

# Agentic AI in Software Engineering: tools or team members?

## Validating a Taxonomy of Agentic AI in Software Engineering.

This questionnaire aims to validate a taxonomy of Agentic AI in Software Engineering, focusing on clarity correctness, completeness, perceived impact, risks, and time horizon. The survey targets experts in Software Engineering and AI.

We identified three proactivity levels (Passive, Reactive, Proactive) and three interaction roles (Questioning, Team-member, Manager) of Agentic AI in SE, as summarized in the table below.

\* Indicates required question

## Classification of Agentic AI by behavioral capabilities and organizational role

	Questioning Role	Team-member Role	Manager Role
Passive	<b>Passive &amp; Questioning Agents.</b> Execute user commands or hardcoded behavior when invoked and engage in interaction with humans to provide a better service. <u>Example:</u> Code or documentation generators that establish a dialogue to better fit user needs.	<b>Passive &amp; Team-member Agents.</b> Execute user commands when invoked and can understand and engage in complex social and interpersonal dynamics of a human team. <u>Example:</u> Passive support agents triggered to clarify requirements or summarize discussions, adapting communication to team needs without acting autonomously.	<b>Passive &amp; Manager Agents.</b> <u>Not applicable:</u> managerial roles require initiative beyond passive, on-demand interaction.
Reactive	<b>Reactive &amp; Questioning Agents.</b> Respond to environmental stimuli using predefined rules or behaviors, engaging with humans to provide a better service. <u>Example:</u> Reactive CI agents monitoring repository events or build results and applying predefined policies to adjust configurations or trigger corrective actions.	<b>Reactive &amp; Team-member Agents.</b> Interactive collaborators that respond to stimuli, ask clarifications, and react to team needs through context-aware communication. <u>Example:</u> Requirements engineering agents monitoring discussions or issue trackers and reacting to changes by asking clarifying questions and identifying ambiguities or conflicts.	<b>Reactive &amp; Manager Agents.</b> Supervisory agents that respond to stimuli by assigning tasks, monitoring progress, and reacting to project events. <u>Example:</u> Coordination agents that detect delayed tasks or failing builds, reallocate tasks, update sprint plans, notify team members, and escalate issues when needed.
Proactive	<b>Proactive &amp; Questioning Agents.</b> Autonomous agents that observe, plan, and act without explicit triggers; they can also ask clarifying questions when uncertainty arises. <u>Example:</u> Self-adaptive testing agents that continuously monitor changes and autonomously adapt testing strategies, generating or modifying tests and querying developers when needed.	<b>Proactive &amp; Team-member Agents.</b> Fully autonomous teammates that proactively collaborate, adapt to context, and support shared team goals through continuous contributions. <u>Example:</u> Autonomous development partners that monitor repositories, issues, and documentation, propose design alternatives, contribute code or tests, update documentation, and initiate discussions to align decisions.	<b>Proactive &amp; Manager Agents.</b> Advanced manager agents that plan, coordinate, allocate resources, oversee quality, and manage projects end-to-end. <u>Example:</u> Project management agents integrating issue trackers, version control, CI/CD, testing, and communication tools to plan iterations, assign or reassign tasks, enforce standards, monitor quality signals, and coordinate releases with escalation to humans.

## SECTION 0 — Background & Expertise


This section provides some useful background information to contextualize your answers.

## 1. Q0.1 — Professional role \*

*Tick all that apply.*

- ☐ Academic researcher (SE / AI / HCI / related)
- ☐ Industry practitioner (developer, architect, DevOps, etc.)
- ☐ Engineering manager / technical lead
- ☐ Product or project manager
- ☐ AI researcher / ML engineer
- ☐ Other: \_\_\_\_\_

## 2. Q0.2 — Years of experience in Software Engineering \*

 Dropdc*Mark only one oval.*

- ☐ No experience
- ☐ Less than 1 year
- ☐ 1–2 years
- ☐ 3–5 years
- ☐ 6–10 years
- ☐ More than 10 years

## 3. Q0.4 — Familiarity with agentic or autonomous AI concepts \*

*Mark only one oval.*

- ☐ Not familiar
- ☐ Somewhat familiar
- ☐ Familiar
- ☐ Very familiar / Expert

## SECTION 2.1 — Passive & Questioning Agents

**Passive and Questioning Agents** respond only when invoked and interact through dialogue to improve task outcomes.

**Example:** Code or documentation generators: to produce documentation that better fits the needs, documentation generators establish a dialogue with humans.

