Magic Quadrant pour les assistants de code IA

19 août 2024 - ID G00808075 - 50 min de lecture

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Les assistants de code IA améliorent l'efficacité des développeurs de logiciels, minimisent la charge cognitive, amplifient la résolution de problèmes, accélèrent leur rythme d'apprentissage, stimulent la créativité et maintiennent leur fluidité. Utilisez cette étude pour comparer les fournisseurs d'assistants de code IA et trouver la solution idéale pour votre organisation.

Hypothèses de planification stratégique

D'ici 2027, le nombre d'équipes d'ingénierie de plateforme utilisant l'IA pour augmenter chaque phase du cycle de vie du développement logiciel (SDLC) sera passé de 5 % à 40 %.

D'ici 2027, 80 % des entreprises auront intégré des outils de test augmentés par l'IA dans leur chaîne d'outils d'ingénierie logicielle, ce qui représente une augmentation significative par rapport aux 15 % environ du début de 2023.

D'ici 2027, 25 % des défauts logiciels s'échappant vers la production résulteront d'un manque de surveillance humaine du code généré par l'IA, ce qui représente une augmentation majeure par rapport à moins de 1% en 2023.

D'ici 2028, 90 % des ingénieurs logiciels d'entreprise utiliseront des assistants de code IA, contre moins de 14 % début 2024

D'ici 2028, l'utilisation de l'IA générative (GenAI) réduira le coût de modernisation des applications existantes de 30 % par rapport aux niveaux de 2023.

Définition/Description du marché

Gartner définit les assistants de code IA comme des outils facilitant la génération et l'analyse du code et de la configuration des logiciels. Ces assistants utilisent des modèles fondamentaux, tels que les grands modèles de langage (LLM), optimisés pour le code, les technologies de compréhension de programme ou une combinaison des deux. Les développeurs de logiciels les invitent à générer, analyser, déboguer, corriger et refactoriser le code, à créer de la documentation et à traduire le code entre les langages. Les assistants de code s'intègrent aux outils de développement tels que les éditeurs de code, les terminaux en ligne de commande et les interfaces de chat. Certains peuvent être personnalisés en fonction de la base de code et de la documentation spécifiques à l'entreprise.

Les assistants de code IA peuvent améliorer l'expérience d'un développeur de logiciels en augmentant l'efficacité, en accélérant le développement d'applications, en minimisant la surcharge cognitive, en amplifiant les compétences de résolution de problèmes, en accélérant le rythme d'apprentissage, en favorisant la créativité et en maintenant l'état de flux .

Caractéristiques obligatoires

Les caractéristiques obligatoires pour ce marché comprennent :

- Complétion de code à partir du langage naturel (par exemple, commentaire).

- Complétion de code multiligne, remplissage au milieu, avec possibilité de brancher des intégrations pour plusieurs éditeurs de code.

- Capacité à utiliser l'assistant de code dans plusieurs écosystèmes de fournisseurs.

- Garantir que les modèles de base ne seront pas formés sur le code ou la documentation du client (à l'exclusion des réglages fins approuvés).

- Interface de chat conversationnelle intégrée à l'environnement de développement.

Caractéristiques communes

Les caractéristiques communes de ce marché incluent :

- Instance sur site ou cloud privé.

- Tableaux de bord d'analyse qui suivent les taux d'adoption des utilisateurs, les taux d'acceptation du code et d'autres mesures pour mesurer l'impact.

- Prise en charge de plusieurs langues naturelles (telles que l'anglais, l'espagnol, l'hindi, le chinois, etc.).

- Complétion de code dans un terminal (interface de ligne de commande).

- Formé sur plusieurs langages de programmation, avec Java, JavaScript, Python et C# au minimum.

- Personnalisation de la base de code de l'entreprise.

- Filtres pour le code biaisé, le langage explicite et les images.

- Capacité à citer des projets sources publics pour les fragments de code générés qui correspondent aux données de formation.

Quadrant magique

Figure 1 : Quadrant magique des assistants de code IA

Points forts et précautions du fournisseur

Alibaba Cloud

Alibaba Cloud est un challenger dans ce Magic Quadrant. Son produit, TONGYI Lingma , vise à accompagner les développeurs dans leurs tâches d'IA. Ses activités sont principalement concentrées en Chine et sa clientèle est généralement composée de grandes entreprises diversifiées. Alibaba Cloud se concentre sur l'intégration de son assistant de code IA à ses produits cloud et à ses outils DevOps, et sur son évolution vers un système multi-agents.

Points forts

- Alibaba Cloud favorise efficacement l'adoption par les utilisateurs grâce à une stratégie de marque agressive et à une version gratuite pour renforcer la réputation de ses produits. L'entreprise s'appuie sur son important réseau commercial existant pour recommander l'assistant de code IA et renforce sa présence sur de nouveaux segments de marché en développant des partenariats avec des éditeurs de logiciels indépendants.

- Alibaba Cloud intègre TONGYI Lingma à ses autres produits cloud et outils DevOps, tout en offrant des fonctionnalités telles que les systèmes multi-agents , le codage collaboratif et la compréhension contextuelle qui améliorent l'utilité et l'efficacité de l'outil. Grâce à une collecte de commentaires approfondie, à un processus d'intégration structuré et à des partenariats stratégiques avec des entreprises comme Accenture, Deloitte et KPMG, Alibaba Cloud améliore en permanence son assistant de code IA et offre un support de mise en œuvre fiable.

- La disponibilité historique des services d'Alibaba Cloud pour TONGYI Lingma est de 99,9 %. L'entreprise propose une politique de mise à niveau transparente et compatible avec les évolutions futures, garantissant une fiabilité élevée et des interruptions de service minimales. Le fournisseur dispose d'un centre de service à Singapour, de quatre centres de service régionaux et de 16 équipes de service locales, qui assurent un service client 24h/24 et 7j/7 dans le monde entier. De plus, sa stratégie d'hébergement différenciée propose des services SaaS multi-locataires sur le cloud public et des instances dédiées au sein d'un réseau de cloud privé virtuel (VPC), garantissant ainsi la sécurité et la confidentialité des données pour les moyennes et grandes entreprises.

Précautions

- Alibaba Cloud propose actuellement TONGYI Lingma uniquement en Chine continentale . Alibaba Cloud ne propose pas d'options de configuration des préférences linguistiques pour TONGYI Lingma , ni de prise en charge multilingue dans sa documentation et son interface utilisateur . Cela limite la convivialité et l'attrait de son produit hors de Chine .

