Distinguished Paper Award

ICSE 2026 Rio de Janeiro | Brazil

"*Maybe We Need Some More Examples:*"

Individual and Team Drivers of Developer GenAI Tool Use

Wednesday, April 15th, 2026

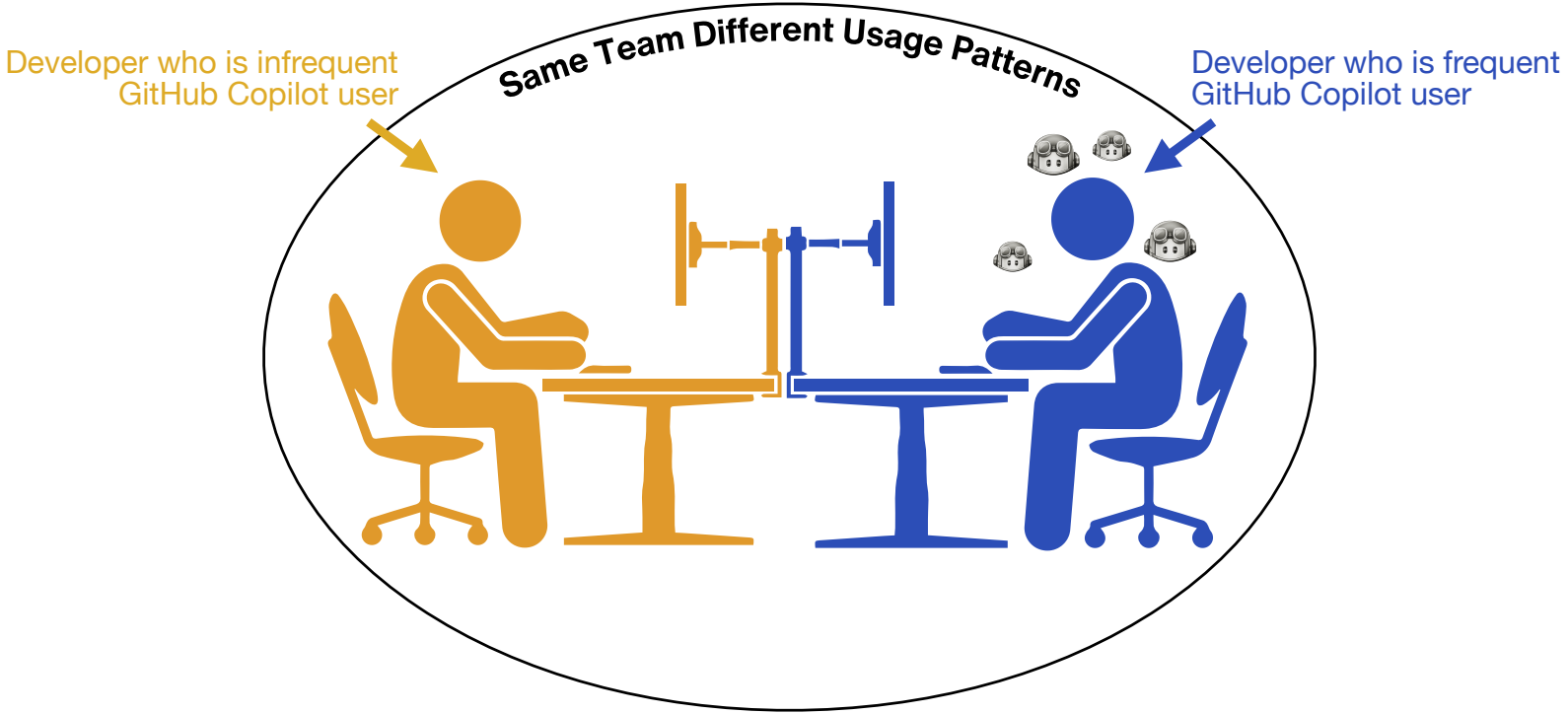
Courtney Miller, Rudrajit Choudhuri, Mara Ulloa, Sankeerti Haniyur, Robert DeLine, Margaret-Anne Storey, Emerson Murphy-Hill, Christian Bird, Jenna L. Butler

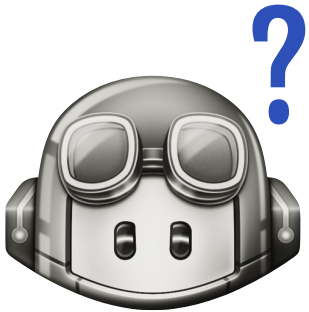
Carnegie Mellon University · Microsoft Research · University of Victoria · Oregon State University · Northwestern University

Paper

Infographic

Despite Widespread Availability Adoption Remains Uneven





What individual factors distinguish frequent and infrequent users of GenAI development tools?