**Reported benefits:** increased productivity and time savings; support for learning and skill development; improved accessibility for less experienced developers; reduced anxiety and higher motivation; greater user satisfaction and well-being.

**Reported risks:** over-reliance and reduced independent reasoning; shallow or incorrect learning; security, IP, bias, and data-leakage risks; reduced code quality and higher operational and energy costs.

**Reported changes:** greater reliance on AI-mediated inquiry; human focus on high-level design decisions; prompt-based requirements engineering; and the need for new practices in auditability, accountability, fairness, and transparency.

## SECTION 2.1 — Passive & Questioning Agents

### Passive & Questioning Agents

*Definition:* Respond only when invoked and interact through dialogue to improve task outcomes.

*Example:* Code or documentation generators that establish a dialogue with humans to better fit user needs.

Aspect	Summary
<b>Benefits</b>	<ul style="list-style-type: none"> <li>Increased productivity and time savings</li> <li>Support for learning and skill development</li> <li>Improved accessibility for less experienced developers</li> <li>Reduced anxiety and higher motivation</li> <li>Greater user satisfaction and well-being</li> </ul>
<b>Risks</b>	<ul style="list-style-type: none"> <li>Over-reliance and reduced independent reasoning</li> <li>Shallow or incorrect learning</li> <li>Security, IP, bias, and data-leakage risks</li> <li>Reduced code quality</li> <li>Higher operational and energy costs</li> </ul>
<b>Changes</b>	<ul style="list-style-type: none"> <li>Greater reliance on AI-mediated inquiry</li> <li>Human focus on high-level design decisions</li> <li>Prompt-based requirements engineering</li> <li>Need for new practices in auditability, accountability, fairness, and transparency</li> </ul>

## 4. Q2.1.1 — Correctness of benefits

\*

The listed benefits for these Agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 5. Q2.1.2 — Correctness of risks

\*

The listed risks for these Agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 6. Q2.1.3 — Correctness of changes

\*

The described changes to Software Engineering practices are plausible and realistic.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

### 7. Q2.1.4 — Research relevance

These agents represent an important research direction for the Software Engineering community.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

### 8. Q2.1.5 — Practical relevance

These agents are likely to have significant impact on real-world Software Engineering practice

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

### 9. Q2.1.6 — Severity of risks

★

If the identified risks materialize, how severe would their impact be?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

10. Q2.1.7 — Likelihood of risks

\*

How likely are these risks to occur in practice?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

11. Q2.1.8 — Time horizon

How likely are these type of agents (with their risks, benefits and changes) to occur in practice?

*Mark only one oval.*

- ☐ Already mainstream
- ☐ Within 1–3 years
- ☐ Within 3–5 years
- ☐ More than 5 years
- ☐ Unlikely / never

12. Q2.1.9 — Qualitative feedback

Are any benefits, risks, or changes missing, overstated, or unclear for these agents?

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## SECTION 2.2 — Passive & Team-member Agents

**Passive and Team-member Agents** provide contextual assistance when explicitly triggered and can participate in social and interpersonal team interactions.

**Example:** Passive support agents that, when explicitly triggered, assist developers by clarifying requirements, summarizing discussions, by adapting their communication to the team's needs without acting autonomously.

**Reported benefits:** contextual support in collaborative work; clarification and synthesis that enhance shared understanding; mediation in cross-disciplinary collaboration; improved inclusivity, efficiency, and creativity while maintaining human initiative.

**Reported risks:** erosion of review culture and misalignment with team practices; misunderstandings or misinformation during mediation; reduced knowledge internalization and peer-to-peer learning; and delegation of team sense-making to agents.