- Les nouveaux clients peuvent ne pas être au courant de l'offre d'Alibaba Cloud, car elle manque d'indicateurs d'engagement détaillés, de stratégies de marketing d'influence et de techniques d'optimisation pour les moteurs de recherche (SEO) telles que l'optimisation des mots clés, le backlinking et le SEO technique. Les efforts marketing d'Alibaba Cloud ont une portée mondiale limitée, se concentrant principalement sur la promotion de Baidu en Chine.

- Alibaba Cloud se concentre principalement sur des fonctionnalités générales, tout en s'appuyant sur ses partenaires de services pour fournir des connaissances et des stratégies sectorielles spécifiques. Bien qu'Alibaba Cloud ait présenté des initiatives visant à accroître sa part de marché dans certains segments verticaux, ces plans ne comprennent pas d'exemples concrets de collaboration avec des partenaires sectoriels.

Amazon Web Services

Amazon Web Services (AWS) est leader dans ce Magic Quadrant. Son produit, Amazon Q Developer (anciennement Codewhisperer), vise à assister et automatiser les tâches des développeurs grâce à l'IA. Par exemple, Q Developer facilite la suggestion et la transformation de code, les tests et la sécurité, ainsi que le développement de fonctionnalités. Ses opérations sont géographiquement diversifiées et ses clients sont de toutes tailles. AWS se concentre sur la fourniture de solutions basées sur l'IA qui optimisent le cycle de vie du développement logiciel (SDLC), automatisent les tâches complexes, optimisent les performances, garantissent la sécurité et stimulent l'innovation.

Points forts

- Le produit AWS offre un support complet tout au long du cycle de développement logiciel (SDLC). Il propose des suggestions de code en temps réel et une analyse des vulnérabilités, et automatise des tâches complexes, comme la mise à niveau de plus de 1 000 applications de production de Java 8 vers Java 17 en seulement deux jours . AWS présente également des innovations telles que les compilateurs neuronaux et les modèles de raisonnement automatisé . Son Conseil Clients fournit un retour d'information continu qui influence le développement des services et l'orientation stratégique d'AWS, notamment l'engagement d'atteindre 100 % d'énergie renouvelable d'ici 2025.

- **Marketing execution:**AWS utilise une approche multidimensionnelle pour optimiser la visibilité d'Amazon Q Developer au sein de la communauté des développeurs. L'entreprise mobilise et informe ses clients grâce à des placements YouTube, du contenu numérique interactif sur des chaînes Twitch comme AWS OnAir, des diffusions télévisées en direct, du contenu optimisé pour le référencement et du marketing d'influence pour mettre en avant les avantages pratiques de son produit. AWS complète ces efforts par des campagnes d'acquisition de clients ciblées.

- **Marketing strategy**Les événements AWS re:Invent et AWS Summit mettent en avant le leadership éclairé, l'innovation et les réussites clients. Son comité consultatif client , ses centres d'information exécutifs, ses roadshows ciblés et sa participation active aux hackathons aident AWS à garantir l'adéquation avec les besoins des clients et à établir des relations solides avec les décideurs clés.

Précautions

- **Sales strategy:** AWS's pricing model involves allocation conditions for the code transformation use case. This model is adequate for most use cases, but can incur additional fees when used with code transformation, due to overage. It also lacks the flexibility of unlimited seats or consumption-based licensing models. AWS provides discounts based on usage and multiyear contracts; however, the details are not as transparent as those provided by other vendors in the market.

- **Product or service:** Amazon Q Developer's deployment options are limited to the AWS cloud. Unlike its competitors, AWS does not support self-hosted environments. Amazon Q Developer's model choices are abstracted and managed by AWS, with no ability for a customer to bring their own model. Its integrated development environment (IDE) support encompasses only Visual Studio, Visual Studio Code, JetBrains Suite, and AWS-specific environments, which falls short of other leading offerings. It has plans to support Eclipse in 2024.

- **Geographic strategy:** AWS primarily provides prompt support in English, although it plans to offer support in other languages. While AWS provides data localization and access controls, it has not yet expanded its infrastructure and services to Asia/Pacific, but has plans to expand to Europe in 2024.

Codeium

Codeium is a Challenger in this Magic Quadrant. Its product, Codeium, is focused on providing an integrated suite of AI-driven development tools — including in-line code suggestions, an in-code chat editor, in-place refactoring, terminal autocomplete and automated code review — that can be deployed as SaaS, self-hosted or hybrid. Its operations are geographically diversified, and its clients tend to be large enterprises across various sectors. Codeium is heavily investing in advanced AI capabilities with its upcoming Cortex reasoning engine, aiming to enhance multistep reasoning and expand its offerings across the SDLC.

- **Product or service:** Codeium shows a commitment to responsible AI by training its models on publicly permissive code and implementing security measures to prevent direct access to the general LLM. Its IDE integration supports a wide range of environments, including Visual Studio Code, Visual Studio, JetBrains Suite, Eclipse, Jupyter, Emacs, Xcode and Vim, along with extensive support for programming languages and frameworks. Its partnership marketplace also integrates with leading code-scanning technologies like Snyk and Sonar.

- **Overall viability:** Codeium has secured considerable venture capital funding, including $65 million raised in January 2024, and a total of $93 million from high-profile investors. Codeium has a large cash reserve and a low burn rate, which provides resilience during economic downturns. Also, it reports a 120% annual contract value retention rate and a 100% customer retention rate, which underscore its ability to maintain and grow its customer base.

- **Operations:** Codeium differentiates itself with an SLA of 99.99% and its flexible deployment models. It offers self-hosted solutions that are easy to deploy, which is unique in the market and has attracted customers in highly regulated sectors like defense, finance and healthcare. It also has hybrid models that combine the benefits of cloud and on-premises deployments. Codeium's upgrade policies are flexible and user-friendly, which minimizes downtime.

Cautions

- **Marketing strategy:** Codeium is highly successful in targeting software developers, but its marketing strategy does not target software quality professionals, software security experts or product managers. Codeium has created visibility for its offering through various channels; however, it lags leaders in conducting industry research, extensively engaging with industry influencers, and participating in high-profile conferences and events attended by enterprise engineering leaders.

- **Market understanding:** Codeium focuses on delivering strong technical enhancements for both software and serving infrastructure, but lags leaders in its understanding of market challenges such as enterprise integration complexities, workforce transformation and user experience.

- **Business model:** Codeium currently has a limited product range and focuses on improving existing products, but also needs to focus on introducing new targeted solutions based on user needs, organizational sizes and industry verticals. It has integrations with knowledge management and security platforms, but lags leaders in its strategy to integrate its LLM with SDLC vendor LLMs. Compared to some vendors in this research, Codeium has fewer full-time employees (FTEs) dedicated to marketing and sales.