Methods

Results

Discussion & Implications

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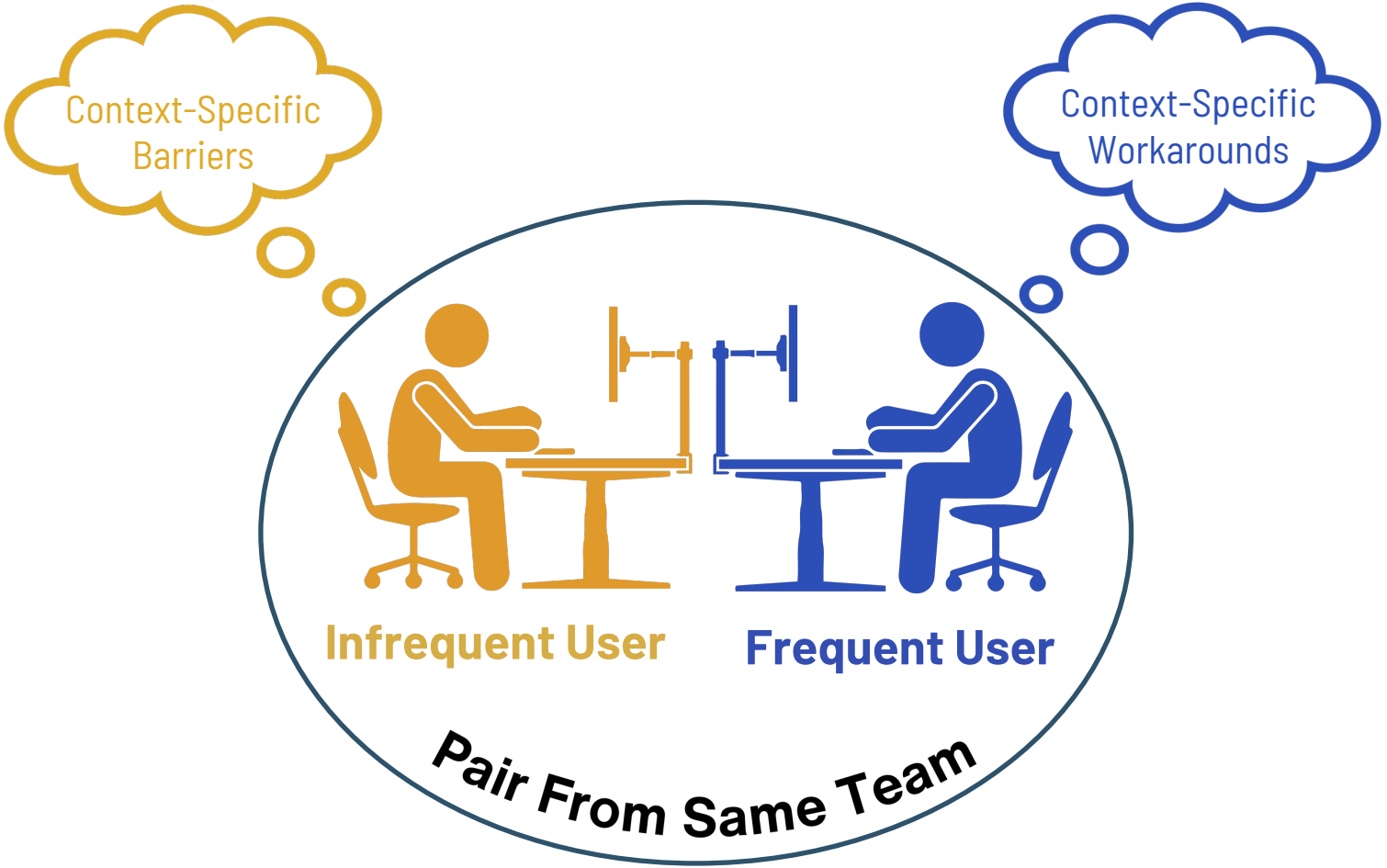
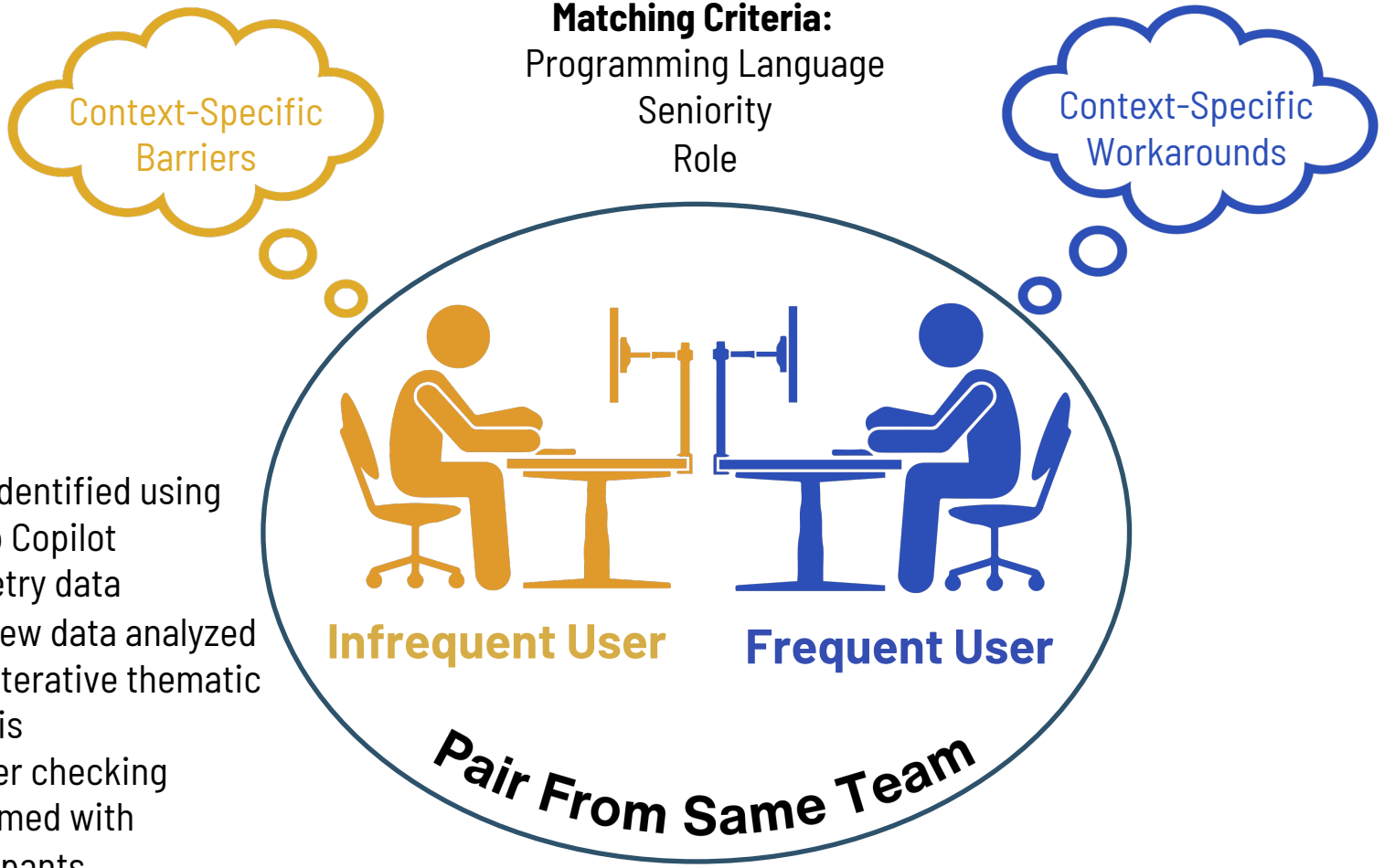