**Reported changes:** the need to train engineers to collaborate effectively with AI colleagues; and shifts in learning-by-doing and debugging cultures.

## SECTION 2.2 — Passive & Team-member Agents

### Passive & Team-member Agents

*Definition:* Provide contextual assistance when explicitly triggered and participate in social and interpersonal team interactions.

*Example:* Passive support agents that clarify requirements, summarize discussions, and adapt communication to team needs without acting autonomously.

Aspect	Summary
<b>Benefits</b>	<ul style="list-style-type: none"> <li>Contextual support in collaborative work</li> <li>Clarification and synthesis enhancing shared understanding</li> <li>Mediation in cross-disciplinary collaboration</li> <li>Improved inclusivity, efficiency, and creativity</li> <li>Maintains human initiative</li> </ul>
<b>Risks</b>	<ul style="list-style-type: none"> <li>Erosion of review culture and misalignment with team practices</li> <li>Misunderstandings or misinformation during mediation</li> <li>Reduced knowledge internalization and peer-to-peer learning</li> <li>Delegation of team sense-making to agents</li> </ul>
<b>Changes</b>	<ul style="list-style-type: none"> <li>Need to train engineers to collaborate effectively with AI colleagues</li> <li>Shifts in learning-by-doing and debugging cultures</li> </ul>

13. Q2.2.1 — Correctness of benefits

\*

The listed benefits for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

14. Q2.2.2 — Correctness of risks

\*

The listed risks for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

15. Q2.2.3 — Correctness of changes

\*

The described changes to Software Engineering practices are plausible and realistic.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree



## 16. Q2.2.4 — Research relevance

These agents represent an important research direction for the Software Engineering community.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 17. Q2.2.5 — Practical relevance

These agents are likely to have significant impact on real-world Software Engineering practice.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 18. Q2.2.6 — Severity of risks

\*

If the identified risks materialize, how severe would their impact be?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

19. Q2.2.7 — Likelihood of risks

\*

How likely are these risks to occur in practice?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

20. Q2.2.8 — Time horizon

How likely are these type of agents (with their risks, benefits and changes) to occur in practice?

*Mark only one oval.*

- ☐ Already mainstream
- ☐ Within 1–3 years
- ☐ Within 3–5 years
- ☐ More than 5 years
- ☐ Unlikely / never

21. Q2.2.9 — Qualitative feedback

Are any benefits, risks, or changes missing, overstated, or unclear for these agents?

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## SECTION 2.3 — Reactive & Questioning Agents

**Reactive and Questioning Agents** respond to environmental stimuli (e.g., errors, events, or feedback) using predefined behaviors and engage in dialogue when triggered.

**Example:** Reactive Continuous Integration (CI) agents that monitor repository events, build results and react to failures or resource constraints by adjusting build or deployment configurations, or by triggering corrective actions to keep the pipeline running reliably.

**Reported benefits:** event-driven support for inquiry and reasoning; increased responsiveness and contextual learning at critical moments; refocusing human effort on creative and strategic tasks; orchestration across repositories, APIs, and databases; and maintenance of shared understanding through dialogue.

**Reported risks:** delayed or deferred human reasoning until agent intervention; and reinforcement of passive cognitive patterns leading to skill atrophy.

**Reported changes:** the emergence of event-driven AI support in development workflows; and expanded agent roles in reactive coordination and orchestration.

## SECTION 2.3 — Reactive & Questioning Agents

### Reactive & Questioning Agents

*Definition:* Respond to environmental stimuli using predefined behaviors and engage in dialogue when triggered.

*Example:* Reactive CI agents monitoring repository events and build results to trigger corrective actions.

