As companies execute their plans to refresh an aging PC installed base, IT decision-makers must consider not only the dramatic changes brought about by the shift to more hybrid work but also the positive impact of potent new on-device AI capabilities.

# Considering the Benefits of NPU-Equipped Silicon and Artificial Intelligence Workloads as You Plan Your Next PC Refresh

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## The Importance of the PC

Technology has rapidly evolved since many organizations rushed to outfit their employees with new PCs in 2020 and 2021. As companies plan their next large-scale refresh, companies must consider the changing landscape of collaboration, productivity, and — of course — the looming impact of both artificial intelligence (AI) and generative AI (GenAI) on the PC workloads of today and tomorrow.

## Addressing an Aging PC Installed Base

IDC data shows that PC volumes in 2020 and 2021 grew to new heights, with an impressive combined two-year total of 355.9 million commercial units shipped as companies rushed to outfit a suddenly largely remote workforce. However, many of these PCs were designed for pre-COVID-19 pandemic environments where most employees came into an office. Some of the key issues with these aging PCs are:

» **Poor integrated cameras, microphones, and speakers:** As employees continue to spend a large percentage of their days collaborating with colleagues in far-flung locations and dialing into video calls, subpar hardware can negatively impact communication and harm productivity. New PCs offer higher-resolution cameras, directional microphones, and substantially better sounding speakers.

» **Lack of next-generation networking support:** Wi-Fi standards have evolved over the past four years, dramatically improving throughput and quality of service. Employees stuck on old standards experience more networking interruptions and less job satisfaction. New PCs offer better connectivity and uptime.

» **Aging hardware security and manageability features:** Old hardware doesn't just make life harder for your workers, but it makes it harder for the IT staff to keep these PCs fully managed and secure. New PCs have the latest silicon security and management features built right in.

» **Having to settle for consumer-grade hardware during the rush to acquire PCs early in the pandemic:** These PCs lack enterprise-grade features, and for most IT organizations, it's a key imperative to get them out of the installed base and replace them with commercial-class PCs.

Today, as more companies embrace a hybrid work environment with some days in the office and some days at home, it's increasingly important to address these deficiencies when choosing your company's next major PC deployment.

## *The Rise of AI and GenAI*

Beyond the evolution of collaboration, the biggest looming change to how we use PCs is the arrival of systems with new silicon capable of more efficiently running both AI and GenAI workloads locally versus using PC's CPU, GPU, or a combination of both. Early IDC survey data shows that many information technology decision-makers (ITDMs) are ready and willing to embrace new PCs that include a new piece of silicon architecture called the neural processing unit (NPU). The NPU is built specifically to run AI workloads more efficiently than the system's CPU or GPU, making it possible to move more of these workloads from the cloud — where most GenAI takes place today — to the client, creating a more hybrid environment. This is occurring across a wide range of apps, with AI driving increased operation efficiency, improved security, and more streamlined workflows. In addition, GenAI is rapidly becoming an integral part of many content creation apps as independent software vendors (ISVs) rush to add capabilities that will serve users across many industries and workloads.

This influx of AI and GenAI capabilities has already caught the attention of ITDMs. In IDC's *2023 U.S. Commercial PCD Survey,* conducted in August 2023, three out of four respondents said they already consider integrated AI capabilities a very important criterion for their next PC purchase. These forward-thinking ITDMs expect AI PCs to drive many benefits, with user productivity at the top (see Figure 1).

FIGURE 1: *AI PC Benefits*
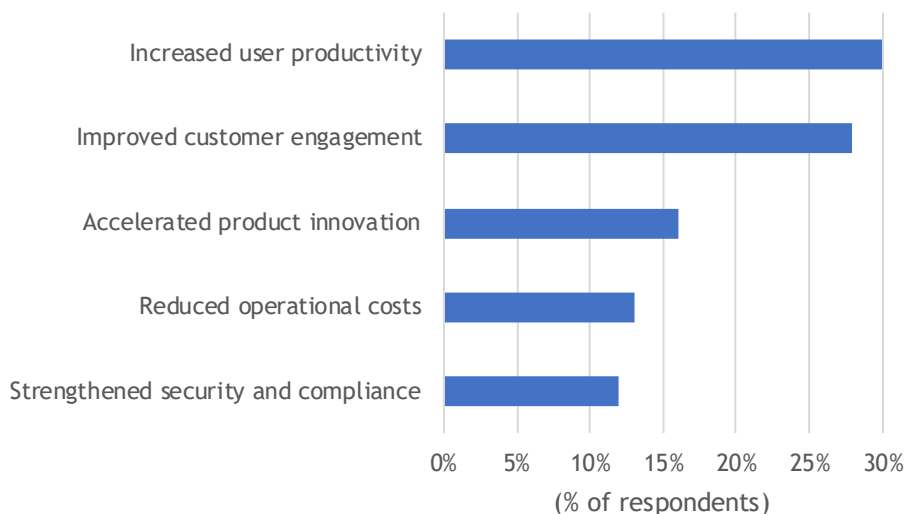


*n = 414 U.S. ITDMs*

*Source: IDC's 2023 U.S. Commercial PCD Survey, August 2023*

There is a long and growing list of potential benefits from moving some AI workloads from the cloud to the client. Perhaps the most notable is cost. Running inferencing in the cloud is not only very powerful but also quite expensive. If companies want to bring GenAI capabilities to an increasing percentage of their workforce in a cost-effective manner, they will need to use local silicon to run some of these workloads. Another benefit is speed — instead of making constant round trips to the cloud, local inferencing is much faster with dramatically lower latency. Another key benefit of local AI processing is enhanced privacy and security. By keeping everything local to the PC, there are fewer chances for company data to be intercepted while moving to and from the cloud.

