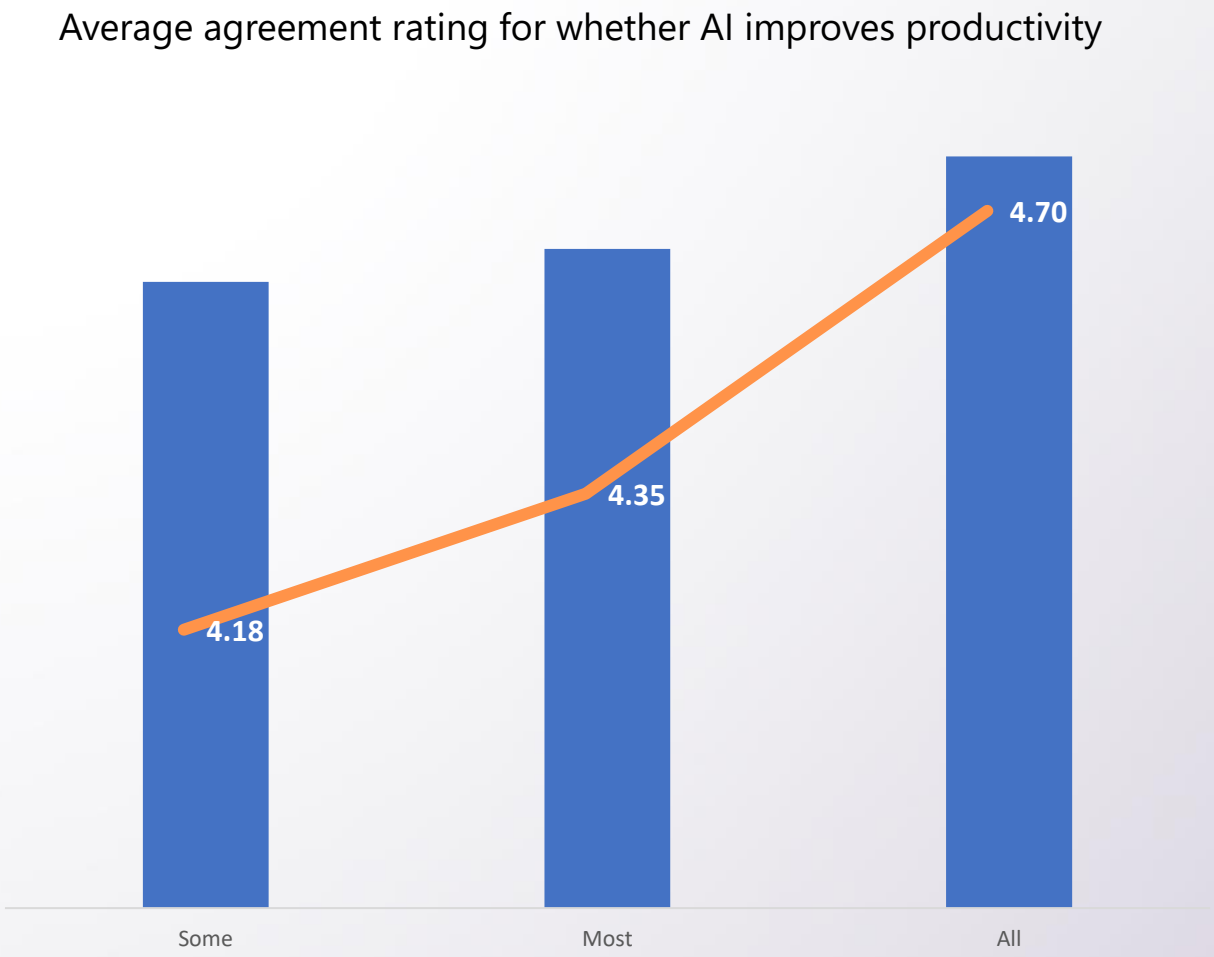
A team is more than the sum of its parts



Developers on teams where more of their peers regularly use AI are more likely to view their team as productive.

Source: (a not-yet-published survey of 500+ developers)

A team is more than the sum of its parts



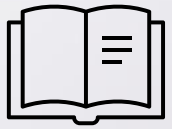
Developers on teams where more of their peers regularly use AI are more likely to view their team as productive.

… and their confidence that AI is improving their personal productivity increases too!

Source: (a not-yet-published survey of 500+ developers)

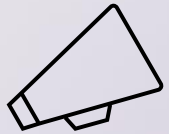
Teams can increase impact AI tools can have on developer productivity…

Increased confidence from developers that AI boosted their productivity:



+3%

Team provides documentation on best practices for using AI



+9%

Team advocates for the use of AI

* - Statistically significant at $p \leq 0.05$

Source: (a not-yet-published survey of 500+ developers)

Teams can increase impact AI tools can have on developer productivity…

Increased confidence from developers that AI boosted their productivity:

+3%

Team provides documentation on best practices for using AI

Lesson 4:
Universal truths are hard to find

+9%

Team advocates for the use of AI

* - Statistically significant at $p \leq 0.05$

Source: (a not-yet-published survey of 500+ developers)

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Ok, but what specific metrics are you using?!?

… the same ones I've been using to measure everything else!

Time-To-First-PR

Time-To-Mitigate

Code Review Time

PR Completion Time

Uninterrupted Focus Time

ES Satisfaction (NSAT)

Incidents

Ok, but what specific metrics are you using?!?

… the same ones I've been using to measure everything else!

Lesson 5:
Stick to your **metrics** — different problems, same principles

Time-To-First-PR

Time-To-Mitigate

Code Review Time

PR Completion Time

Uninterrupted Focus Time

ES Satisfaction (NSAT)

Incidents

What do I think I know?

1. Regularly using AI to complete your tasks makes you more productive.
2. Regularly using AI makes you more productive across multiple dimensions.
3. The more people on your team that use AI, the more productive they appear to be.
4. The more people on your team that use AI, the better you are able to leverage AI.
5. The more often your use AI, the better you are able to leverage AI.
6. Offering training, documentation, and evangelism will improve the outcomes on your team.

In the end, no matter how advanced our tools, every problem is a human problem