Aspect	Summary
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Event-driven support for inquiry and reasoning</li> <li>• Increased responsiveness and contextual learning</li> <li>• Refocusing human effort on creative and strategic tasks</li> <li>• Orchestration across repositories, APIs, and databases</li> <li>• Maintenance of shared understanding through dialogue</li> </ul>
<b>Risks</b>	<ul style="list-style-type: none"> <li>• Delayed or deferred human reasoning until agent intervention</li> <li>• Reinforcement of passive cognitive patterns and skill atrophy</li> </ul>
<b>Changes</b>	<ul style="list-style-type: none"> <li>• Emergence of event-driven AI support in development workflows</li> <li>• Expanded agent roles in reactive coordination and orchestration</li> </ul>

22. Q2.3.1 — Correctness of benefits

\*

The listed benefits for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

23. Q2.3.2 — Correctness of risks

\*

The listed risks for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

24. Q2.3.3 — Correctness of changes

\*

The described changes to Software Engineering practices are plausible and realistic.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 25. Q2.3.4 — Research relevance

These agents represent an important research direction for the Software Engineering community.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 26. Q2.3.5 — Practical relevance

These agents are likely to have significant impact on real-world Software Engineering practice.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 27. Q2.3.6 — Severity of risks

\*

If the identified risks materialize, how severe would their impact be?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

28. Q2.3.7 — Likelihood of risks

\*

How likely are these risks to occur in practice?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

29. Q2.3.8 — Time horizon

How likely are these type of agents (with their risks, benefits and changes) to occur in practice?

*Mark only one oval.*

- ☐ Already mainstream
- ☐ Within 1–3 years
- ☐ Within 3–5 years
- ☐ More than 5 years
- ☐ Unlikely / never

30. Q2.3.9 — Qualitative feedback

Are any benefits, risks, or changes missing, overstated, or unclear for these agents?

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## SECTION 2.4 — Reactive & Team-member Agents

**Reactive and Team-member Agents** collaborate with humans by responding to events and team needs, supporting coordination and communication.

**Example:** Requirement engineering agents that monitor project discussions, issue trackers, and evolving specifications - and react to changes by asking clarifying questions, identifying ambiguities or conflicts, and supporting requirement elicitation through context-aware interaction and communication with stakeholders.

**Reported benefits:** continuous event-driven coordination in socio-technical teams; mediation across roles and disciplines; fewer collaboration breakdowns and reduced frustration; improved emotional well-being; and faster collaborative debugging and error correction.

**Reported risks:** erosion of empathy, informal communication, and peer mentoring; challenges to sustaining professional expertise; marginalization of socially complex debugging practices; reduced information sharing and situational awareness; and increased social and productivity pressure.

**Reported changes:** shifts in team interaction and information-sharing patterns; reduced reliance on traditional learning practices; and greater emphasis on explicitly maintained shared mental models.

## SECTION 2.4 — Reactive & Team-member Agents

### Reactive & Team-member Agents

*Definition:* Collaborate with humans by responding to events and team needs, supporting coordination and communication.

*Example:* Requirement engineering agents that monitor project discussions, issue trackers, and evolving specifications, and react to changes by asking clarifying questions, identifying ambiguities or conflicts, and supporting requirement elicitation through context-aware interaction.

Aspect	Summary
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Continuous event-driven coordination in socio-technical teams</li> <li>• Mediation across roles and disciplines</li> <li>• Reduced collaboration breakdowns and frustration</li> <li>• Improved emotional well-being</li> <li>• Faster collaborative debugging and error correction</li> </ul>
<b>Risks</b>	<ul style="list-style-type: none"> <li>• Erosion of empathy, informal communication, and peer mentoring</li> <li>• Challenges to sustaining professional expertise</li> <li>• Marginalization of socially complex debugging practices</li> <li>• Reduced information sharing and situational awareness</li> <li>• Increased social and productivity pressure</li> </ul>
<b>Changes</b>	<ul style="list-style-type: none"> <li>• Shifts in team interaction and information-sharing patterns</li> <li>• Reduced reliance on traditional learning practices</li> <li>• Greater emphasis on explicitly maintained shared mental models</li> </ul>

31. Q2.4.1 — Correctness of benefits

\*

The listed benefits for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

32. Q2.4.2 — Correctness of risks

\*

The listed risks for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

33. Q2.4.3 — Correctness of changes

\*

The described changes to Software Engineering practices are plausible and realistic.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree



#### 34. Q2.4.4 — Research relevance

These agents represent an important research direction for the Software Engineering community.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

#### 35. Q2.4.5 — Practical relevance

These agents are likely to have significant impact on real-world Software Engineering practice.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

#### 36. Q2.4.6 — Severity of risks

\*

If the identified risks materialize, how severe would their impact be?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

37. Q2.4.7 — Likelihood of risks

\*

How likely are these risks to occur in practice?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

38. Q2.4.8 — Time horizon

How likely are these type of agents (with their risks, benefits and changes) to occur in practice?