Context-Specific Barriers
Context-Specific Workarounds
Infrequent User
Frequent User
Pair From Same Team

Matching Criteria:
Programming Language
Seniority
Role

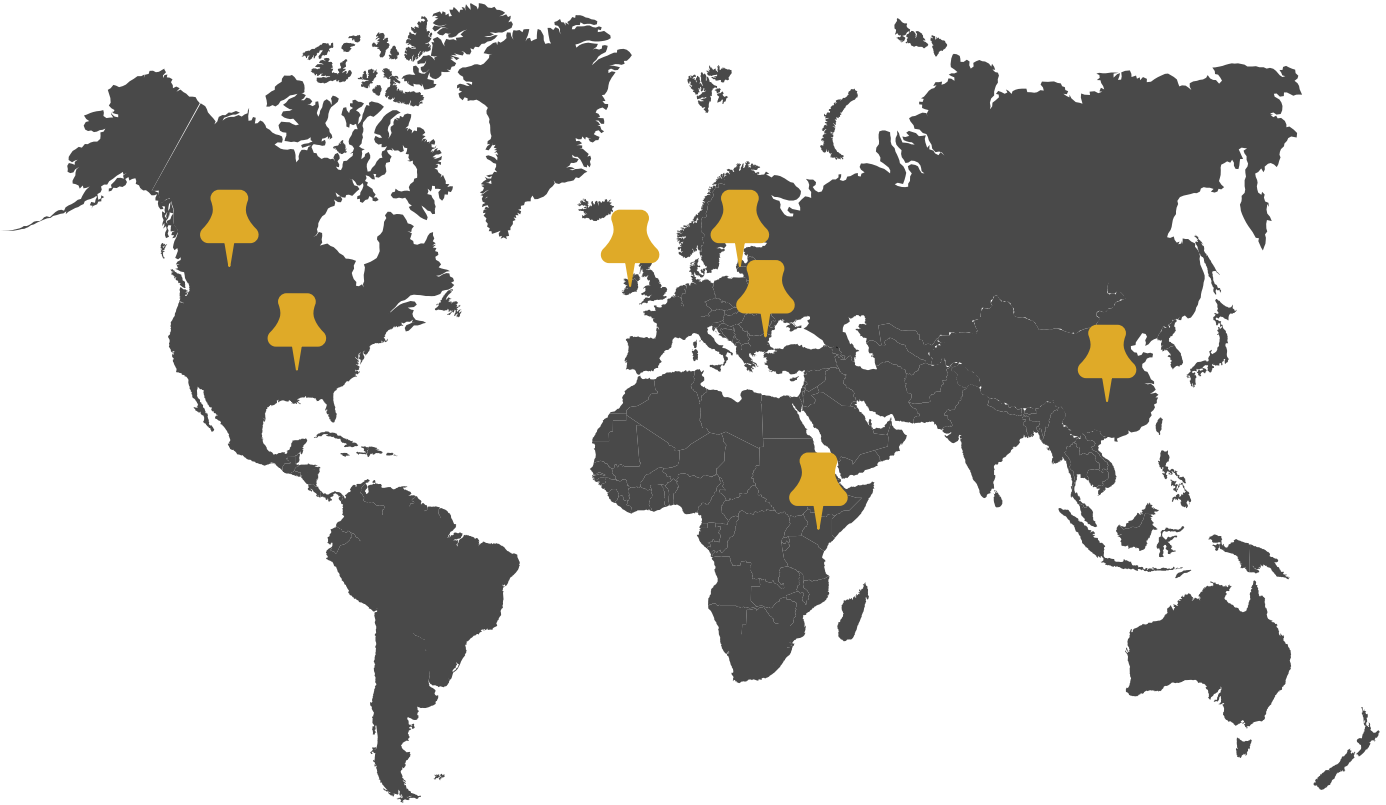


- Pairs identified using GitHub Copilot telemetry data
- Interview data analyzed using iterative thematic analysis
- Member checking performed with participants