NPU-equipped AI PCs from all the major vendors are shipping into the market now, and commercial-centric products will arrive by mid-2024.

## AI-Led App Evolution

Major ISVs are working to adapt their current and future applications to leverage the AI silicon in today's PCs. Initiatives are underway by industry leaders such as Microsoft and Intel to help build out the tools and ecosystem support to enable software vendors of all sizes to participate in this seismic shift in on-device AI capabilities. The extent to which these AI capabilities drive workforce benefits is highly dependent upon the PC ecosystem moving to support the required models, frameworks, and drivers.

ITDMs should be monitoring developments around their company's list of current applications. You can expect the first raft of AI-enabled features to appear in existing apps as developers decide what features and workloads can be better addressed via local silicon capabilities. As these features appear, they will help drive decisions around where they should deploy the first AI PCs in the fleet.

As more AI PCs ship into the market, the installed base grows, and developers get a better sense of how to leverage local AI, and we expect to see entirely new types of commercial apps emerge that may complement or replace existing apps. This is a long-term view that could necessitate change management within an organization.

Finally, in conjunction with more powerful silicon, ITDMs should expect to see some significant changes in PC operating systems as these platforms evolve to take advantage of these new underlying capabilities. Such changes could represent notable improvements to critical areas such as collaboration and productivity but will undoubtedly come with something of a learning curve for existing users that ITDMs will need to address via education.

## Planning for an AI PC Future

While we've discussed the benefit of running AI locally, it's important to recognize that many AI workloads will remain cloud first or a hybrid of local and cloud. In other words, all connected PCs are already "AI PCs" to some extent. A key bottleneck to leveraging these features will always be connectivity, which means — as always — that the next round of company PCs should support the latest connectivity standards.

As companies increasingly leverage AI and GenAI capabilities across their workforce, companies must consider the ramifications of local AI to current workstreams and the impact on data sovereignty. Will your company leverage open source large language models, customize those models, or build their own? Where will these models live, and might you push smaller versions to individual PCs?

Finally, as the first commercial AI PCs appear in the market, it's important to consider which employees would benefit most from receiving the first shipments. Careful planning around the next 12–24 months will be crucial to set up your organization to reap the benefits of these new PCs throughout their useful life span.

## Summary

Every refresh of your company's PC installed base is important, but the one you face now is of particular significance. Over the past four years, PCs have evolved dramatically to better suit today's workforce, with improved collaboration features designed to drive improved productivity while keeping employees connected and keeping employees' data safe and their hardware easier to manage by IT. Perhaps even more notable is the new silicon that will support local AI and GenAI workloads designed to help employees work smarter, not harder. As new AI-infused apps arrive, it will be critically important that your company is positioned to embrace them with the latest PC hardware.

## Sources

»    *IDC's 2023 U.S. Commercial PCD Survey — AI PC Results* (IDC #US51194123, September 2023)

»    IDC's Worldwide PCD Tracker, November 2023

# About the Analyst

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Tom Mainelli manages IDC's Device and Consumer Research Group. The device research includes PCs, tablets, smartphones, wearables, smart home products, thin clients, displays, and virtual and augmented reality headsets. IDC's consumer practice tracks end-user trends, the brands people trust, and the impact of technology on society.

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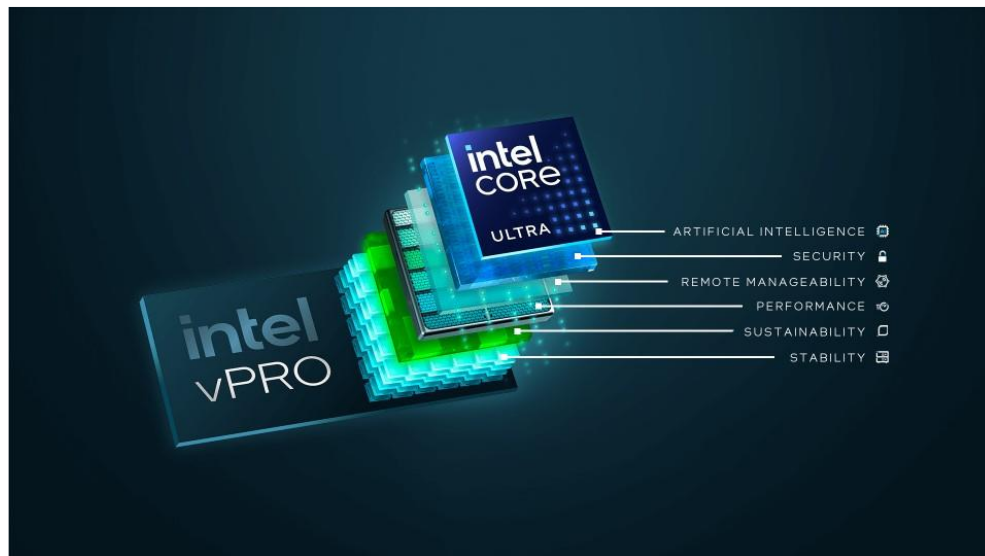


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