CodiumAI

CodiumAI is a Niche Player in this Magic Quadrant. Its products, Codiumate and PR-Agent, are focused on code generation, questions and answers, review, and pull request automation across the SDLC. Its operations are geographically diversified, and its clients tend to be medium to large enterprises, particularly those with stringent data security requirements. CodiumAI is investing in model customization, integration testing and enhanced dashboarding capabilities, with plans to roll out these features in the next 12 months.

Strengths

- **Business model:** With a majority of the team focused on product development, CodiumAI shows a clear commitment to maintaining and improving its offerings. It runs a lean operation, enabling its agility and market responsiveness, with FTEs allocated to marketing and sales. CodiumAI also allows customers to procure its products as separate offerings (instead of a bundle) and does not have performance restrictions like rate limits, which provides more flexibility for specific customer needs.

- **Offering strategy:** CodiumAI strategically invests in refining third-party LLMs, enhancing IDE integrations and extensibility, and developing real-time collaboration features, which underscores its commitment to deliver precise, versatile and team-friendly coding solutions. It has over 100,000 monthly active users of developers on the free edition and hundreds on paid plans. CodiumAI also stands out with its flexible deployment models, offering both on-premises and SaaS options.

- **Operations:** CodiumAI's on-premises offering provides flexibility and control for customers that require solutions to be deployed within their own infrastructure. The company releases seamless, regular upgrades and maintains a consistent level of technical support globally. Its new service releases are easily accessible through various

channels, including the marketplace, GitHub and customer engineering teams for web-based updates.

Cautions

- **Marketing strategy:** CodiumAI targets its marketing at engineering managers and developers without targeting roles like CIOs, CTOs, testers and security professionals. Its marketing has no mention of security or compliance features. CodiumAI does participate in globally impactful conferences, or engage with industry influencers, however, lagging the leaders in this criterion. It also lacks detailed product announcements and has no strategic partnerships to drive innovation.

- **Market responsiveness/record:** CodiumAI's customer feedback mechanisms lag those of leading vendors, as it does not use advisory boards or real-time tools to gather feedback. CodiumAI also lacks a marketplace of solutions for its product and is involved in fewer open-source projects than its competitors.

- **Vertical/industry strategy:** Codium does not have any industry-specific solutions or initiatives, nor does it have any service partners to support industry-specific use cases. It is in the process of onboarding Google Cloud and Microsoft Azure as marketplace partners, having already onboarded AWS Marketplace.

GitHub

GitHub is a Leader in this Magic Quadrant. Its product, GitHub Copilot, focuses on enhancing developer productivity and code quality through AI-powered code suggestions and contextual assistance. Its operations are geographically diversified, and its clients tend to be large organizations across various sectors. GitHub provides GitHub Copilot to active maintainers in the open-source community, as well as teachers and students free of charge. GitHub is expanding Copilot with features like Copilot Workspace for a collaborative AI-native developer environment, Copilot Extensions for seamless tool integration, and enhanced security and compliance.

Strengths

- **Overall viability:** GitHub is a subsidiary of Microsoft. GitHub has an extensive developer community and GitHub Copilot has high user engagement, which enables it to gather feedback quickly and continuously innovate. GitHub's high customer retention rates and

annual contract value retention underscore its ability to maintain and grow its customer base.

- **Vertical/industry strategy:** GitHub has built strong partnerships with leading global systems integrators and has well-defined initiatives across key industries. It delivers tailored solutions that meet the unique needs of industries such as banking, healthcare, technology, professional services and education.

- **Market responsiveness/record:** GitHub uses a diverse array of feedback channels, including customer advisory boards and direct communication with GitHub Copilot product teams, to ensure that user input directly influences product development. It also introduced GitHub Copilot Extensions, which is supported by a growing ecosystem of open-source and commercial partners, to enable developers to build and deploy seamlessly within their preferred environments.

Cautions

- **Sales strategy:** Discounts are only available through Microsoft and not directly through GitHub. GitHub Copilot does support technical debt reduction and legacy code modernization, but does not have as much prominence in GitHub's sales strategy, as it should have.

- **Business model:** GitHub Copilot is priced on a per-user/per-month model, unlike some competitors that offer consumption-based pricing. GitHub Copilot is only available as a SaaS solution and does not support multiple LLM providers.

- **Offering Strategy:** GitHub lists an extensive number of systems integrators as partners, but lags some competitors in defining detailed partner roles and developing joint solutions.

GitLab

GitLab is a Leader in this Magic Quadrant. Its product, GitLab Duo, is focused on providing AI-powered capabilities across the SDLC, including code suggestions, security vulnerability resolution, root cause analysis and fixes for pipeline failures. Its operations are geographically diversified, and its clients tend to be large organizations across various sectors. GitLab is investing in the development of self-hosted models and the expansion of its AI Impact analytics dashboard to provide visibility into ROI.

Strengths

- **Business model:** GitLab has hundreds of FTEs dedicated to GitLab Duo product development and support, who drive continuous innovation and high customer satisfaction. It has a relatively high percentage of partner-driven customer acquisition (18%) and has built strategic partnerships with major cloud providers. GitLab also has no restrictions on performance across offerings and is exploring consumption-based pricing.

- **Sales execution/pricing:** GitLab has acquired more than 20,500 customer organizations, including more than 50% of global enterprises, and 7,000 enterprise customers use its AI code assistant. It offers a transparent and flexible pricing strategy, including tiered options, consistent pricing across various deployment models, and no minimum seat requirement for GitLab Duo add-ons. GitLab also provides a free 60-day trial with full-feature access to allow potential users to thoroughly evaluate the product.

- **Marketing Execution:** GitLab's SEO strategy, content marketing efforts and account-based awareness campaigns ensure high visibility and engagement, further supported by well-funded product marketing and PR. GitLab's active participation in high-profile conferences and summits worldwide enhances its market presence and credibility.

Cautions

- **Market understanding:** GitLab provides few details on advanced AI technologies such as neural compilers and automated reasoning models, unlike other industry leaders. GitLab Duo's customization options are confined to the GitLab platform, potentially leading to vendor lock-in, and Gitlab's customer council program lacks global reach, as it is primarily focused on U.S.-based customers.

- **Market responsiveness/record:** GitLab has less real-time engagement in its customer feedback mechanisms compared to its competitors. It also lacks a marketplace of solutions where customers or partners can actively contribute to the GitLab Duo ecosystem, and it does not participate in as many AI open-source projects as other vendors.

- **Geographic strategy:** GitLab does not yet offer self-hosted models to address data sovereignty and compliance issues, although it plans to add this capability by the end of 2024. GitLab does not offer robust multilanguage capabilities for its user interface and documentation, as it is primarily in English and offers some features in Spanish, German and Japanese. Also, GitLab's customer council program lacks global reach, primarily focusing on U.S.-based customers.

