The AI Assistant Revolution: Microsoft Copilot And The Future Of Programming

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ARTICLE INFO	ABSTRACT
	Microsoft Copilot is an innovative code completion tool powered by artificial intelligence (AI) developed by OpenAI in collaboration with GitHub. This paper aims to explore the architecture, functionality, implications, and potential applications of Microsoft Copilot in the field of software development. By delving into its underlying technology, capabilities, and controversies, this paper provides insights into the impact of AI-driven code generation tools on developers, industry practices, and the future of software development. **Keywords:** Microsoft Copilot, Artificial Intelligence, Microsoft 365, Automation

Introduction

In recent years, the field of AI has witnessed remarkable advancements, particularly in natural language processing (NLP) and machine learning. These advancements have led to the development of various AI-driven tools designed to assist and augment human activities across different domains [1]. Microsoft Copilot is a generative AI service offered by Microsoft which acts as "your everyday AI companion."

It is an AI powered assistant that helps users with their daily tasks in Microsoft 365. It can help users with tasks such as summarizing key documents, catching up on communications, generating email drafts, search for answers to key questions etc. [2] [3]

Copilot is a conversational chat interface which lets users search for any particular information, generate text like emails, summary notes, and create images based on user written text prompts. For example, if any user types in, "Create minutes of the meeting and action items," Copilot will do that by giving you a meeting notes within the chat interface below user request. Similarly, for images when a user describes what he or she wants it to draw using text. Users can even ask Copilot to write code in a variety if coding languages, including C, C#, Java Script and Python. It helps you to get answers to your queries faster. [4]

It helps to work smarter, be more productive, boost creativity, and stay connected to the people and things in your life with Copilot—an AI companion that works everywhere you do and intelligently adapts to your needs. [5] [6]

M365 versions/ editions
Personal
- Jump-start your documents - Bring your ideas to life—use Copilot to quickly create drafts on any topic in Word.
- Catch up in a flash - Transform long email conversations into short summaries with Copilot in Outlook for Windows.
- Create powerful stories - Land your idea clearly and beautifully with Copilot and produce fine-tuned presentations fast.

Business
- Prioritize and stay focussed – Rapidly upgrade in less time with cross-application intelligence with seamless access to your data.
- Deliver excellent customer satisfaction - Get useful coaching tips to create affecting customer communications.
- Enhance customer base – Write, modify, and recapitulate proposals and project plans with Copilot.
- Think faster - Evaluate and research data to create assets such as impactful, specialized visualizations and project dashboards.
- Security control - Ensures same level of security, compliance, and privacy policies that any user has set up in M365.

Enterprise
- Ease digital overload - Scan your complete data universe, such as documents, chats, emails, and the web.
- More efficient meetings – helps you quickly catch up on the missed meetings and enables you to focus completely on the ones you attend.
- Summarize and draft emails – helps drafting email response and summarize lengthy emails.
- Data Analysis and exploration – helps in trend identification, creating insightful dashboards and visuals, and suggest recommendations to drive different outcomes.
- Extensive protection – Offers enterprise level security, privacy, identity, compliance and responsible Artificial Intelligence.
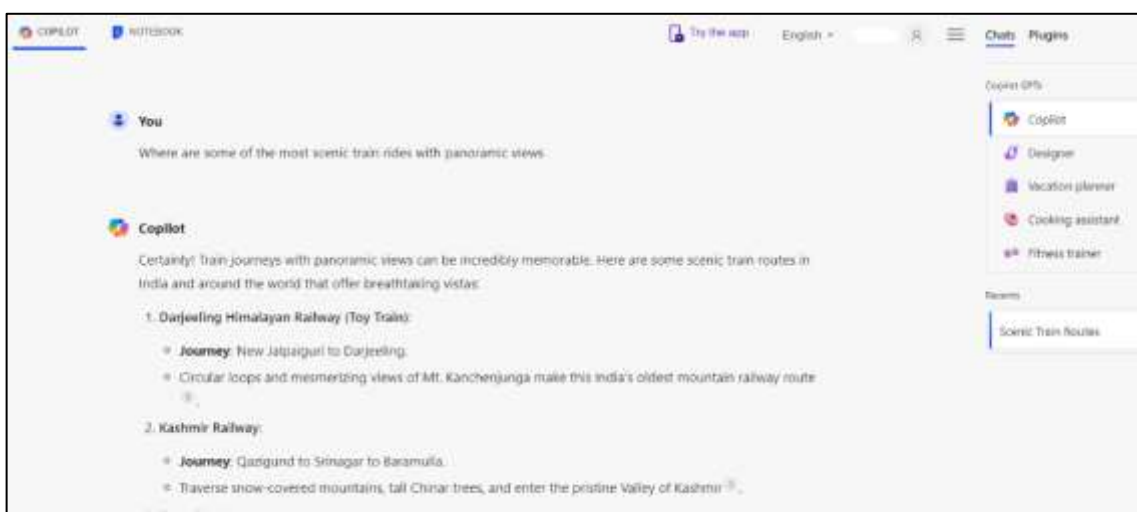
Plans [7]
Below table lists the available plans.