Same: Codebase + Manager + Team Policies

We Spoke to Pairs of Developers From Teams Globally

n = 54 developers -> 27 matched pairs



Ethical Considerations for Study Design

Given Microsoft's culture of heavily prompting GenAI adoption, we implemented multiple safeguards to protect participants' wellbeing and privacy

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Framed study as exploring *'diverse developer experiences with GenAI tools'*

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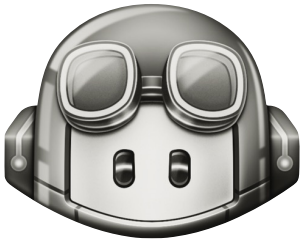
Ensuring Non-Judgmental Interview Environments

Vetted questions for neutrality, interviewer emphasized confidentiality & anonymity

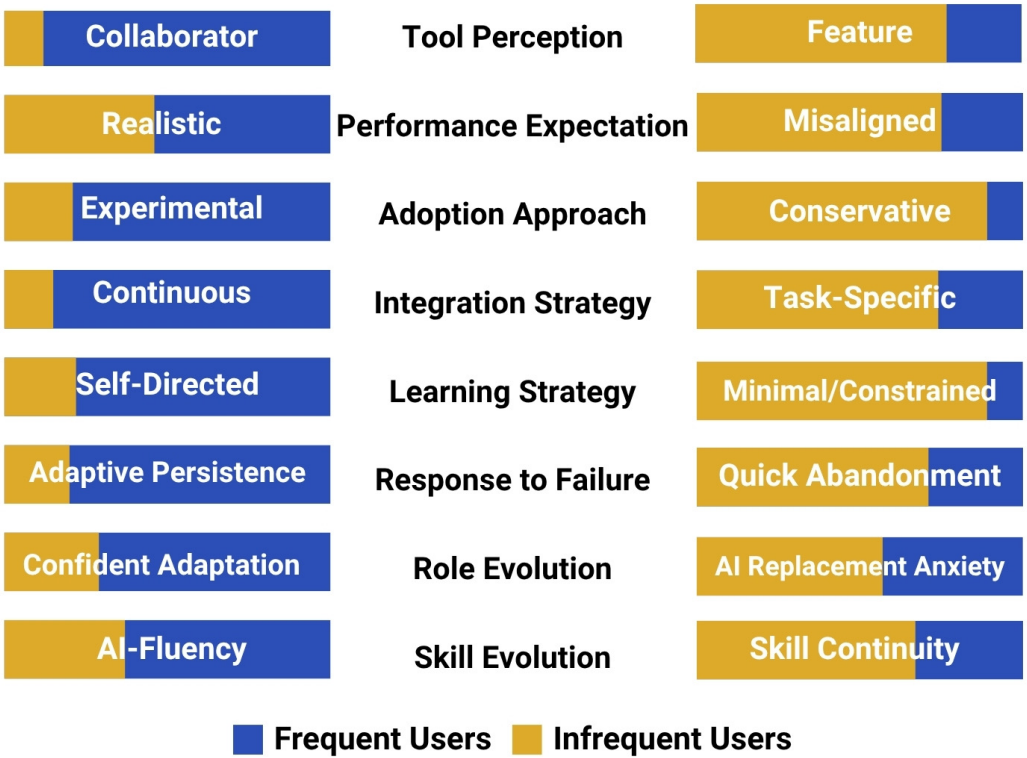
Methods



Results

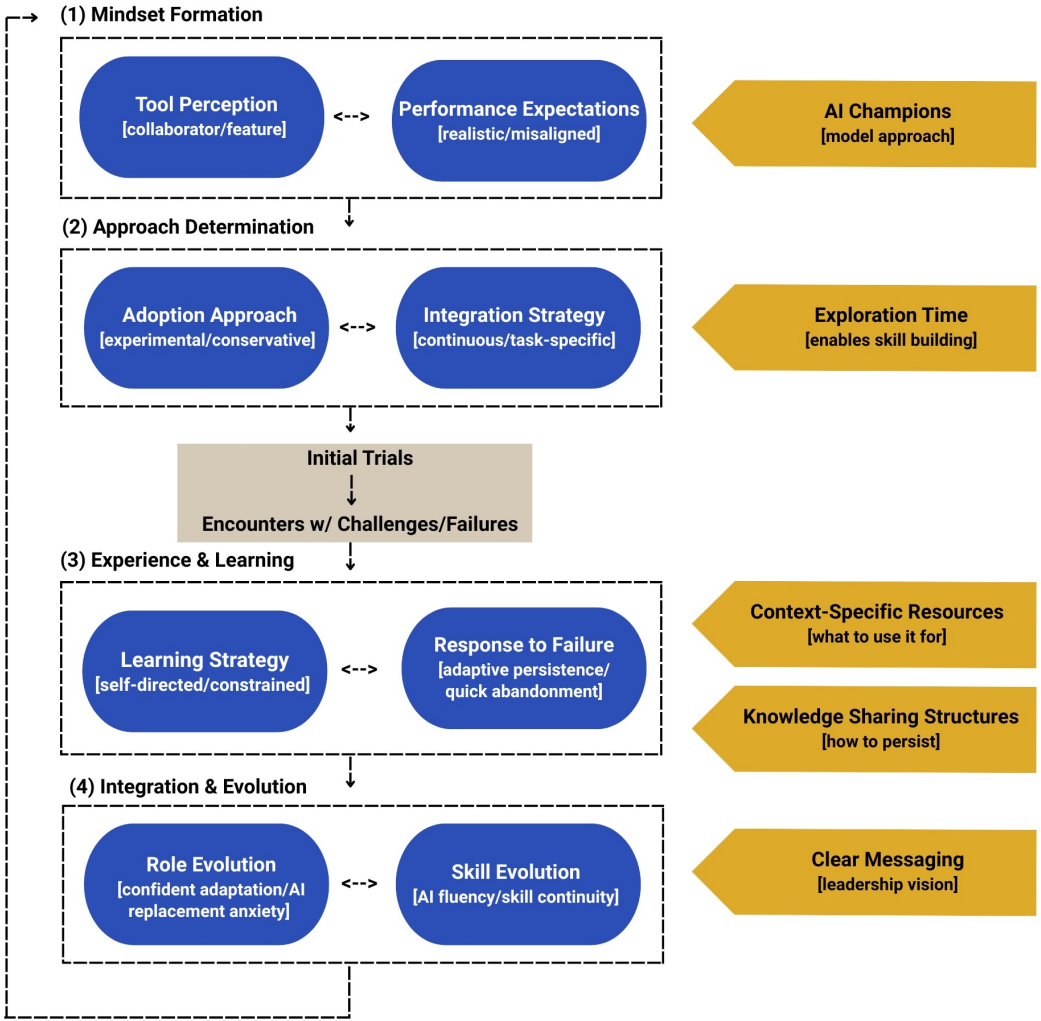
Discussion &
Implications

Usage patterns diverge based on mindset and approach