Google Cloud

Google Cloud is a Leader in this Magic Quadrant. Its product, Gemini Code Assist, is focused on providing AI-powered coding assistance to enhance developer productivity, code quality and security across the SDLC. Its operations are geographically diversified, and its clients tend to be large enterprises across various sectors. Google Cloud is investing in features such as full codebase awareness and code customization, while maintaining stringent security and privacy standards. It is developing more integrations with third-party development tools and support for a prompt context window of up to two million tokens.

Strengths

- **Market responsiveness/record:** Google Cloud has an extensive ecosystem of open-source and third-party integrations for Gemini Code Assist, including prominent partners like Elastic, MongoDB and HashiCorp. With 5% of customers and 95% of partners actively contributing to the Google Cloud marketplace, the platform fosters a collaborative environment that drives innovation and customer-centric enhancements. Google Cloud's diverse feedback channels, such as the Customer Advisory Board and in-product feedback widgets, ensure that customer input directly influences product development.

- **Marketing execution:** Google Cloud effectively emphasizes the unique features of its product, including its industry-leading, two-million-token context window and IP indemnification with source citations. Google Cloud's user engagement is a major focus, emphasized by its consistent and ample social media activities, blogs and tutorials.

- **Market understanding:** Gemini Code Assist helps to accelerate developer onboarding, reduce context-switching and enhance code maintainability, thereby improving productivity and code quality. Its strategic focus on enhanced automation and autonomy, advanced contextual and multimodal understanding, and seamless integration across the SDLC aligns with evolving market needs and technology trends.

Cautions

- **Sales execution/pricing:** Gemini Code Assist is priced on a fixed per-user, per-month basis, and unlike some of its competitors, Google does not offer consumption-based pricing. Also, Google Cloud does not offer a free tier for Gemini Code Assist, but does expect to launch the tier later in 2024.

- **Product or service:** Gemini Code Assist has relatively limited IDE support, encompassing Visual Studio Code, Cloud Workstations, Cloud Shell Editor, and JetBrains IDEs, but has comprehensive support for Google-specific developer environments such as Project IDX, Firebase, Colab, and BigQuery. Google focuses on the quality of output produced by Gemini Code Assist for the programming languages it supports, but lists fewer programming languages than its competitors. Gemini Code Assist currently lacks advanced context awareness capabilities, such as context-pinning and multirepository awareness, but plans to introduce support for them later in 2024.

- **Sales strategy:** Google Cloud's discounting strategy is complex and conditional, as it ties significant discounts to committed use of Google products. Google Cloud also lacks detailed plans for various deployment methods. Gemini Code Assist uses various models to synthesize results, but does not allow customers to bring their own models, unlike some competitors who do.

IBM

IBM is a Challenger in this Magic Quadrant. Its product, watsonx Code Assistant, is focused on improving developer productivity with AI-powered code assistance, specifically targeting areas like mainframe application modernization, IT automation with Ansible and the acceleration of the Java application life cycle. Its operations are geographically diversified, and its clients tend to be large enterprises across various sectors. IBM is investing in expanding the capabilities of watsonx Code Assistant, including support for Enterprise Java Applications, which is expected to be available in October 2024, and is also enhancing the customization and security features of its AI models.

Strengths

- **Marketing execution:** IBM effectively markets watsonx Code Assistant's comprehensive feature set, including application discovery, code generation, explanation, code transformation, automated refactoring and unit test generation, highlighting its ability to enhance productivity and code quality. IBM's marketing approach, including targeted paid advertising, paid search campaigns, social media engagement, video advertising and content marketing, along with proven productivity gains from pilot programs, enhance its product visibility and credibility.

- **Sales execution/pricing:** IBM has transparent and flexible pricing models, such as seat-based and consumption-based options. IBM offers free trials, private previews and proof-of-concept (POC) pilots to allow potential users to thoroughly evaluate the product. IBM

also enables users to tailor offerings for specific business needs via fine-tuning and enterprise-context-aware assistance. IBM supports numerous deployment options, including public cloud, private cloud, hybrid and on-premises, to address data security and regulatory compliance concerns while supporting growth.

- **Operations:** IBM provides uptime guarantees from 99.9% to 99.995%, and its support response times are well-defined, with responses as quick as 15 minutes for critical issues. IBM's seamless upgrade policy for cloud services ensures minimal disruption, and on-premises customers have the flexibility to schedule updates. IBM's global support infrastructure includes 24/7 operation centers across multiple regions. IBM's hosting strategy is highly differentiated, offering flexible deployment options across private cloud, public cloud, SaaS and on-premises environments.

Cautions

- **Offering strategy:** Although IBM sees AI agents as a major disruption in code assistance, agents aren't one of the top-five areas, technologies or capabilities that IBM is working on for watsonx Code Assistant. They are a top priority for IBM Research, and they are intended to be included in the future of watsonx Code Assistant. Its investment focus does not appear to emphasize real-time collaboration tools, such as live code reviews and pair-programming features.

- **Product or service:** IBM's AI code assistant has limited terminal integration and advanced context awareness features, and it lags competitors that provide detailed analytics and reporting, IDE integrations, robust instruction commands, and a partnership marketplace. The product's setup process is more complex and time-consuming than other competing offerings, and it only supports customization for specific offerings like watsonx Code Assistant for Ansible, with customization and tuning support planned for watsonx Code Assistant for Z in the future.

- **Vertical/industry strategy:** IBM has not outlined targeted strategies for specific verticals. Its generalized industry-agnostic approach may limit IBM's ability to address the unique needs and challenges of different industry segments effectively.

Refact.ai

Refact.ai is a Niche Player in this Magic Quadrant. Its product, Refact.ai, is open-source software, and is focused on providing customizable, context-aware AI coding assistance across various IDEs and programming languages. Its operations are geographically

diversified, and its clients tend to be medium to large enterprises. Refact.ai envisions an AI teammate, and is investing in enhancing its product with features like automatic error fixing, memory awareness and agent capabilities, while also expanding its fine-tuning capabilities and on-premises deployment options.

Strengths

- **Marketing execution:** Refact.ai has effectively conveyed the benefits of its AI code assistant and created visibility for its offering through Google paid ads, PR on platforms like TechCrunch, and content creation. Despite a limited social media presence, Refact.ai's participation in key conferences such as MWC, Viva Technology and South Summit build its credibility in the industry.