*Mark only one oval.*

- ☐ Already mainstream
- ☐ Within 1–3 years
- ☐ Within 3–5 years
- ☐ More than 5 years
- ☐ Unlikely / never

39. Q2.4.9 — Qualitative feedback

Are any benefits, risks, or changes missing, overstated, or unclear for these agents?

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## SECTION 2.5 — Reactive & Manager Agents

**Reactive and Manager Agents** supervise work by responding to project events, assigning tasks, reallocating resources, and escalating issues as needed.

**Example:** Coordination agents that monitor repositories, issue trackers, and CI/CD pipelines - and react to events such as delayed tasks or failing builds by reallocating tasks, updating plans, or escalating issues to humans when needed.

**Reported benefits:** improved coordination and alignment across teams; support for cross-disciplinary mediation and operational flow management; increased efficiency through workload redistribution; and reduced routine workload for developers.

**Reported risks:** heightened surveillance and machine-driven performance pressure; fairness and merit-attribution concerns; unequal access to effective systems; reduced situational awareness due to limited explainability; and accountability risks from AI-mediated managerial decisions.

**Reported changes:** managerial practices shifting toward AI-assisted orchestration; the need to train engineers to work under AI management; restructuring of merit and reward systems; and the development of governance frameworks to address responsibility gaps.

## SECTION 2.5 — Reactive & Manager Agents

### Reactive & Manager Agents

*Definition:* Supervise work by responding to project events, assigning tasks, reallocating resources, and escalating issues as needed.

*Example:* Coordination agents monitoring repositories, issue trackers, and CI/CD pipelines to detect delays or failures, reallocate tasks, update sprint plans, notify team members, and escalate issues when necessary.

Aspect	Summary
Benefits	<ul style="list-style-type: none"> <li>Improved coordination and alignment across teams</li> <li>Support for cross-disciplinary mediation and operational flow management</li> <li>Increased efficiency through workload redistribution</li> <li>Reduced routine workload for developers</li> </ul>
Risks	<ul style="list-style-type: none"> <li>Heightened surveillance and machine-driven performance pressure</li> <li>Fairness and merit-attribution concerns</li> <li>Unequal access to effective systems</li> <li>Reduced situational awareness due to limited explainability</li> <li>Accountability risks from AI-mediated managerial decisions</li> </ul>
Changes	<ul style="list-style-type: none"> <li>Managerial practices shifting toward AI-assisted orchestration</li> <li>Need to train engineers to work under AI management</li> <li>Restructuring of merit and reward systems</li> <li>Development of governance frameworks to address responsibility gaps</li> </ul>

40. Q2.5.1 — Correctness of benefits

\*

The listed benefits for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

41. Q2.5.2 — Correctness of risks

\*

The listed risks for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

42. Q2.5.3 — Correctness of changes

\*

The described changes to Software Engineering practices are plausible and realistic.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

#### 43. Q2.5.4 — Research relevance

These agents represent an important research direction for the Software Engineering community.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

#### 44. Q2.5.5 — Practical relevance

These agents are likely to have significant impact on real-world Software Engineering practice.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

#### 45. Q2.5.6 — Severity of risks

\*

If the identified risks materialize, how severe would their impact be?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

46. Q2.5.7 — Likelihood of risks



How likely are these risks to occur in practice?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

47. Q2.5.8 — Time horizon

How likely are these type of agents (with their risks, benefits and changes) to occur in practice?

