

REGION FOCUS: WORLDWIDE

The Business Value of ChromeOS



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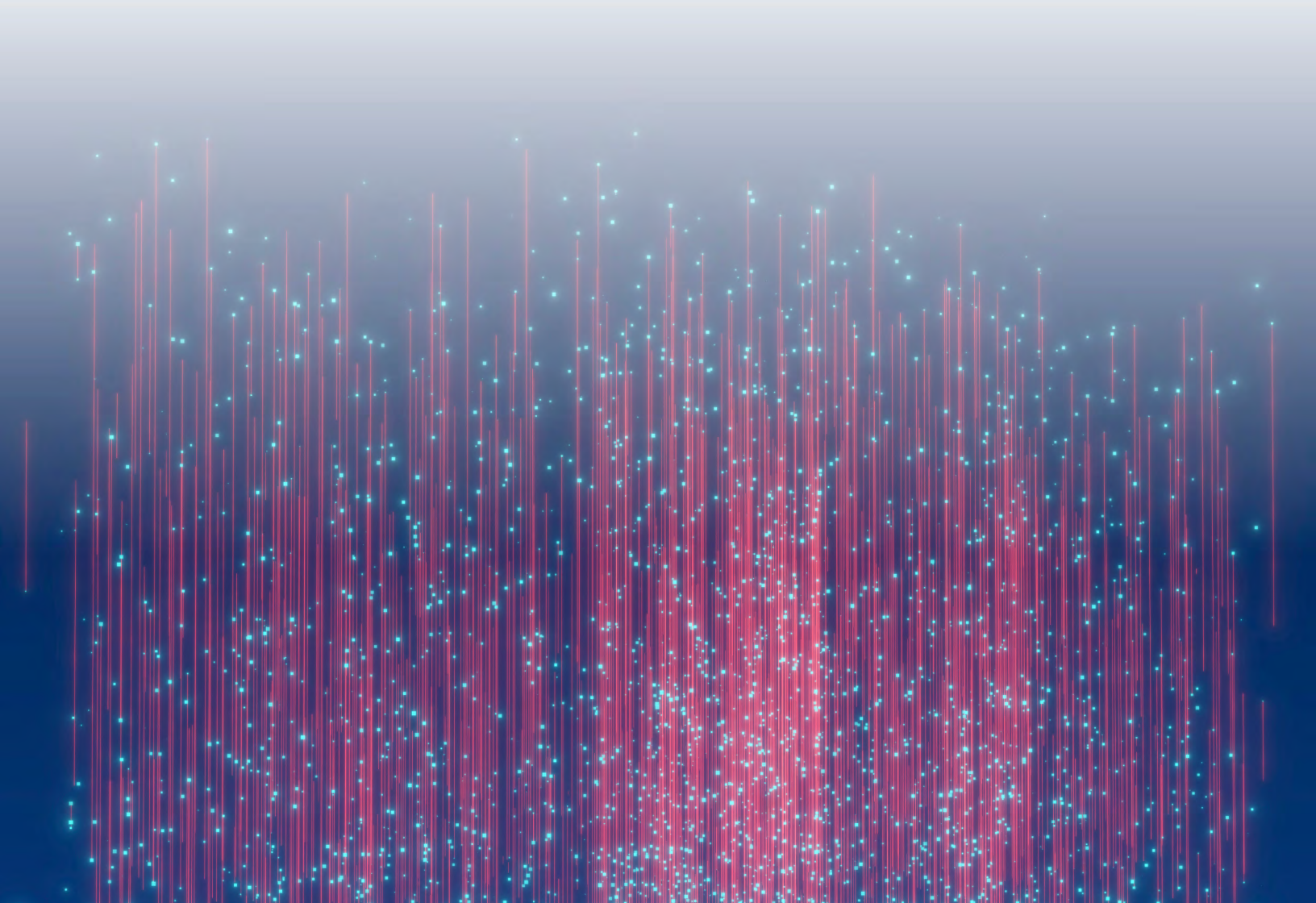


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Executive Summary

Google commissioned IDC to survey organizations across a variety of industries to understand the potential return on investment (ROI) of deploying ChromeOS and ChromeOS devices, as well as their impact on improved security, employee productivity, and remote management. IDC's research focused on the use of ChromeOS for four core business use cases: contact center operations, kiosk and digital signage, virtual desktop infrastructure (VDI), and hybrid and remote workers.

IDC's research demonstrates that ChromeOS enables employees and businesses with a high-performing, user-friendly, and flexible operating system. Cost and operational efficiencies in deploying, running, and supporting devices were also achieved.

Study participants consistently named the following as impactful benefits of using ChromeOS:

- **Improved device performance**, including fewer reboots, faster log-ins, and less frequent interruptions and reimaging
- **Enhanced security**, ensuring that organizations face fewer security threats and breaches and can ensure device security more efficiently
- **Faster device deployment** and the ability to provide new devices to employees with less delay
- **Reduced burden of device management and support**, meaning that IT must spend less time on a day-to-day basis on tasks such as patching, updates, and helping users
- **Optimized device costs**, helping organizations deliver high-performing new devices to more employees and benefit from reduced overall spend on devices

The research shows that study participants' use of ChromeOS and ChromeOS devices for the specific use cases mentioned results in higher employee productivity levels and better business results. These results demonstrate the strong business value of ChromeOS and ChromeOS devices.

Business Value Highlights

Click each highlight below to navigate to related content within this document.

- ↑ **245%**
three-year ROI
- ↑ **\$3,901**
three-year total benefits per ChromeOS device
- ↓ **44%**
lower three-year cost of operations
- ↑ **77%**
higher productivity, faster reboots
- ↓ **25%**
fewer reimages required
- ↓ **24%**
fewer security attacks
- ↑ **63%**
faster to deploy than other operating systems
- ↑ **36%**
more efficient management
- ↓ **37%**
lower weighted device costs

Situation Overview

Many aspects of Google's ChromeOS epitomize this new model of endpoint computing. With an underlying operating system (OS) based on the Chrome browser, devices running on ChromeOS provide end users with a focused, optimized, and responsive cloud-centric computing experience. On the back end, the minimal OS footprint allows for simplified management and streamlined IT support with less downtime and fewer interruptions to work. Because data is not stored locally on ChromeOS devices, risks such as ransomware or device-focused attacks based on OS vulnerabilities become minimal, if not nonexistent.