- **Product or service:** While Refact.ai's product scores are not as high as other vendors in this research, it offers compelling features. Refact.ai's AI Toolbox includes a wide range of commands for tasks like bug fixing, code commenting and code generation to enhance coding efficiency and quality. It supports various programming languages, and it leverages both proprietary and third-party models to provide accurate and relevant code suggestions. Its prompt engineering capabilities allow for precise, context-aware assistance.

- **Sales execution/pricing:** Refact.ai has transparent, flexible and competitive pricing with no minimum seat requirements, making it accessible to organizations of all sizes. It also offers a free plan for B2C customers and a two-week trial for B2B customers. Its segmented offerings for B2C and B2B customers, along with a clear progression of features across tiers, provide tailored solutions for diverse user needs. Refact.ai provides both cloud and self-hosting options, supports advanced AI features, and emphasizes privacy and security, particularly in higher tiers. Additionally, Refact.ai is open-source software with a business-friendly BSD 3-clause license, allowing users to customize and build plug-ins to suit their specific requirements.

Cautions

- **Customer experience:** Refact.ai offers minimal training programs and lacks a structured support organization. Additionally, there are no comprehensive customer success programs or clear metrics to measure ROI and customer success effectiveness. While they support a Discord community, the overall customer experience framework is underdeveloped.

- **Vertical/industry strategy:** Refact.ai lags its competitors in vertical and industry strategies, with no industry-specific partners or initiatives to increase market share in different segments yet. However, they are exploring options in the biotech and finance industries.

- **Market responsiveness/record:** Refact.ai has relatively limited involvement in open-source projects and lacks customer and partner contributions to its marketplace, indicating a low level of community engagement. Refact.ai lacks the diverse customer feedback mechanisms of industry leaders, such as advisory boards, community forums and advanced analytics, which are essential for driving responsive product development.

Sourcegraph

Sourcegraph is a Visionary in this Magic Quadrant. Its product, Cody, is focused on providing AI-powered code assistance to help developers understand, write and fix code more efficiently. Its operations are geographically diversified, and its clients tend to be large enterprises. Sourcegraph is investing in enhancing model fine-tuning, expanding language support and developing autonomous coding capabilities, as it aims to integrate comprehensive context from various tools and support flexible deployment methods.

Strengths

- **Business model:** Sourcegraph is expanding its market reach through strategic product introductions like Cody Pro, which is tailored for individual developers and small teams, and through effective use of partnerships, which account for 14% of new customer acquisitions. It has a balanced and healthy allocation of FTEs across critical functions like product development and runtime operations. Its innovative feature-testing approach ensures that it continuously improves its offerings.

- **Product or service:** Sourcegraph Cody integrates with popular IDEs, leverages leading LLMs and offers advanced contextual understanding and strong security measures. Its flexible deployment options, customizability, comprehensive analytics and extensive language support make it a powerful tool. Cody's robust instruction commands enhance usability and developer productivity, aligning well with enterprise needs.

- **Offering strategy:** Sourcegraph's focus on enhancing AI response quality, integrating universal context, expanding support across development environments and developing autonomous coding capabilities ensures that its product serves diverse user needs. Sourcegraph continuously improves its product with rapid iteration cycles, community

engagement (such as its Early Access Program), rich user telemetry, a transparent product roadmap, and strategic partnerships with Leidos, Nomura Research Institute (NRI) and IG Group.

Cautions

- **Vertical/industry strategy:** Sourcegraph has customers across a broad spectrum of industries, but fewer industry-specific partnerships than some of its competitors. Sourcegraph's approach of cross-selling and upselling to existing customers does not address the need for targeted strategies that cater to distinct industry needs.

- **Market understanding:** Sourcegraph focuses on enhancing specific developer tasks without extending automation across the entire SDLC. Sourcegraph has advanced autonomous capabilities for complex problem solving on its roadmap, but they are not generally available yet. It has an Early Access Program and quarterly business reviews with enterprise customers, but no formal customer council program yet. Also, Sourcegraph focuses on code search and navigation without addressing broader market needs, such as security and compliance and cross-disciplinary collaboration.

- **Operations:** Sourcegraph's onboarding process for self-hosted customers can take anywhere from a few days up to six weeks, which is more variable than its competitors. Sourcegraph also lacks regional variation in technical support, which could limit its effectiveness in addressing region-specific issues.

Tabnine

Tabnine is a Niche Player in this Magic Quadrant. Its product, Tabnine, is focused on providing personalized, secure and compliant code completion and chat capabilities. Its operations are geographically diversified, and its clients are of all sizes across various sectors. Tabnine is investing in enhancing its product portfolio with features such as advanced retrieval-augmented generation (RAG) for context and customization, expanded integration with tools like Jira, image input, and improved AI agents for code review and test generation. It is also focused on maintaining its competitive edge in privacy and deployment flexibility.

Strengths

- **Sales execution/pricing:** Tabnine offers a transparent and flexible pricing model that includes a free Basic tier, a competitively priced Pro tier and a comprehensive Enterprise

tier. Tabnine's consistent pricing across public, private, hybrid cloud and on-premises options eliminates financial barriers and simplifies decision making. It also offers automatic 30-day Pro trials and extended 90-day trials for information-sharing users.

- **Offering strategy:** Tabnine uses data-driven methodologies and diverse feedback channels to continuously refine its product, which is used by more than 1.5 million developers and thousands of paid subscribers. It is investing in advanced AI capabilities, such as refining LLMs for more accurate, context-aware code completions, and provisioning private deployments, on-device models and custom models. Tabnine's extensive network of global and regional partners, including Accenture and Cognizant, provides robust implementation support.

- **Overall viability:** Tabnine has strong financial backing from top-tier venture firms, an efficient growth model and robust financial processes, positioning it to navigate economic downturns. It demonstrates strong customer loyalty, with a perfect customer retention rate and a 100% annual contract value retention rate. Its dedicated team of well-resourced full-time employees focuses on continuous innovation.

Cautions

- **Market responsiveness/record:** Tabnine lags competitors in integrating its AI code assistants with other agents, and in using community engagement platforms such as dedicated forums, Slack channels and social media. Also, Tabnine's responsiveness and customer engagement could be deeper, as it lacks live chat support.

- **Business model:** Tabnine has limited product diversity and lacks innovative pricing models. Relative to its competitors, Tabnine has a smaller headcount to support enterprise customers than some competitors, with plans to expand with demand. Tabnine reports that a healthy percentage of new customers are obtained via partners, but is moderate compared to other vendors that have a higher reliance on partnerships for customer acquisition.

- **Vertical/industry strategy:** Tabnine is focused on technology integration rather than comprehensive, industry-specific strategies. Tabnine does not have any specific initiatives tailored to individual verticals. Its model trainer allows customers to generate specific models tailored to its business needs, but it does not compensate for the lack of targeted, industry-specific initiatives.