*Mark only one oval.*

- ☐ Already mainstream
- ☐ Within 1–3 years
- ☐ Within 3–5 years
- ☐ More than 5 years
- ☐ Unlikely / never

48. Q2.5.9 — Qualitative feedback

Are any benefits, risks, or changes missing, overstated, or unclear for these agents?

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## SECTION 2.6 — Proactive & Questioning Agents

**Proactive and Questioning Agents** autonomously observe, plan, and act without explicit triggers, while interacting with humans to clarify uncertainty.

**Example:** Self-adaptive testing agents that continuously monitor code changes and test results and proactively adjust testing strategies, for example by adding, modifying, or deprioritizing tests. When uncertainty arises, they interact with developers to clarify testing goals and maintain continuous quality assurance.

**Reported benefits:** anticipatory clarification and early intervention; sustained cognitive and creative support; contextual learning at critical moments; autonomous orchestration of socio-technical resources; and guided learning, reduced stress, and support for novices.

**Reported risks:** reduced trial-and-error and reflective learning; passive acceptance of agent solutions; over-automation of reasoning and diminished sense-making; skill atrophy; and unclear responsibility for agent-initiated actions.

**Reported changes:** acceleration toward AI-driven inquiry workflows; greater reliance on orchestration and prompt-based interaction; and the need for robust, human-centered governance mechanisms.

## SECTION 2.6 — Proactive & Questioning Agents

### Proactive & Questioning Agents

*Definition:* Autonomously observe, plan, and act without explicit triggers, while interacting with humans to clarify uncertainty.

*Example:* Self-adaptive testing agents that continuously monitor changes and runtime behavior, adapt testing strategies, generate or modify tests, and interact with developers to clarify requirements or testing goals when uncertainty arises.

Aspect	Summary
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Anticipatory clarification and early intervention</li> <li>• Sustained cognitive and creative support</li> <li>• Contextual learning at critical moments</li> <li>• Autonomous orchestration of socio-technical resources</li> <li>• Guided learning and reduced stress for novices</li> </ul>
<b>Risks</b>	<ul style="list-style-type: none"> <li>• Reduced trial-and-error and reflective learning</li> <li>• Passive acceptance of agent solutions</li> <li>• Over-automation of reasoning and diminished sense-making</li> <li>• Skill atrophy</li> <li>• Unclear responsibility for agent-initiated actions</li> </ul>
<b>Changes</b>	<ul style="list-style-type: none"> <li>• Acceleration toward AI-driven inquiry workflows</li> <li>• Greater reliance on orchestration and prompt-based interaction</li> <li>• Need for robust, human-centered governance mechanisms</li> </ul>

49. Q2.6.1 — Correctness of benefits

\*

The listed benefits for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

50. Q2.6.2 — Correctness of risks

\*

The listed risks for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

51. Q2.6.3 — Correctness of changes

\*

The described changes to Software Engineering practices are plausible and realistic.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree



## 52. Q2.6.4 — Research relevance

These agents represent an important research direction for the Software Engineering community.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 53. Q2.6.5 — Practical relevance

These agents are likely to have significant impact on real-world Software Engineering practice.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 54. Q2.6.6 — Severity of risks

\*

If the identified risks materialize, how severe would their impact be?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

55. Q2.6.7 — Likelihood of risks

\*

How likely are these risks to occur in practice?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

56. Q2.6.8 — Time horizon

How likely are these type of agents (with their risks, benefits and changes) to occur in practice?

*Mark only one oval.*

- ☐ Already mainstream
- ☐ Within 1–3 years
- ☐ Within 3–5 years
- ☐ More than 5 years
- ☐ Unlikely / never

57. Q2.6.9 — Qualitative feedback

Are any benefits, risks, or changes missing, overstated, or unclear for these agents?

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## SECTION 2.7 — Proactive & Team-member Agents

**Proactive and Team-member Agents** act as autonomous collaborators, supporting coordination, learning creativity, and shared team goals.

**Example:** Autonomous development partner agents that continuously monitor project artifacts and proactively propose design alternatives, contribute code or tests, update documentation, and initiate discussions with developers to align on decisions and shared team goals.