We identified distinct patterns in how frequent and infrequent users **perceive**, **approach working with**, and **respond to challenges** using GenAI development tools

Even among developers in similar organizational contexts



Team Support Can Make a Difference for Some

Emergent findings reveal that team and organizational factors appear to actively shape individual factors that impact adoption for some developers

* Note: Note all developers were influenced by team and organizational factors equally

Organizational Factors Can Amplify Adoption Differences

E.g., Knowledge sharing structures -> demonstrate how to overcome challenges

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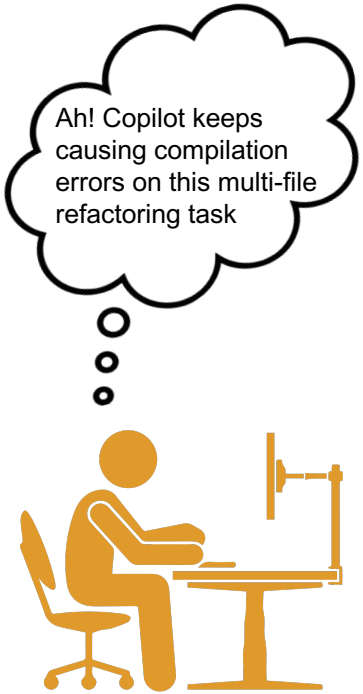

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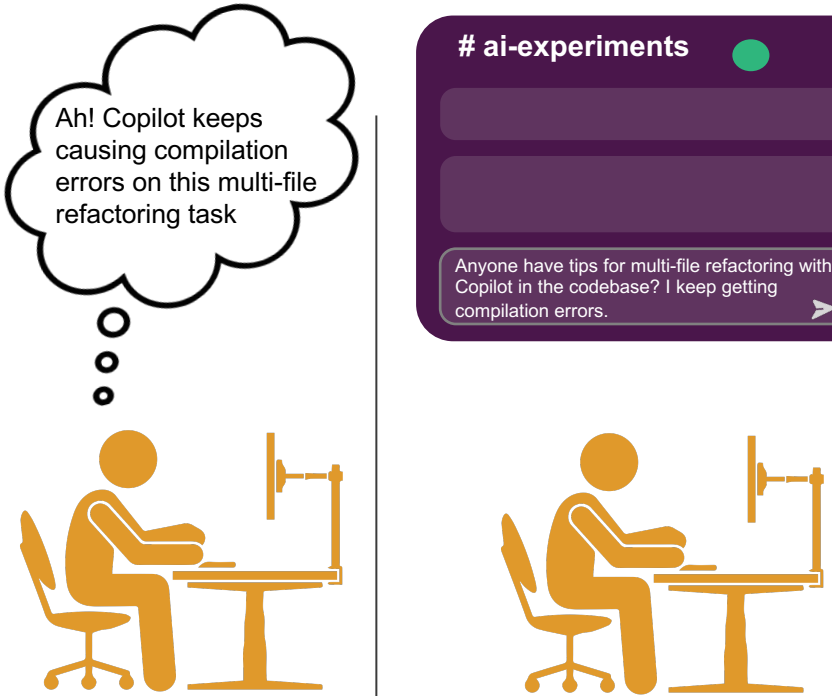

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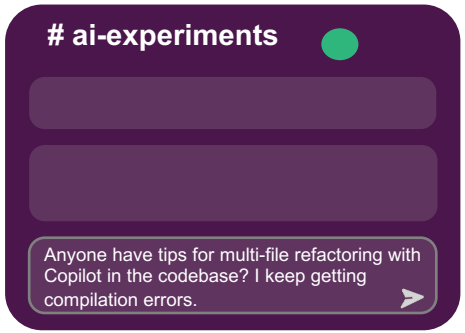