Tencent Cloud

Tencent Cloud is a Niche Player in this Magic Quadrant. Its product, Tencent Cloud AI Code Assistant, is focused on enhancing developer productivity through intelligent code predictions and context-aware suggestions, integrating with popular IDEs, as well as Tencent Cloud Studio and Xcode. Its operations are geographically diversified, and its clients tend to be of all sizes across various sectors. Tencent is investing in research and development for areas such as LLMs and RAG.

Strengths

- **Offering strategy:** Tencent is investing heavily in hybrid and multicloud solutions, as well as security and compliance features for its AI code assistant. Tencent's diverse feedback collection methods, including customer surveys and advisory boards, and its support for consulting and systems integrator partners ensure continuous product improvement and strong market reach. Its regular product updates and continuous investment in R&D keep its offerings competitive.

- **Sales strategy:** Tencent responds to market demands with continuous product innovation and strategic partnerships. Its transparent and flexible discount policy includes a clear, tiered structure for multiyear contracts and incentivizes long-term commitments. Meanwhile, its global sales reach, extensive customer support and training programs, seamless ecosystem integration, proven track record, and data-driven insights further enhance its appeal.

- **Marketing strategy:** Tencent targets a broad range of technical individual contributor and leadership roles, employing a multifaceted approach to engage CTOs, CIOs and software engineering leaders. It uses strategic partnerships and direct outreach, including content marketing, influencer collaborations, and active participation in major conferences and events, to enhance visibility and market penetration. Tencent's phased rollouts and beta testing, educational and training partnerships, and product marketing also help it to gain developer mind share.

Cautions

- **Vertical/industry strategy:** Tencent provided no specific details on industry-specific, go-to-market or technology partnerships, which either indicates a lack of strategic focus or transparency in its vertical/industry strategy.

- **Innovation:** Tencent has an opportunity to further differentiate itself by enhancing its techniques. It leverages industry-standard techniques and practices, such as user-centric design and agile development. It is developing some promising innovations, including a multimodal expert model, improved customization capabilities through RAG and supervised fine-tuning, but these developments are mostly catching up with leading competitors.

- **Market responsiveness/record**: Tencent could improve the number of feedback channels it uses to engage customers across different regions and platforms, aligning with industry-leading practices. Tencent's responsiveness could be more proactive, where feedback leads to instant product tweaks or direct developer engagement. Tencent's ability to implement customer feedback into product development is limited compared to leading competitors.

Inclusion and Exclusion Criteria

To qualify for inclusion in this Magic Quadrant, providers need to:

- Offer a product that includes all the mandatory features listed in the Market Definition and is generally available by 30 September 2024.

- Have at least 10 paying customer organizations.

Gartner defines general availability (GA) as the release of a product to all customers. When a product reaches GA, it becomes available through the company's general sales channel — as opposed to a limited release, or beta version, used primarily for testing and user feedback purposes.

Evaluation Criteria

Ability to Execute

Product/service: This criterion assesses the core goods and services that compete in or serve the defined market, including current product and service capabilities, quality, feature sets and skills, whether offered natively or through OEM agreements/partnerships. It seeks to understand the vendor's integration capabilities, adaptability to various programming

languages, frameworks, and IDEs, and the extent of customization and flexibility offered to users. Additionally, it evaluates the performance and effectiveness of the AI model and its automation, tracking, and analysis capabilities, as well as the vendor's commitment to security and compliance, including IP management and data protection. Lastly, it explores the vendor's marketplace offerings, partnerships, and ability to provide integrated solutions with other enterprise applications, along with their vision for the future of AI code assistants and commitment to providing valuable metrics to customers.

Overall viability: This criterion assesses the viability of the organization, including its overall financial health, the financial and practical success of the business unit, and the likelihood of continued investment in the product. It seeks comprehensive information about the vendor's financial status, including venture capital funding, profitability, strategies for economic downturn, investment plans for the next 12 months, annual revenue for fiscal year 2023 and projected revenue for fiscal year 2024. Additionally, it evaluates customer and market engagement, focusing on customer retention rates for calendar year 2023, the largest installation by number of concurrent users, and any relevant business acquisitions in the last 12 months. Lastly, it examines the organizational structure and workforce, including the number of full-time employees dedicated to the product, and any changes in senior management over the past year.

Sales execution/pricing: This criterion assesses the organization's capabilities in all presales activities and the supporting structure, including deal management, pricing and negotiation, presales support, and the overall effectiveness of the sales channel. It seeks detailed insights into the customer base, such as the top five decision makers in large enterprises who use the product, the current number of customers, segmentation across different sectors, and the longevity of relationships with large enterprise customers. Additionally, it evaluates the pricing models, including variations for different deployment methods like public cloud, private cloud, virtual private cloud and on-premises, as well as the minimum number of seats required for different editions. Lastly, it examines any free or trial offerings associated with the product, providing an understanding of the customer acquisition strategy and how potential customers can evaluate the product before making a purchase decision.

Market responsiveness and track record: This criterion assesses the organization's ability to respond, change direction, be flexible, and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change, including the provider's history of responsiveness to changing market demands. It seeks detailed information about the company's active engagement in open-source communities, the

percentage of customers and partners contributing to the marketplace, and the year-over-year growth of the partner marketplace. Additionally, it evaluates the mechanisms used to listen and respond to customer needs, providing specific examples of their effective employment. Lastly, it examines the extent of product customization for different markets and the company's ability to innovate by being early-to-market with platform capabilities that competitors are only now catching up to.

Marketing execution: This criterion assesses the clarity, quality, creativity and efficacy of programs designed to deliver the organization's message to influence the market, promote the brand, increase product awareness, and establish a positive identification in the minds of customers. It seeks a clear description of how the product is positioned to development teams, the top reasons for developers to use the product, and the key differentiators that set it apart in the market. Additionally, it evaluates the estimated marketing budget for 2024, major marketing initiatives undertaken in the past year, strategies for visibility on search engines and live TV, and engagement with followers/subscribers on various online and social media channels. Lastly, it examines the physical conferences sponsored or presented at in 2023, identifies top competitors, and highlights the unique differentiators that set the organization apart from these competitors.

Customer experience: This criterion assesses the products, services and programs that enable customers to achieve anticipated results, including quality interactions, technical support and account support. It seeks details on training programs for developers, onboarding timelines, success measurement, implementation resources and user training needs. Additionally, it evaluates the customer support structure, FTEs dedicated to support, support availability, SLAs, response times, recent outages and partner involvement, including a customer portal URL. Lastly, it examines the organization's customer success program, retention strategies, user community support, ROI measurement, and the metrics and benchmarks used to gauge the effectiveness of the customer success program.