License	User / month	Customers
Microsoft Copilot Pro	₹ 2,000.00	M365 Personal / Family subscribers
Copilot for Microsoft 365	₹ 2,495.00	M365 for business
Copilot for Microsoft 365	₹ 2,495.00	M365 for enterprise and frontline workers

Languages supported in prompt –
1. Arabic
2. Chinese (Simplified)
3. Czech
4. Danish
5. Dutch
6. English (United Kingdom)
7. English (United States)
8. Finnish
9. French (Canada)
10. French (France)
11. German
12. Hebrew
13. Hungarian
14. Italian
15. Japanese
16. Korean
17. Norwegian (Bokmål)
18. Polish
19. Portuguese (Brazil)
20. Portuguese (Portugal)
21. Russian
22. Spanish
23. Spanish (Mexico)
24. Swedish
25. Thai
26. Turkish
27. Ukrainian

Below are the sample screenshots of Microsoft Copilot to apprise you how Copilot displays output to the questions being put to it.
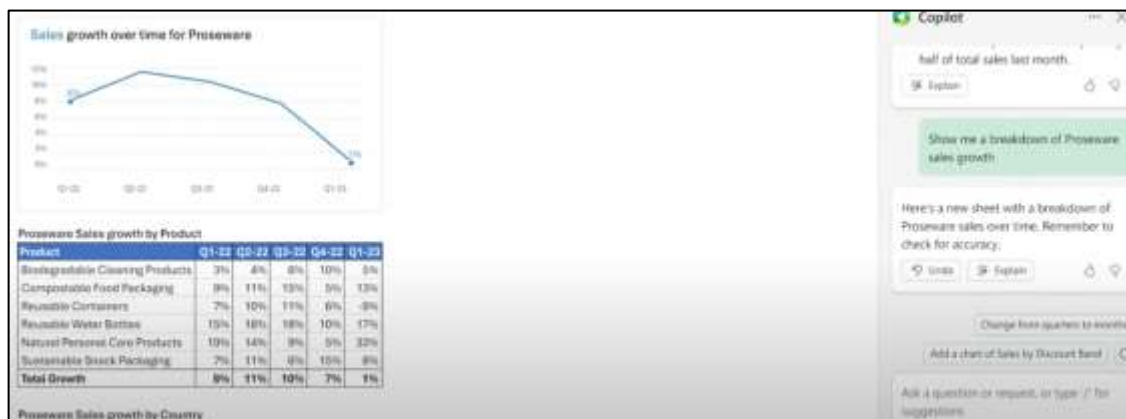
MS Word features

- **Generate content**: copilot assists you generate content based on a prompt you provide. You can also reference up to three of your existing files as inputs to the ground the content copilot drafts.
- **Rewrite text**: Copilot assists you rewrite existing text in your document. You can highlight the text you want to rewrite, and copilot will provide suggestions for ways to rewrite your content.
- **Summarize**: Copilot assists you summarize existing documents into easily consumable points.
- **Transform text**: Copilot assists you transform text into tables.

MS Excel features
- **Copilot in Excel helps analyse and explore your data**- It can reveal correlations, propose what-if scenarios and suggest new formulas based on your questions, generating models that will help you explore your data without modifying it.
- **Natural Language Queries**-You can ask questions about your data in natural language and Copilot will help you identify trends, create visualizations, or ask for recommendations to drive different oputcomes.
- **Data Insights-** Copilot assists you uncover insights from your data by suggesting formulas, charts and graphs
- **Prerequisites-** To use copilot in excel, your file must be stored on OneDrive or Sharepoint online, AutoSave must be enabled, and your data range must be in the table format.