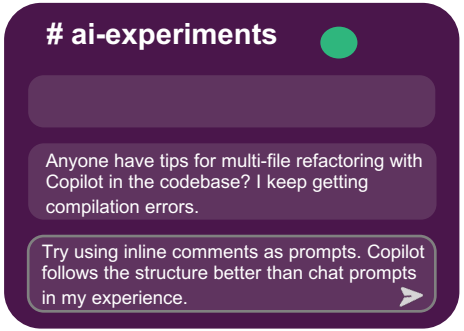

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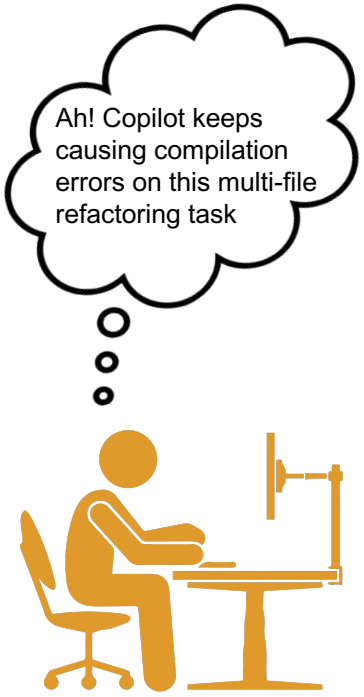
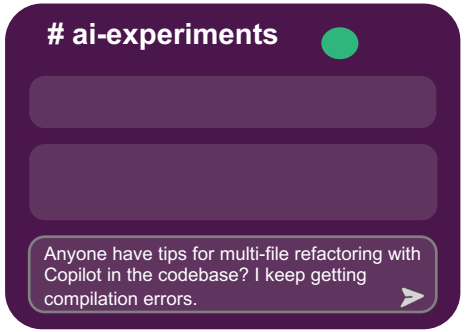
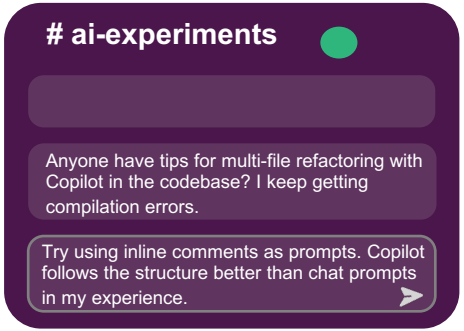
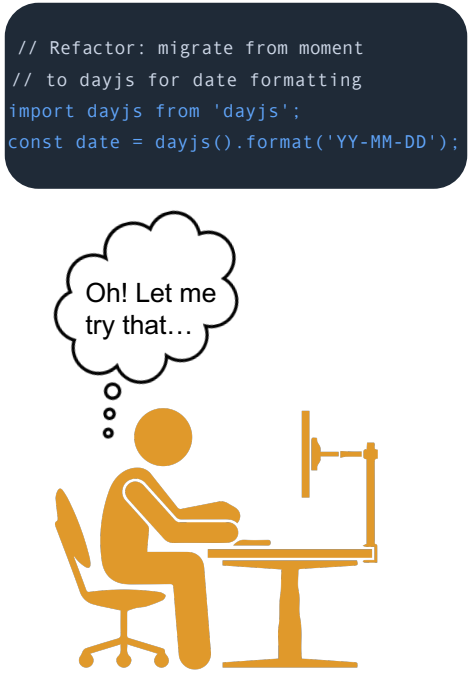
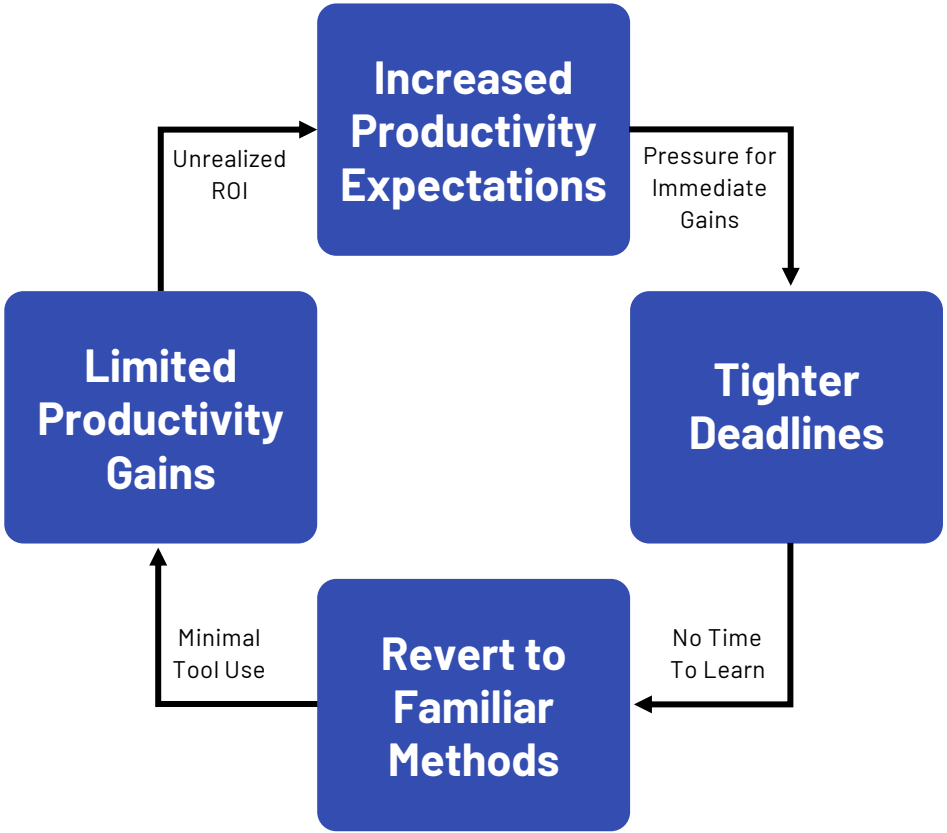