With an underlying operating system (OS) based on the Chrome browser, devices running on ChromeOS provide end users with a focused, optimized, and responsive cloud-centric computing experience.

ChromeOS Devices

ChromeOS devices, for the purposes of this study, are defined as endpoint computing client devices running ChromeOS.

This primarily includes the familiar Chromebook device form factor, a laptop PC running ChromeOS, and the following device types:

- **Chromeboxes:** Mini PC form factor devices that run ChromeOS but connect to external peripherals such as monitors, keyboards, mice, USB headsets, and other workspace-related equipment
- **Chromebases:** An all-in-one form factor device that integrates a CPU running ChromeOS with a built-in/built-on monitor or display (keyboard/mouse or other HID equipment are attached separately)

The Business Value of ChromeOS

Study Demographics

Our research is based on in-depth interviews with 19 organizations and a web survey of 379 organizations that explored the value and benefits of using ChromeOS with a focus on the following use cases:

- Running a customer experience center
- Kiosk and digital signage
- Virtualization or VDI workloads
- Hybrid and remote work

The research was designed to obtain an in-depth and practical understanding of the impact for study participants of using ChromeOS and ChromeOS devices, including Chromebooks, Chromeboxes, and Chromebases. We used this research to develop a model that extrapolates the average value and costs for study participants of deploying and using ChromeOS.

For additional details about our research and methodology, and for more in-depth information about the organizations that participated in in-depth interviews and the web survey, see **Appendix 1**.

Choice and Use of ChromeOS

Study participants described various reasons for choosing to provide employees with devices running ChromeOS, but they commonly mentioned user experience, device performance, device security, manageability, and cost optimization.

Interviewed ChromeOS customers provided the specific grounds on which they chose devices running ChromeOS:

Cost, cloud first, and supporting more remote workers, VP of IT, media, United States, remote/hybrid:

“Pricing, the relatively cheaper cost was important to us in choosing ChromeOS. Our IT is moving to a cloud-first strategy; we have most of our apps in the cloud, and employees are accessing them through a browser. Next, the COVID-19



We’re expanding really fast. A lot of the functions our workers need do not require a full laptop experience. We decided that the best way to support our remote workers was to give them ChromeOS devices. This way, they can do the work with minimal IT support.”

event led to us having more remote workers. We've always had an above-average number of remote workers. So having a remote device that's easy to manage, inexpensive, and secure is important."

Ease of employee adoption as IT foundation, healthcare, United States, customer experience center:

"We're finding out that onboarding, training, and the shift from legacy software are all smooth with ChromeOS. We're looking at what's out in the market and where the need is ... but it's forward looking in terms of speed, simplicity, and security."

Demand for customer self-service, technology head, consumer products company, EMEA/worldwide, kiosk:

"Devices running ChromeOS make our stores more interactive and allow customers to make purchases and schedule appointments. We have loyal retail customers and a few digital customers; we want to move into a blended model, so the tech piece is also being used as a support to grow our omni-channel."

Ease of deployment and management, head of IT, technology, United States, VDI:

"We're expanding really fast. A lot of the functions our workers need do not require a full laptop experience. We decided that the best way to support our remote workers was to give them ChromeOS devices. This way, they can do the work with minimal IT support."

Participants in our in-depth interviews reported significant use cases for ChromeOS, with devices running ChromeOS making up an average of 1,518 devices (median of 775 devices). They reported that they are growing their ChromeOS-installed bases by an average of 12% per year and that an average of 34% of these devices directly replaced another device. By ChromeOS device type, interviewed organizations use Chromebooks most frequently (61% on average), followed by tablets (23%), Chromeboxes (14%), and Chromebases (2%).

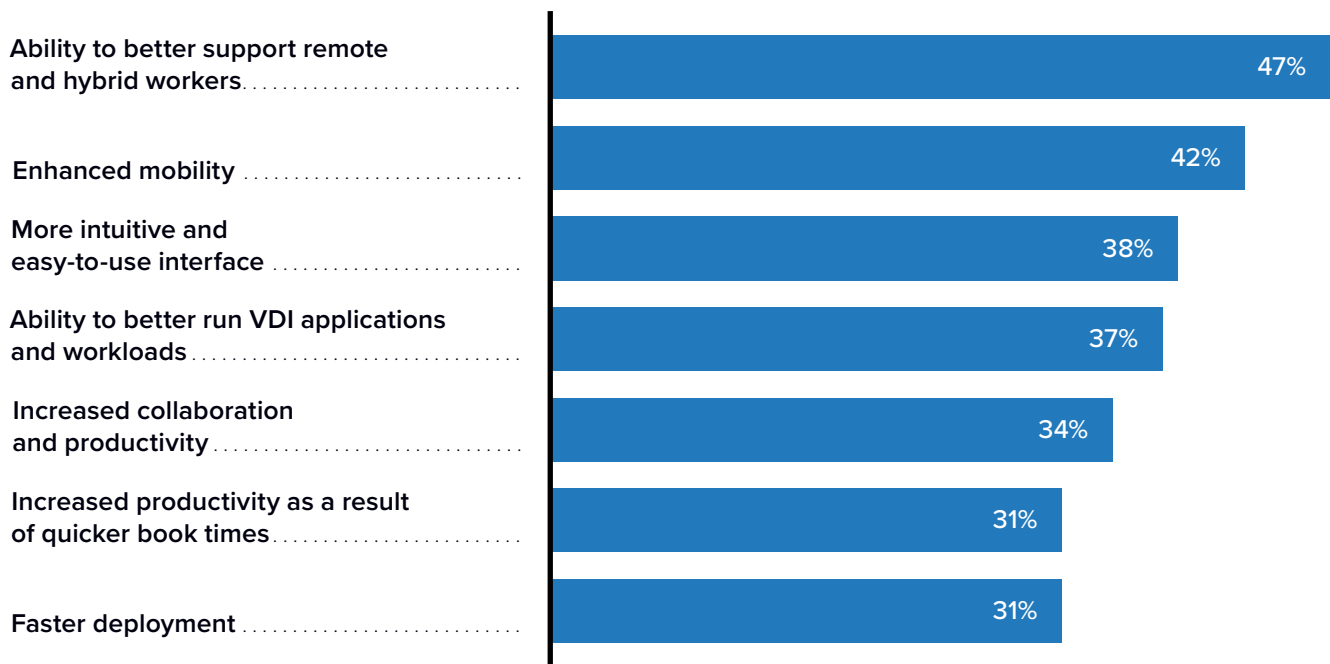
Business Value and Quantified Benefits of ChromeOS