Operations: This criterion assesses the organization's ability to meet goals and commitments, focusing on the quality of its structure, skills, experiences, programs and systems. It seeks detailed information about SLAs, including system uptime, upgrade policies, release timing and the growth rate of FTEs devoted to enterprise technical support, as well as subscriber options for update timing. Additionally, it evaluates staff training on risk management, workforce reductions, operation and support centers worldwide, the maximum number of concurrent users supported, onboarding speed, and formal

communication processes with customers. Lastly, it examines environmental sustainability initiatives implemented in the past 12 months, the differentiation of hosting strategies, and the certifications included with the product offering.

Ability to Execute Evaluation Criteria

Evaluation Criteria	Weighting
Product or Service	High
Overall Viability	High
Sales Execution/Pricing	High
Market Responsiveness/Record	High
Marketing Execution	Medium
Customer Experience	High
Operations	High

Source: Gartner (August 2024)

Completeness of Vision

Market understanding: This criterion assesses the ability of vendors to understand and translate customer needs into innovative products and services, particularly within the realm of software engineering. It focuses on product development, identification of key offerings, and adaptation to evolving client requirements for enhanced product viability. Additionally, it evaluates the proficiency of vendors in monitoring market trends, navigating challenges in the AI code assistants market, and anticipating technological disruptions to formulate a forward-thinking strategic vision. Lastly, it considers the commitment to corporate

responsibility, including plans for carbon neutrality and active customer engagement through initiatives like a customer council program.

Marketing strategy: This criterion assesses the organization's ability to deliver clear, differentiated messaging that is consistently communicated internally and externalized through social media, advertising, customer programs and positioning statements. It focuses on how well the organization defines its offering messaging, positioning and go-to-market strategy, and how skillfully it plans its top marketing initiatives for industry understanding and adoption. It also measures how well the organization has identified its target market verticals and client sizes. Additionally, it evaluates the organization's targeting of specific roles for product marketing, outreach to CTOs, CIOs, and software engineering leaders, and differentiation of the product value proposition by persona/buyer. Lastly, it considers the identification and targeting of new partners for 2024, as well as the recognition received by the company in the form of diversity, equity and inclusion (DEI) awards in the last 12 months.

Sales strategy: This criterion assesses the organization's ability to implement a sound sales strategy using appropriate networks, including direct and indirect sales, marketing, service, and communication. It focuses on the organization's understanding of its sales growth strategies for 2024, as well as factors shaping the sales pipeline, projected growth of the sales team, planned initiatives for product adoption, and the impact of market changes on sales strategy. Additionally, it evaluates potential market expansion in the next 12 months, identifying target countries/regions and industries, and the contribution of indirect sales channel partners to revenue. Lastly, it considers detailed information on pricing strategy, including licensing models, SaaS and on-premises costs, discount offerings, and the organization's approach to consumption-based charging.

Offering (product) strategy: This criterion assesses an approach to product development and delivery that emphasizes market differentiation, functionality, methodology and features aligned with current and future requirements. It focuses on understanding the AI code assistant offering, including its name, technical architecture, professional services, and trained consulting and systems integrator partners. Additionally, it evaluates the user base, detailing the number of developers using free and paid versions, and outlines the vendor's strategy for supporting and contributing to open-source software usage and development. Lastly, it considers the vendor's strategic approach to product development and market positioning, including investment areas, success metrics, methods to avoid

commoditization, product enhancement strategies, and processes for integrating customer feedback into the product roadmap.

Business model: This criterion assesses the design, logic and execution of the organization's business proposition to achieve continued success. It delves into the vendor's business model changes concerning the AI code assistant offering, the model's planned evolution over the next 12 months, and the offering's contribution to overall company revenue. Additionally, it evaluates the vendor's partnership strategy, focusing on the percentage of new customers obtained via partners or partner references in the last 12 months. Lastly, it examines the vendor's staffing structure for supporting the offering and any potential limitations imposed by different offering editions on the AI code assistant's performance, such as rate limits and the number of conversations during a specific time period.

Vertical/industry strategy: This criterion assesses the organization's strategy for directing resources, skills and products to meet the specific needs of individual market segments, including verticals. It seeks a comprehensive understanding of industry-specific go-to-market or technology partnerships, providing insight into strategic alliances and potential synergistic benefits. Additionally, it requires a detailed overview of customer distribution across various verticals, including key customer names and top industry verticals with prebuilt models, components or assets, to gauge market presence and industry focus. Lastly, it evaluates major initiatives planned to increase market share in vertical industry segments over the next 12 months, assessing forward-thinking strategies, growth potential and commitment to innovation.

Innovation: This criterion assesses the direct, related, complementary and synergistic allocation of resources, expertise or capital for investment, consolidation, defensive or preemptive purposes. It seeks comprehensive insights into the vendor's innovation strategy, including processes and methodologies, future innovation plans, top differentiating innovations, the proportion of revenue invested in R&D, and strategic partnerships for innovation. Additionally, it requires detailed information on how the vendor differentiates itself in the market with innovative product features and strategic partnerships, providing a clear picture of their competitive edge. Lastly, it evaluates the vendor's commitment to the broader technology community through contributions to open source or open standards related to its product.

Geographic strategy: This criterion assesses the provider's strategy to direct resources, skills, and offerings to meet the specific needs of geographies outside its native region,

either directly or through partners, channels and subsidiaries. It requires a comprehensive overview of the vendor's differentiated delivery, sales and marketing strategies for various geographies, as well as its top three initiatives aimed at expanding market share beyond its core region. Additionally, it evaluates how the vendor ensures compliance with data sovereignty requirements, the internationalization/localization capabilities of their offering, and the number of natural languages supported. Lastly, it considers the vendor's current and prospective geographic markets, detailing its physical presence, staff count, customers, channel partners and the number of new customers acquired in each region over the past year.

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Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	High
Marketing Strategy	Medium
Sales Strategy	Medium
Offering (Product) Strategy	High
Business Model	High
Vertical/Industry Strategy	Medium
Innovation	High
Geographic Strategy	High

Source: Gartner (August 2024)

Quadrant Descriptions

Leaders

Leaders in the Magic Quadrant for AI Code Assistants excel in delivering comprehensive AI-powered capabilities that are most likely to improve developer productivity, code quality and security across the SDLC. They demonstrate a deep understanding of market needs and continuously innovate by integrating advanced AI models and expanding their feature sets to stay ahead of industry trends. These vendors also excel in building robust ecosystems through seamless integration with third-party development tools, and maintaining strong security and compliance measures to protect against vulnerabilities and intellectual property risks. Additionally, their geographically diversified operations enable them to serve a wide range of clients across various sectors, ensuring broad accessibility and support.