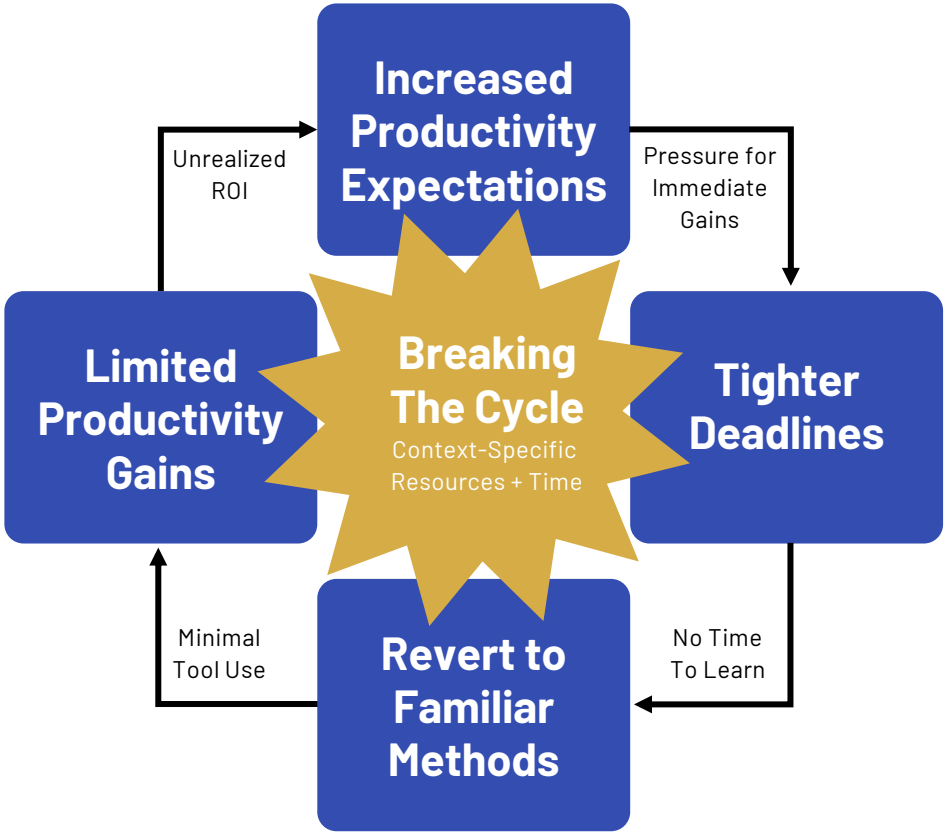




Unexpected Interactions: Time, Expectations, And Developing Proficiency



These findings challenge the prevailing GenAI deployment strategy across the software industry, which places the responsibility of determining how to integrate tooling to yield expected productivity gains on individual developers



The Productivity Pressure Paradox

Increased productivity expectations from management without corresponding support creates a paradoxical effect, where developers lack the time necessary to develop the skills that would save time.

Methods

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Systematic Productivity Optimizations Require a Systematic Approach– Not Just Adding More Resources

"Deploy & Figure It Out"

Many orgs invest in GenAI tools expecting systematic productivity optimizationss while treating integration as an individual responsibility

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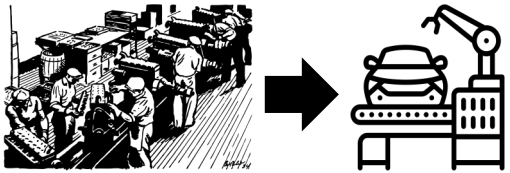

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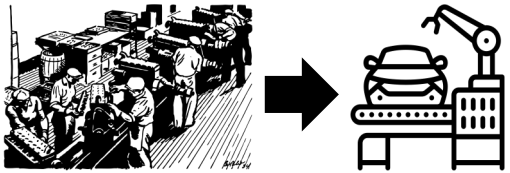

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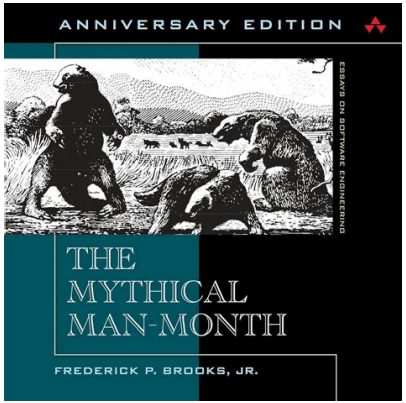

Adding developers to a late project increases complexity without corresponding capability. To gain efficiency, better systems are needed

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Better Systems Are Needed

Adding GenAI without corresponding support creates new coordination challenges and learning requirements