Our research shows that ChromeOS has increased employee productivity, reduced security attacks, and improved total cost of ownership. The results of both our web survey and specific feedback from interviewed ChromeOS customers support these overall findings.

When asked about the most significant benefits of using ChromeOS, web survey participants most frequently named employee and business enablement results, including (see Figure 1):

- Better support for remote and hybrid workers: **47%**
- Enhanced employee mobility: **42%**
- Access to intuitive and easy-to-use interface: **38%**
- Running VDI applications and workloads better: **37%**
- Increasing collaboration and productivity: **34%**

FIGURE 1
Most Significant Benefits of Using ChromeOS Devices
(% of organizations)

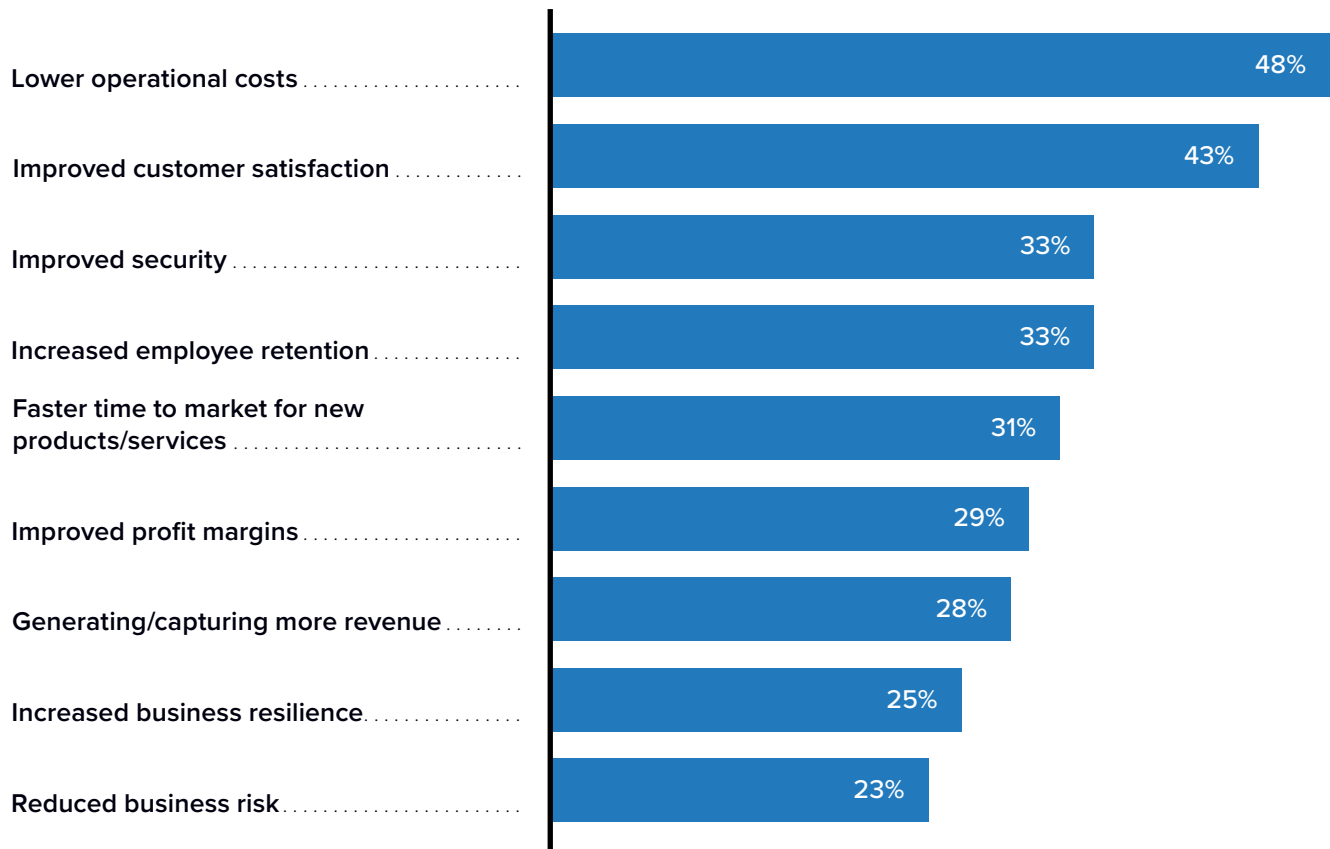


n = 379; Source: IDC Business Value Research, June 2022

Web survey participants returned to similar themes in naming the most important outcomes of using ChromeOS, identifying the following most frequently (see Figure 2):

- Lowering operational costs: **48%**
- Improving customer satisfaction: **43%**
- Improving device security: **32%**
- Increasing employee retention: **33%**
- Reducing time to market for new products and services: **31%**

FIGURE 2
Most Important Outcomes of Using ChromeOS Devices
(% of organizations)



n = 379; Source: IDC Business Value Research, June 2022

Feedback from interviewed organizations echoed these themes of employee and business enablement alongside cost and staff efficiencies.

Interviewed organizations provided specific examples of how they have benefited from using ChromeOS for the use cases covered in our research:

Improved employee performance and profits, food and beverage, Spain, hybrid/remote:

“ChromeOS increases our performance. This is important when it comes to selling products in the field. These devices are the right tools for the business, impacting performance, sales delivery, and profits.”