Challengers

Challengers in the Magic Quadrant for AI Code Assistants excel in execution through robust sales execution and pricing, effective product offerings and operational efficiencies that drive user adoption and commercial success. They leverage aggressive market branding, strategic partnerships and extensive sales networks to boost product sales efficiency. However, these vendors lack a comprehensive vision, as evidenced by limited product roadmaps, insufficient focus on real-time collaboration tools and a narrow understanding of market challenges. While they deliver reliable and effective solutions, their strategic focus and market foresight are not as well-developed, limiting their ability to anticipate and address future market needs comprehensively.

Visionaries

Visionaries in the Magic Quadrant for AI Code Assistants excel in their forward-thinking vision, pioneering innovative features like advanced AI-driven code suggestions and seamless tool integrations. They have a deep understanding of market needs, focusing on enhancing developer productivity, code quality, and addressing emerging challenges such as security vulnerabilities and compliance. However, these vendors show weaknesses in execution, such as limited operational efficiency and weaker sales networks. While their strategic foresight is strong, their ability to execute lags behind, preventing them from achieving the same market impact as the Leaders.

Niche Players

Niche Players in the Magic Quadrant for AI Code Assistants typically offer specialized solutions that cater to specific segments or unique use cases in the market. In some cases, these offerings can align well with an organization's use cases and may be the best fit for the organization's developers. However, these vendors tend to lag in both execution and vision, exhibiting limited operational efficiency, weaker sales and marketing strategies, and a narrower focus that fails to address the broader needs of the market. Their overall impact and market reach are constrained, compared to more versatile and forward-thinking competitors.

Context

Selecting an AI code assistant for your organization should be a collaborative effort. Organizations investing in AI privacy tools see impactful business outcomes. In the 2023 Gartner AI in the Enterprise Survey, more than 70% of respondents said they consider their investment in AI privacy, security and risk to be impactful for regulatory compliance, revenue growth and cost optimization. [1] IT leaders should, therefore, establish a cross-functional task force of engineering, architecture, security and legal experts. The task force should use the analysis in this Magic Quadrant to create a shortlist of AI code assistant vendors.

Based on this shortlist, the task force should pilot AI code assistants in the organization. The goal should be to establish POCs, gauge possible use cases and select vendors to use in the short term (as vendors are rapidly evolving their offerings and adding new features).

When piloting AI code assistants, the task force should:

- **Set baseline key metrics before using AI code assistants.** Use common developer productivity and experience frameworks, such as DevOps Research and Assessment (DORA) metrics and the SPACE framework, which accounts for satisfaction and well-being, performance, activity, communication and collaboration, and efficiency and flow (see How to Measure and Improve Developer Productivity).

- **Evaluate the impact of AI code assistants using both quantitative metrics and qualitative survey data.** Assess risks such as generated security vulnerabilities and copyrighted code and documentation, and monitor the generated output for bias, explicit material and

other ethical challenges. Avoid relying on any single category of metrics by using a combination of activity-based output metrics and value-based impact metrics. Developer surveys are a common method to assess the impact. Software engineering intelligence platforms can also help measure the impact of AI code assistants (see **Market Guide for Software Engineering Intelligence Platforms**).

- **Select top-performing tools based on POC results and user feedback.** Expand the pilot across an increasingly diverse user base over the next several weeks to validate the impact and efficacy of risk mitigation measures. Establish mechanisms to allow users to learn from each other. A simple internal chat can evolve into a community of practice and allow mentors to develop and disseminate best practices. Refine and iterate the pilot quarterly to address key pain points, expand to new use cases and scale successes (see **How to Pilot Generative AI**).

Market Overview

AI code assistants have captured the attention of developers across the globe and are one of the most hyped technologies in the history of software development.

While organizations were initially hesitant to adopt AI coding assistants due to the risks, most large enterprises accelerated their adoption of this technology due to the benefits for developers. According to the 2023 Gartner Technology Adoption Roadmap for Large Enterprises Survey, software engineering leaders indicated that their organizations were piloting AI code assistants. [2]

We expect that adoption of AI code assistants will continue to rapidly increase, as more organizations seek to boost software developers' efficiency, minimize cognitive load, amplify problem solving, accelerate the pace of learning, foster creativity and maintain their state of flow.

In response to high customer demand, dozens of vendors have rushed to create their own commercial AI code assistants. As AI code assistants begin to reach mainstream adoption, vendors are rapidly expanding and improving the capabilities of their offerings.

AI code assistants can now support developers in a wide range of use cases, including:

- **Code generation:** Developers use the code editors in AI code assistants to autocomplete code and generate features, which helps them to complete programming tasks faster.

- **Code debugging:** Developers use AI code assistants to detect and fix bugs in code, which helps them to resolve errors without the need to ask peers or search the internet for solutions.

- **Code modernization:** Developers use AI code assistants to understand complex dependencies across many programs, which helps them to reduce technical debt and modernize code.

- **Artifact building and testing:** Developers use AI code assistants to generate acceptance tests from user stories (for example, in Gherkin format) and to generate unit tests.

- **Code explanation:** Developers use AI code assistants to get natural-language explanations for code, which helps them understand complex and unfamiliar code.

However, the capabilities and overall performance of AI code assistant vendors varies widely. For example, only a handful of vendors are focusing on domain-specific models.

To navigate this variability, software engineering leaders and other IT leaders should use this Magic Quadrant to compare 12 vendors in the AI code assistants market. This analysis will help leaders cut through the noise in this highly hyped market, so they can select vendors that align with their organization's AI ambitions and developer's use cases.

In response to growing client demand for a more thorough evaluation of this market, we have created this Magic Quadrant for AI Code Assistants to replace the Innovation Insight for AI Code Assistants.

Acronym Key and Glossary Terms

Automated reasoning models	Automated reasoning models focus on using logic and mathematical techniques to automate various forms of reasoning and problem-solving, such as theorem proving and model checking.
Neural compilers	Neural or neuron compilers are specialized tools designed to optimize deep learning models so they can more efficiently on a specific model inference architecture.

Retrieval-augmented generation (RAG)	Introduced in a 2020 research paper by Meta, the pattern has become foundational in GenAI application architectures, comprising content stores, a search and retrieval mechanism, and a large language model (LLM). The process involves rewriting the user's prompt into a query, retrieving relevant content, and generating a response using the LLM.
Supervised fine-tuning (SFT)	Supervised fine-tuning is the process of refining a pretrained machine learning model using labeled datasets to improve its performance on specific tasks.

⊕ Evidence

⊕ Evaluation Criteria Definitions