**Reported benefits:** socio-technical coordination and cross-role mediation; enhanced emotional well-being and collective learning; improved knowledge sharing and documentation; sustained creative focus; and tutoring for novices alongside reflective partnership for experts.

**Reported risks:** erosion of human-centered collaboration practices; loss of collective sense-making and cultural transmission; over-reliance and deskilling; weakened care structures, empathy, and emotional reassurance; and increased productivity pressure with diluted responsibility.

**Reported changes:** a shift toward human–AI pairing and renewed pair programming; expanded conversational interaction models; transformation of team interaction and learning practices; and a stronger need for explicitly maintained shared mental models.

## SECTION 2.7 — Proactive & Team-member Agents

### Proactive & Team-member Agents

*Definition:* Act as autonomous collaborators, supporting coordination, learning, creativity, and shared team goals.

*Example:* Autonomous development partner agents that monitor project artifacts and proactively propose design alternatives, contribute code or tests, update documentation, and initiate discussions to align decisions.

Aspect	Summary
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Socio-technical coordination and cross-role mediation</li> <li>• Enhanced emotional well-being and collective learning</li> <li>• Improved knowledge sharing and documentation</li> <li>• Sustained creative focus</li> <li>• Tutoring for novices and reflective partnership for experts</li> </ul>
<b>Risks</b>	<ul style="list-style-type: none"> <li>• Erosion of human-centered collaboration practices</li> <li>• Loss of collective sense-making and cultural transmission</li> <li>• Over-reliance and deskilling</li> <li>• Weakened care structures, empathy, and emotional reassurance</li> <li>• Increased productivity pressure with diluted responsibility</li> </ul>
<b>Changes</b>	<ul style="list-style-type: none"> <li>• Shift toward human–AI pairing and renewed pair programming</li> <li>• Expanded conversational interaction models</li> <li>• Transformation of team interaction and learning practices</li> <li>• Stronger need for explicitly maintained shared mental models</li> </ul>

58. Q2.7.1 — Correctness of benefits

\*

The listed benefits for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

59. Q2.7.2 — Correctness of risks

\*

The listed risks for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

60. Q2.7.3 — Correctness of changes

\*

The described changes to Software Engineering practices are plausible and realistic.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 61. Q2.7.4 — Research relevance

These agents represent an important research direction for the Software Engineering community.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 62. Q2.7.5 — Practical relevance

These agents are likely to have significant impact on real-world Software Engineering practice.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 63. Q2.7.6 — Severity of risks



If the identified risks materialize, how severe would their impact be?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

64. Q2.7.7 — Likelihood of risks

\*

How likely are these risks to occur in practice?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

65. Q2.7.8 — Time horizon

How likely are these type of agents (with their risks, benefits and changes) to occur in practice?

*Mark only one oval.*

- ☐ Already mainstream
- ☐ Within 1–3 years
- ☐ Within 3–5 years
- ☐ More than 5 years
- ☐ Unlikely / never

66. Q2.7.9 — Qualitative feedback

Are any benefits, risks, or changes missing, overstated, or unclear for these agents?

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## SECTION 2.8 — Proactive & Manager Agents

**Proactive and Manager Agents** autonomously plan, coordinate, allocate resources, and manage projects end-to-end.

**Example:** Project management agents that maintain a global view of the project and proactively plan iterations, allocate tasks and resources, monitor quality, and coordinate releases, escalating critical decisions to humans when needed.

**Reported benefits:** initiative-driven, end-to-end coordination and planning; proactive task and resource allocation; early identification of organizational inefficiencies; improved communication and alignment; and more efficient workload redistribution.

**Reported risks:** heightened surveillance and performance pressure; fairness and merit-attribution concerns; reduced situational awareness due to opacity; and accountability and responsibility gaps.

**Reported changes:** managerial practices shifting toward AI-assisted orchestration; the need to train engineers to work under AI management; restructuring of reward and merit systems; and the establishment of explicit governance, transparency, and human oversight mechanisms.