Improved employee and customer experiences, technology head, consumer products company, EMEA/worldwide, kiosk and digital signage:

“Chromebooks are faster, better, and smarter. Every positive adjective. They don’t break down: a classic example is that we had issues with retail technology going down on Black Friday, which is disastrous. We found significant improvement in this past year with Chromebooks as point-of-sale devices and customer-facing kiosks.”

Improved deployment and lower security risk, VP of IT, real estate, United States, VDI:

“Devices running ChromeOS come packaged and installed; we can put them in a case and ship it out at low cost and low risk. They are easy to implement, with a quick turnaround. The physical size of the device is ideal We found it to be a simple, straightforward solution with a better end-user experience that allowed us to conduct more training onsite, and at the same time, created a secure platform separate from our transactions that’s lower risk and PCI compliant.”

Ease of use and reliability, IT director, real estate, United States, customer experience center:

“In the real estate industry, employees tend to be very low tech to almost anti-technology, and ChromeOS devices are incredibly simple and very difficult to break. They’re reliable and easy to deploy. You log in and all your data is there, and if it breaks, you just get another one.”

Improved Performance

Study participants reported that ChromeOS and ChromeOS devices provide their employees and businesses with required performance levels and experience fewer interruptions than other operating systems and devices. They connected performance-related improvements with ChromeOS to the quality of the devices and operating system as well as automated updates that do not require patching. As a result, they count on devices running ChromeOS to provide a strong user experience, run a variety of business applications and workloads, and serve as reliable, highly available business tools.

Study participants provided specific examples of how ChromeOS has met and exceeded their device performance requirements:

Greater reliability and management with less downtime, CIO, healthcare organization, Australia, kiosk and digital signage:

“We do far fewer reboots with our Chromebooks. With our previous [other vendor] devices, we had to do more reboots, and they had to be done at the facility where someone had to go to the device and press the reset button or unplug it in cases when they couldn’t reboot it properly. With the current Chromebooks, we can do a reset much more simply through the device management software.”

Improved productivity and collaboration for a mobile workforce, food and beverage, Spain, hybrid/remote:

“The productivity of our hybrid and remote workforce improves with improved user experience; you get your daily tasks done on time, you have greater mobility, good collaboration. We’ve seen the impact there.”

Strength of security with a single ecosystem, head of IT, technology, United States, VDI:

“With ChromeOS, we have a single ecosystem for all our needs. The platform itself is very lightweight, so you don’t need high-powered hardware. This is well-integrated with our videoconferencing through Google Meet, which is natively supported. Security on Chromebooks was the best for us to manage.”

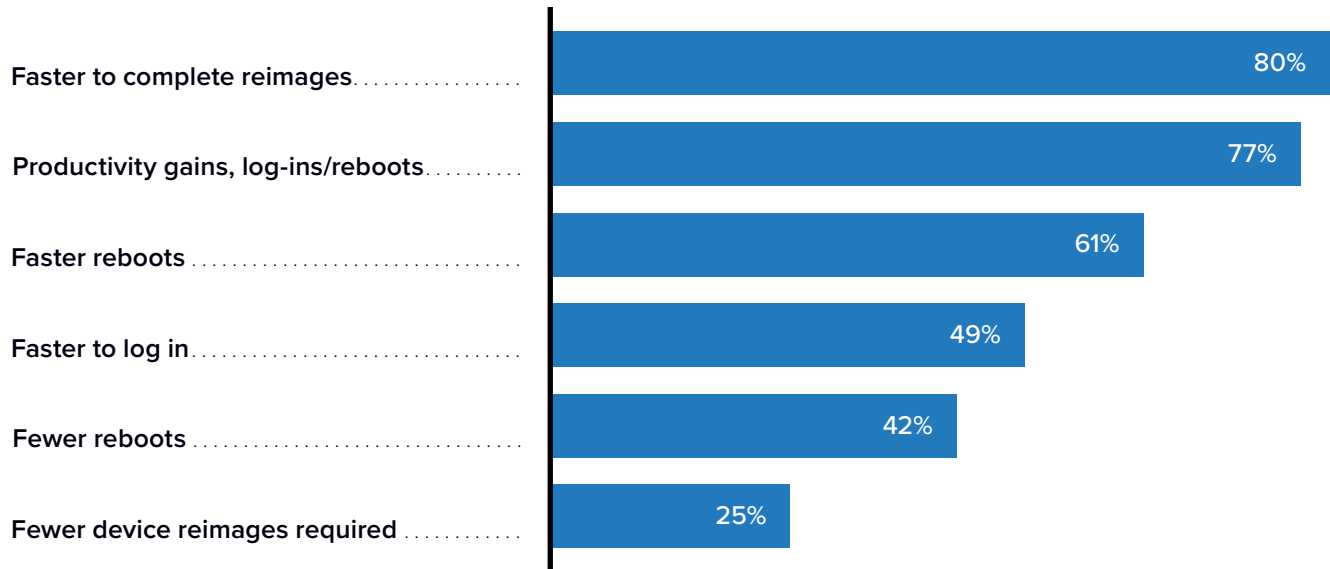
Study participants evaluated device performance both in more intangible terms (e.g., do the devices perform as needed based on their use) and specific trackable metrics (including the time required to log in, frequency and time required to complete device reimages, the frequency and duration of device reboots, and the overall amount of productive time lost due to these types of events).

In each of these categories, study participants reported that ChromeOS outperformed legacy or other devices, including:

- **25%** fewer device reimages required, and **80%** faster to complete reimages
- **49%** faster to log in
- **42%** fewer reboots, and **61%** faster reboots

Overall, our research shows that ChromeOS users gain back 77% of productive time lost by reducing reboots and device log-ins when compared with legacy or other devices. While productivity savings are often small when evaluated on a daily or even weekly basis, they add up across thousands of days of device use. Over three years, IDC calculates that users of ChromeOS will see productivity gains worth \$733 compared with their legacy or other devices, which constitutes significant value across hundreds or even thousands of devices (see **Figure 3**).