MS Power Point features
- **Generate Content-** Copilot assists you generate a draft slideshow with information from another file.
- **Summarize-** Copilot assists you summarize presentation
- **Change Layout-** Copilot assists you change the layout of a specific slide.
- **Reduce Text-** Copilot assists you reduce text and synchronize it with animations already present in a presentation.
- **Transform text-** Copilot assists you convert written document into comprehensive slide decks, including speaker notes and references.
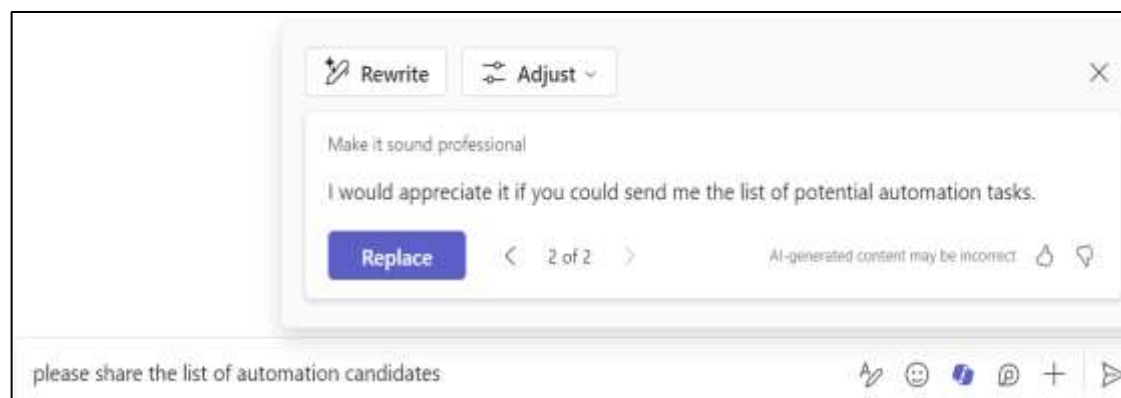
MS Outlook features

- **Draft with co-pilot**- Copilot assists you draft an email by providing suggestions based on the text you provide.
- **Summarizes an email-** Copilot assists you summarize an email by selecting the email and choosing the summarize option.
- **Coaching by co-pilot-** Copilot assists you write better email by focussing on tone, reader sentiment and clarity. It uses AI technology to suggest improvement to your draft, making it easier for you to communicate with your audience.

MS Teams features

- **Facilitate productive discussions**- Copilot in Teams helps facilitate more productive discussions by assisting in identified areas where the team has reached a consensus, presenting alternative options to consider and pinpointing areas of disagreement.
- **Contextual prompt-**: Copilot in teams can provide contextual prompts that provide guidance and enable you to drive the conversation forward.
- **Generate a summary**- Copilot in teams can generate a summary highlighting key discussion points and outlining agreed upon next steps, including specific action items.
- **Intelligent Recap**- Copilot in teams and teams premium are better together with intelligent recap in teams premium you can get an automated summarization and easy navigation of a recorded meeting.
- **Deeper Insights-** With Copilot in teams, you can get more done and gain deeper insights into your teams chats and meeting by opening the Copilot sidecar and asking specific queries/ clarifications and requests. [8]

CONCLUSION

In conclusion, Microsoft Copilot emerges as a transformative tool in the field of software development, heralding a new era of AI-driven assistance for developers. Through its integration of state-of-the-art AI models, Copilot offers intelligent code suggestions and completions that can significantly enhance developer productivity and efficiency. However, its introduction also raises important considerations and challenges that must be addressed to ensure its responsible and effective use. [9] [10]

Firstly, Copilot's ability to generate code based on patterns learned from publicly available repositories raises questions surrounding code ownership, intellectual property rights, and licensing issues. Developers must exercise caution and adhere to ethical standards when utilizing Copilot to avoid potential legal implications.

Secondly, concerns regarding code quality, security vulnerabilities, and the potential for biases in generated code highlight the importance of thorough testing and validation when incorporating Copilot-generated code into production systems. Developers should remain vigilant and supplement Copilot's suggestions with manual review and testing to mitigate risks effectively.

Despite these challenges, Copilot presents numerous opportunities and potential applications in software development. By automating repetitive coding tasks and providing intelligent suggestions, Copilot can streamline the software development lifecycle, accelerate time-to-market, and empower developers to focus on higher-level problem-solving tasks.

Moreover, Copilot has the potential to serve as a valuable educational tool, providing novice programmers with interactive guidance and feedback to learn best practices and coding conventions effectively. Additionally, Copilot's ability to assist developers in navigating complex codebases and exploring unfamiliar domains can foster collaboration and knowledge sharing within development teams.

In essence, while Microsoft Copilot represents a significant advancement in AI-driven code completion technology, its ultimate success and impact will depend on how developers, researchers, and policymakers navigate the ethical, legal, and technical challenges it presents. By fostering collaboration, transparency, and responsible use, Copilot has the potential to reinvent and recast the way software is developed, ultimately leading to more efficient, innovative, and equitable software development practices.

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