## SECTION 2.8 — Proactive & Manager Agents

### Proactive & Manager Agents

*Definition:* Autonomously plan, coordinate, allocate resources, and manage projects end-to-end.

*Example:* Project management agents integrating issue trackers, version control, CI/CD, testing, and communication tools to plan iterations, assign tasks, allocate resources, monitor quality, coordinate releases, and escalate critical decisions to humans.

Aspect	Summary
<b>Benefits</b>	<ul style="list-style-type: none"> <li>Initiative-driven, end-to-end coordination and planning</li> <li>Proactive task and resource allocation</li> <li>Early identification of organizational inefficiencies</li> <li>Improved communication and alignment</li> <li>More efficient workload redistribution</li> </ul>
<b>Risks</b>	<ul style="list-style-type: none"> <li>Heightened surveillance and performance pressure</li> <li>Fairness and merit-attribution concerns</li> <li>Reduced situational awareness due to opacity</li> <li>Accountability and responsibility gaps</li> </ul>
<b>Changes</b>	<ul style="list-style-type: none"> <li>Managerial practices shifting toward AI-assisted orchestration</li> <li>Need to train engineers to work under AI management</li> <li>Restructuring of reward and merit systems</li> <li>Establishment of explicit governance, transparency, and human oversight mechanisms</li> </ul>

67. Q2.8.1 — Correctness of benefits

\*

The listed benefits for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

68. Q2.8.2 — Correctness of risks

\*

The listed risks for these agents are accurate and well-supported.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

69. Q2.8.3 — Correctness of changes

\*

The described changes to Software Engineering practices are plausible and realistic.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree



## 70. Q2.8.4 — Research relevance

These agents represent an important research direction for the Software Engineering community.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 71. Q2.8.5 — Practical relevance

These agents are likely to have significant impact on real-world Software Engineering practice.

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

## 72. Q2.8.6 — Severity of risks

\*

If the identified risks materialize, how severe would their impact be?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

73. Q2.8.7 — Likelihood of risks

\*

How likely are these risks to occur in practice?

*Mark only one oval.*

	1	2	3	4	5	
Stro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

74. Q2.8.8 — Time horizon

How likely are these type of agents (with their risks, benefits and changes) to occur in practice?

*Mark only one oval.*

- ☐ Already mainstream
- ☐ Within 1–3 years
- ☐ Within 3–5 years
- ☐ More than 5 years
- ☐ Unlikely / never

75. Q2.8.9 — Qualitative feedback

Are any benefits, risks, or changes missing, overstated, or unclear for these agents?

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## SECTION 3 — Cross-Cutting Comparison & Ranking

## 76. Q3.1 — Impact ranking

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Rank agent types by expected impact on Software Engineering (1 = highest impact)

Mark only one oval per row.

	1 (Highest impact)	2	3	4	5	6	7	8 (Lowest impact)
<b>Passive &amp; Questioning</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Passive &amp; Team-member</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Reactive &amp; Questioning</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Reactive &amp; Team-member</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Reactive &amp; Manager</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Proactive &amp; Questioning</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Proactive &amp; Team-member</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Proactive &amp; Manager</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 77. Q3.2 — Highest-risk agent types (select up to 3) \*

*Tick all that apply.*

- ☐ Passive & Questioning
- ☐ Passive & Team-member
- ☐ Reactive & Questioning
- ☐ Reactive & Team-member
- ☐ Reactive & Manager
- ☐ Proactive & Questioning
- ☐ Proactive & Team-member
- ☐ Proactive & Manager

## 78. Q3.3 — Research priority (select up to 3) \*

*Tick all that apply.*

- ☐ Passive & Questioning
- ☐ Passive & Team-member
- ☐ Reactive & Questioning
- ☐ Reactive & Team-member
- ☐ Reactive & Manager
- ☐ Proactive & Questioning
- ☐ Proactive & Team-member
- ☐ Proactive & Manager

## 79. Q4.1 — Final comments

Any additional comments, critiques, or suggestions?

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80. If you are available for followup questions or clarification, please leave your email below

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