FIGURE 3
Performance Improvements with ChromeOS Devices
 (% improvement)



n = 19, Survey n = 379; Source: IDC Business Value Research, June 2022

Enhanced Security

Ensuring device security is a constant challenge for all organizations. They must find ways to minimize security threats and limit operational disruptions. Study participants described finding the right balance between security and efficiency to be challenging with their legacy and other devices. They consistently noted that ChromeOS provides more robust foundational security through automated security updates. The cloud-based nature of ChromeOS reduces the amount of data maintained and accessible on devices. Further, they reported that ChromeOS has strong intrinsic security.

Study participants spoke to the importance of enhanced device security with ChromeOS and how it enables them to create more value with their employee and customer-facing devices:

Intrinsically more secure devices, VP of IT, media, United States, hybrid/remote:

“Security is one of the big reasons we use Chromebooks. We see ChromeOS as intrinsically more secure. Chromebooks are typically used to access applications in the cloud, where viruses are less likely. Also, users are storing documents in the cloud, not on their local drives. This helps make them more secure.”

Much lower data exposure and risk, CIO, healthcare, United States, customer experience center:

“The security benefits of ChromeOS are huge. There’s no data on the device; if it gets stolen, nothing is lost. Through management, we have geofencing, limiting use of the device. We can retire it immediately to wipe it if needed. We have very low exposure.”

Peace of mind and better security, CIO, healthcare organization, Australia, kiosk and digital signage:

“I don’t know how you price peace of mind. That’s essentially what we were pricing in considering ChromeOS. We knew we saved money with Chromebooks, so it was a win-win, because they save money and have vastly better security.”

Less security risk, IT director, education, Singapore, VDI:

“Security is the essential benefit of ChromeOS because we have our own in-house build so all the data resides on what we call ‘end cloud.’ You just put the data there and you can talk with the VDI and do your work on the VDI using the Chromebook. The security is much better enhanced because as far as we have seen, there are fewer attacks on Chromebooks compared to [other devices].”

Less prone to impactful attacks, ensuring business continuity, manufacturing, United States, VDI:

“We find that devices running ChromeOS are unaffected by attacks that take down [other] devices; this helps maintain business continuity during disaster recovery.”

From the perspective of security staff, ChromeOS requires less time because it automates responsibilities such as updating that may have required staff time on a regular basis with legacy or other devices. On average, IDC finds that ChromeOS requires 29% less staff time to secure, which saves an average of 1.3 hours of staff time on security per device per year (see **Table 1**, next page).

TABLE 1

Device Security Team Efficiencies

(Average per organization)

	Other operating system and devices	With ChromeOS	Difference	Improvement
FTEs required for securing equivalent devices	3.7	2.6	1.1	29%
Hours per device per year to secure	4.6	3.3	1.3	29%
Hours per device to secure over three years	13.9	9.8	4.1	29%
Cost per device to secure over three years	\$738	\$522	\$216	29%
Cost per organization to secure over three years	\$1.1M	\$0.8M	\$0.3M	29%

n = 19, Survey n = 379; Source: IDC Business Value Research, June 2022

Further, study participants described making significant gains in reducing device-related risk with ChromeOS. They can complete OS and application updates as well as security updates more readily (32% and 26% faster, respectively), which makes it less likely that devices running ChromeOS are exposed to viruses or other security threats. They reported that ChromeOS experiences 24% fewer security attacks on average, reducing the likelihood that a security event will disrupt or otherwise harm business activities. This helps them lower the overall risk associated with impactful security threats, affecting devices by an average of 29%. Given the significant operational, business, and reputational costs that security events can cause, minimizing device-related security risks is an important benefit for study participants using ChromeOS (see **Figure 4**, next page).

FIGURE 4
Security Improvements with ChromeOS Devices

(% improvement)



n = 19, Survey n = 379; Source: IDC Business Value Research, June 2022

Increased Agility

Study participants also emphasized the importance of being able to put new devices in employees’ hands in a timely and efficient manner with ChromeOS. They noted that device deployment often took too long with legacy and other devices, requiring staff to complete multiple steps and ultimately delay delivery of new devices to employees.

Study participants provided examples of how ChromeOS enabled fast device deployment and reprovisioning:

Much faster to begin using device, healthcare, United States, customer experience center:

“Provisioning of devices for new contact center hires is quick with ChromeOS. We have their Chromebook overnighted to them, they log in, and they’re done. This is days faster than when we were doing [previously], even though we procure our equipment in the same way.”

Four to five times faster deployment, CTO, manufacturing, United States, hybrid/remote:

“Deployment is very fast with ChromeOS, almost instantaneous, much quicker than [other] devices, where configuration takes at least four or five times as long. We had no trouble adapting to ChromeOS devices and have automated the credentialing process.”

Agile and cloud-first design providing a modern work experience, manufacturing, United States, VDI:

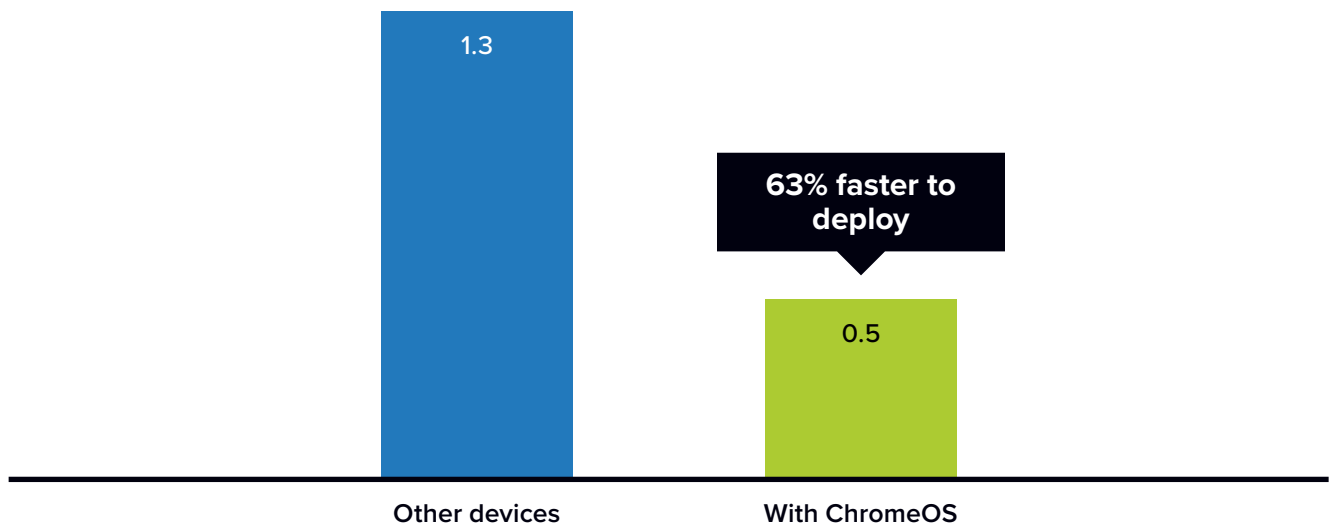
“Devices running ChromeOS are part of our modernization strategy We’re also able to scale deployment easily in response to business demand, as in the case of the increase in remote work during the pandemic, or during a disaster recovery situation in a 24 x 7 production environment. This increased agility is a key benefit.”