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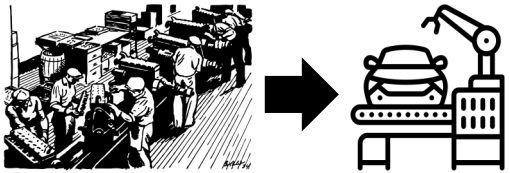

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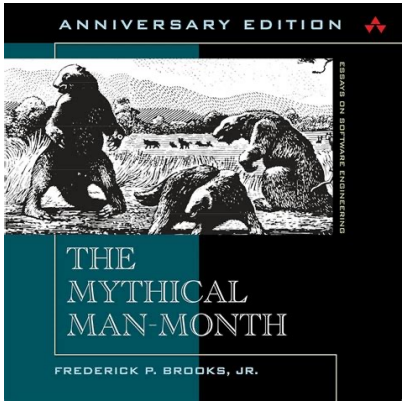

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For Orgs: Increase Productivity By Increasing Support

A Shift In Responsibility

The responsibility for achieving systematic productivity optimizations should be shifted away from individuals and back toward systems

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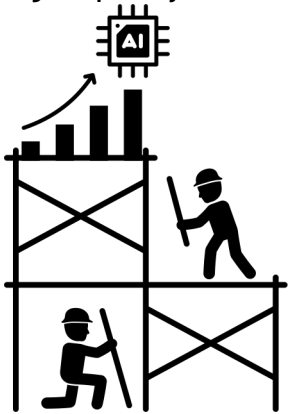

vs

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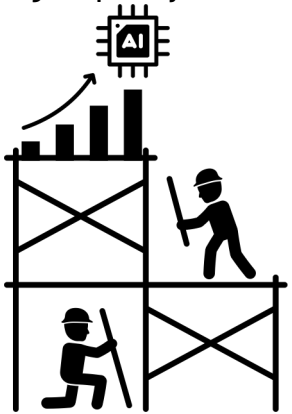

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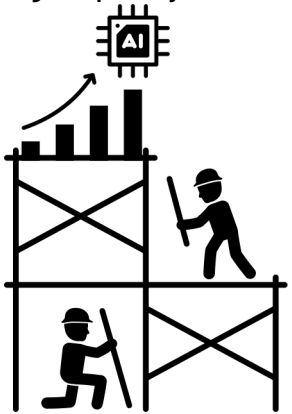

VS

Table 2: Evidence-Based Team Interventions for AI Tool Adoption

Intervention	Target Stage	Mechanism	Implementation Examples
Clear Organizational Messaging	Mindset Formation	Sets expectations; legitimizes exploration	Leadership demos; documented value propositions; success metrics
AI Tool Champions	Approach Determination	Models usage; provides guidance; reduces risk	1–2 designated team experts with 10% time allocation for peer support
Context-Specific Use Cases	Experience & Learning	Translates capabilities to team workflows	Team wiki with domain examples from actual repositories
Knowledge Sharing Infrastructure	Experience & Learning	Accelerates learning; normalizes challenges	Dedicated channel; "AI wins/fails" in standups; pair programming
Protected Learning Time	Throughout	Enables pressure-free experimentation	"AI Fridays"; sprint time allocation; hackathons
Collaborative Sessions	Experience & Learning	Transforms individual struggles to team learning	Weekly demos; monthly challenges; brown bags

In Summary

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- We identified distinct patterns in how frequent and infrequent users **perceive**, **approach**, and **respond to challenges**
- Team & org interventions appear to actively shape individual factors that impact adoption for some developers
- Our findings imply widespread expectations for rapid productivity gains without sufficient support creates a **Productivity Pressure Paradox**, undermining the productivity gains that motivate adoption

Paper

Infographic

We have stickers!

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@CourtneyElta

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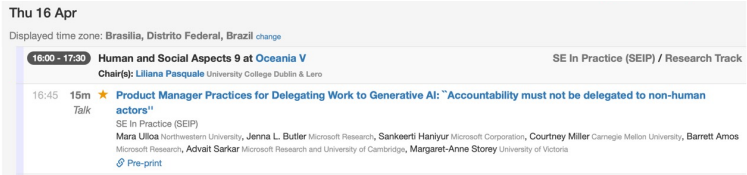
Thu 16 Apr

Displayed time zone: Brasilia, Distrito Federal, Brazil change

16:00 - 17:30 Human and Social Aspects 9 at Oceania V — SE In Practice (SEIP) / Research Track

Chair(s): Liliana Pasquale University College Dublin & Lero

16:45 15m Talk ★ Product Manager Practices for Delegating Work to Generative AI: "Accountability must not be delegated to non-human actors"

SE In Practice (SEIP)

Mara Ulloa Northwestern University, Jenna L. Butler Microsoft Research, Sankeerti Haniyur Microsoft Corporation, Courtney Miller Carnegie Mellon University, Barrett Amos Microsoft Research, Advait Sarkar Microsoft Research and University of Cambridge, Margaret-Anne Storey University of Victoria

Pre-print

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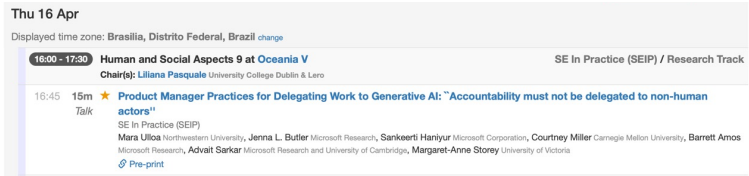

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