On average, study participants reported deploying ChromeOS devices 63% faster than other devices, saving more than 45 minutes per device. Across hundreds or thousands of devices, these time savings for staff responsible for device deployment add up to significant value, in addition to the importance of providing employees and business operations with devices in a timely manner (see **Figure 5**).

FIGURE 5

Time to Deploy

(Hours per device deployed)



n = 19, Survey n = 379; Source: IDC Business Value Research, June 2022

Ease of Management and Support

Study participants noted that ChromeOS requires less staff time to manage and support on a day-to-day basis. Again, these efficiencies tie back to enhanced automation and orchestration with ChromeOS, which enables staff responsible for device management to spend less time on tasks such as updates and more time supporting other business initiatives and activities. Meanwhile, strong performance with ChromeOS means that users report fewer issues to support teams.

Study participants spoke to the value of ChromeOS in terms of device management and support:

Ease of deployment and management, head of IT, pharmaceutical, United States, customer experience center:

“Chromebooks are very low maintenance, and there’s no real need to have to touch every single one of them. For example, when an employee leaves, we literally just turn it on and it gets that command from the Google Admin console and we reset the device and just put it back into our inventory. With [other devices], we have to get this done with another software solution that is like an endpoint backup ... and it’s quite involved because we have to back up everything and reimagine the machine that will get ready for the next person.”

80% time savings, telecommunications company, IT manager, India, kiosk and digital signage:

“Compared to using laptops, we achieve 80% time savings for management with Chromebooks Also, device management staff are now handling different applications. Before, some people were dedicated to some of those activities, but now there is no need to go with the separate manpower for that.”

Zero-touch devices, IT director, real estate, United States, customer experience center:

“Chromebooks are almost zero touch. I’ve literally had one of our managers just stop at a store to get one—he walked in, picked it up, walked out, and went back to his desk and set it up. It was so simple and easy for him to do that. If it was [another] machine, we’d have to put our remote software on it, and that would take my team an hour to configure and download and set everything.”

No-patch OS that results in time savings, CTO, travel, United States, hybrid/remote:

“Patch management is pretty laborious on [other PCs], so we have a full-time team of four to five that does that. The same team runs our Chromebooks, but patching is not really required.”

Study participants reported that ease of managing ChromeOS allows them to spend 36% less time on device management, saving an average of two hours per device each year. These management efficiencies, combined with deployment and security efficiencies, save teams a significant amount of time. More details around device management team efficiencies are shown in **Table 2** (next page).

TABLE 2
Device Management Team Efficiencies
 (Average per organization)

Average per organization	Before/without ChromeOS devices	With ChromeOS devices	Difference	Improvement
FTEs required for managing equivalent devices	4.3	2.8	1.6	36%
Hours per device per year to manage	5.4	3.4	2.0	36%
Hours per device to manage over three years	16.1	10.2	5.9	36%
Cost per device to manage over three years	\$855	\$543	\$312	36%
Cost per organization to manage over three years	\$1.3M	\$0.8M	\$0.5M	36%

n = 19, Survey n = 379; Source: IDC Business Value Research, June 2022

Optimization of Device Costs

Study participants also regarded the cost-effective nature of devices running ChromeOS as integral to their value proposition, especially when combined with performance, user experience, and management efficiency gains. Customers said ChromeOS devices often offered better functionality for hundreds of dollars less than their legacy or alternative devices.

Interviewed organizations spoke in detail about the cost advantage of devices running ChromeOS:

Device cost savings while still getting the right device, VP, technology and innovation, transportation, United States, kiosk and digital signage:

“The price point’s great with ChromeOS devices. That really wasn’t our consideration for this; had it been \$200 more, we still would’ve bought it because that’s the thing we needed Our other devices were \$800–900 compared with \$400 on average for ChromeOS devices.”

One-third of the cost without sacrificing performance, head of IT, pharmaceutical, United States, customer experience center:

“If you look at the cost of [other devices we’ve used], we’re looking at \$1,500–1,600 per device with the minimum configuration. With a Chromebook, you’re looking at \$420 per device, so it’s a third of the cost and that’s a significant difference. They are touchscreen as well, and some of our applications work a little bit faster with touchscreen versus [other devices] that do not come with touch.”

Significantly lower cost for capabilities, CTO, travel, United States, hybrid/remote:

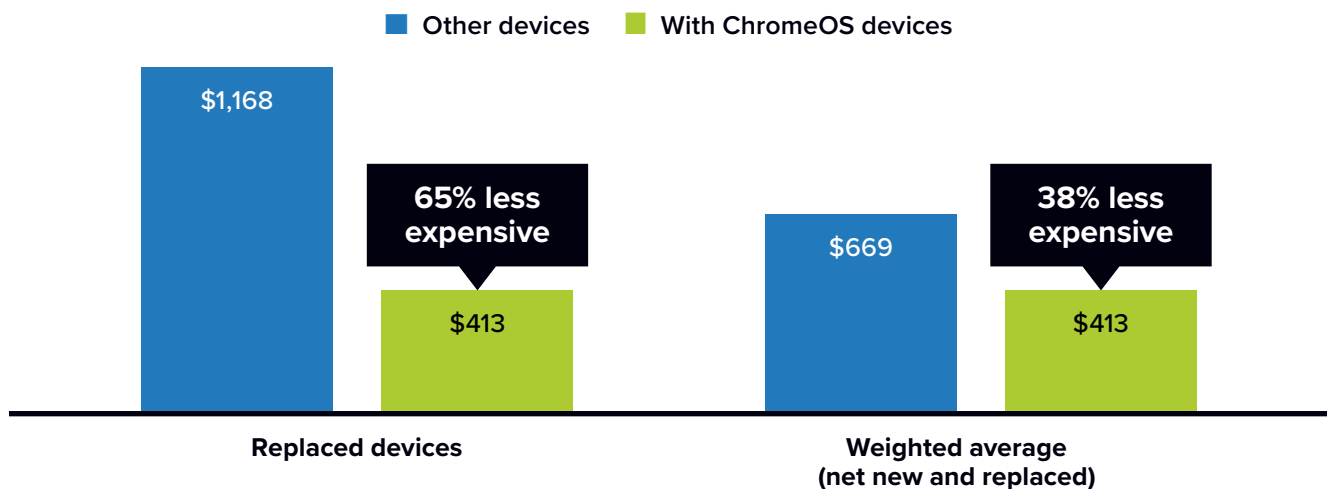
“We basically look at the cost of providing capabilities. You could pay \$1,500, or you could pay \$300–400 with ChromeOS devices. That’s really what it boils down to, and ensuring we have strong security.”

Cost effective and the right devices for field workers, VP of IT, utilities, United States, hybrid/remote:

“The hard cost of a Chromebook is up to \$400 compared to a PC desktop which is twice that ... Because Chromebooks are lightweight and able to go anywhere, all you need is internet connectivity. Our workforce is able to take these devices into the field and provide real-time service and support to our field technicians, whereas before they did not have that capability.”

ChromeOS devices cost 65% less on average than the devices they replaced. Our analysis shows that ChromeOS devices are 38% less expensive than other devices replaced or otherwise used, costing an average of \$256 less per device (see **Figure 6**).

FIGURE 6
Initial Device Costs
(Cost per device)

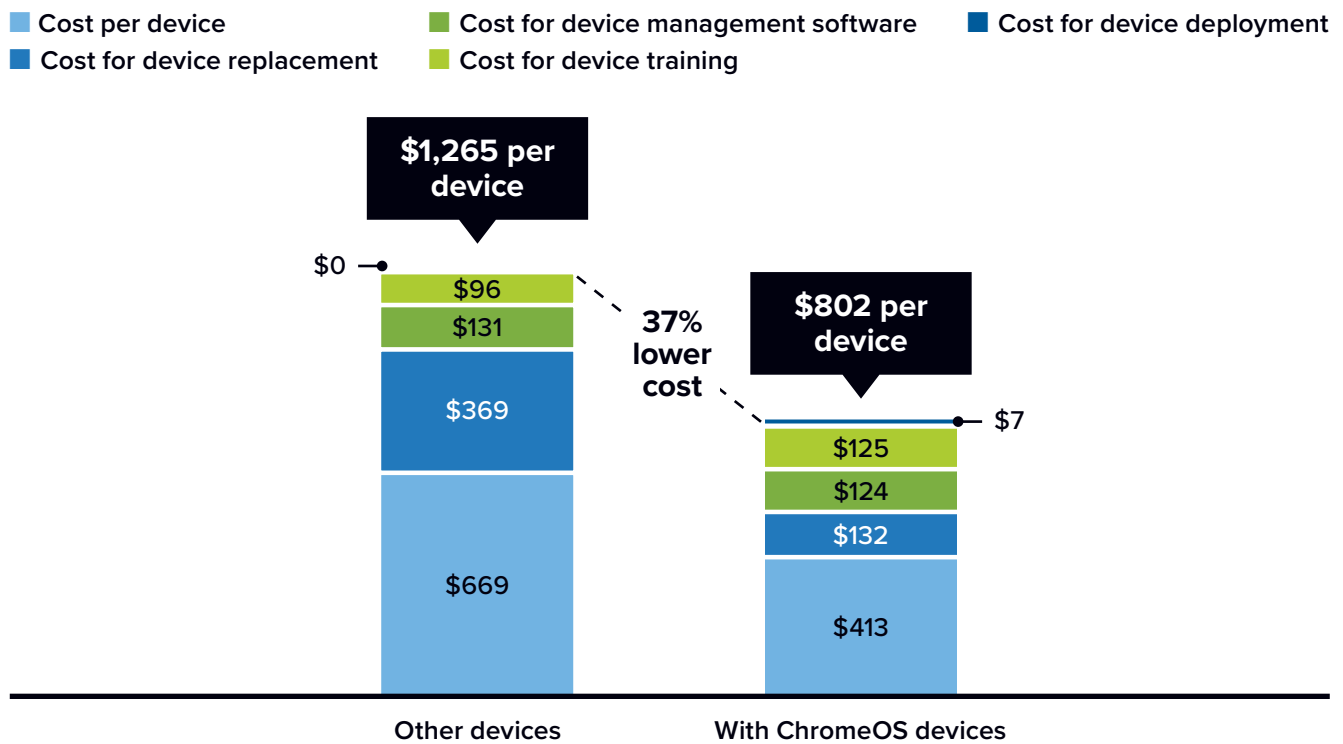


n = 19; Source: IDC Business Value Research, June 2022
For an accessible version of the data in this figure, see [Data from Figure 6](#) in Appendix 3.

In addition, our research shows that devices running ChromeOS do not have to be replaced as often as other devices due to breaking or security breaches. On average, study participants reported needing to replace 39% fewer ChromeOS devices (11% versus 6%), meaning that they avoid the costs associated with replacing around 60 devices each year.

Overall, IDC’s analysis shows that the total cost of buying and running ChromeOS devices over three years incurs 37% lower costs than other devices, with ChromeOS devices costing \$802 per device compared with \$1,265 per other device — that is \$463 in savings per device (see Figure 7).

FIGURE 7
Device Costs over Three Years
 (Cost per device)



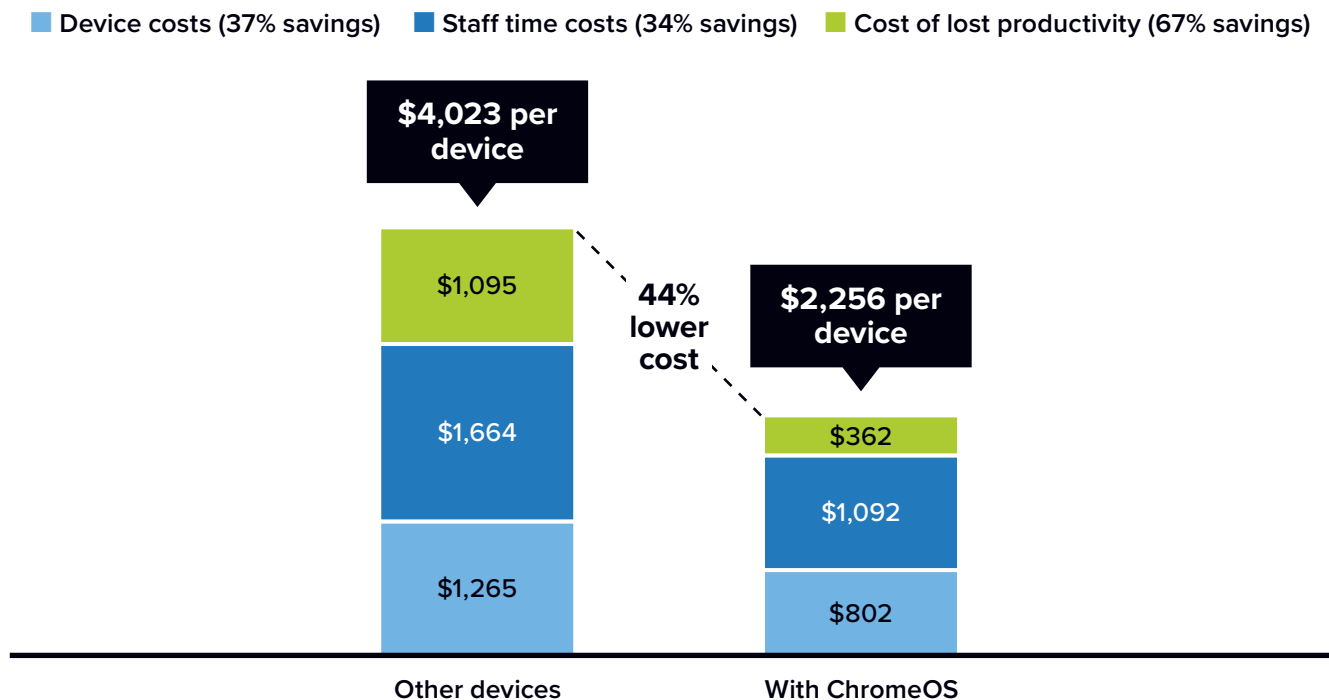
n = 19; Source: IDC Business Value Research, June 2022
 For an accessible version of the data in this figure, see [Data from Figure 7](#) in Appendix 3.

Lower device costs, faster deployment, improved management and security, and increased productivity have enabled study participants to run devices with ChromeOS at a significantly lower cost over three years.

On average, IDC calculates that ChromeOS devices cost 44% less over three years, providing cost savings, time efficiencies, and productivity gains worth an average of more than \$1,700 per device over three years, with savings in terms of (see Figure 8):

- **Device costs.** 37% lower costs over three years for equivalent numbers of devices
- **Staff time costs.** 34% lower costs for staff time required to deploy, manage, support, and secure devices
- **Cost of lost productivity.** 67% of productive time gained back related to device outages, reimaging, and reboots

FIGURE 8
Total Three-Year Cost of Operations per Device
 (Cost per device over three years)



n = 19, Survey n = 379; Source: IDC Business Value Research, June 2022
 For an accessible version of the data in this figure, see [Data from Figure 8](#) in Appendix 3.

Use Case-Specific Business and Operational Gains

Our research shows that organizations using ChromeOS can achieve significant employee productivity gains and improved business outcomes. For this study, IDC evaluated the impact of using ChromeOS for four use cases: contact centers, kiosk and digital signage use, VDI applications, and hybrid and remote workforces.

We have detailed the benefits of using ChromeOS for each of these use cases in separate Use Case Briefs.

A brief summary of the value study participants achieved by using ChromeOS for these use cases is as follows:

- **Running contact centers:** Study participants reported that ChromeOS provides the right mix of functionality, performance, and cost for their contact centers. They attributed gains in contact center agent productivity and effectiveness to an improved user interface, access to contact center-specific functionality, and less device downtime. These benefits enable agents to make more effective use of their contact center solutions and respond to inquiries with agility. Among key results for these organizations, IDC calculates that use of ChromeOS helps drive an average 19% productivity gain for agents, reflecting their ability to work more effectively and contribute to their organizations' success. This means that teams of 631 agents using devices running ChromeOS perform as effectively as 750 agents using other devices.
- **Serving as customer- and employee-facing kiosks and digital signage:** Study participants reported consistently that ChromeOS enables cost-effective and strong-performing kiosks and digital signs for their varied operational needs. Study participants acknowledged that achieving seamless, secure displays is not an easy feat, but ChromeOS has proven up to the task. Our research confirms business and operational gains specific to the use of ChromeOS for kiosk and digital signage experiences including higher sales, increased customer engagement, and employee productivity gains. Findings that quantify these benefits include 26% fewer outages affecting kiosks and digital signs and annual revenue gains of \$5.09 million per organization linked to improved customer experience.
- **Running VDI:** Study participants reported that ChromeOS provides a cost-effective, secure, and reliable means of accessing virtualized applications for their employees. This is especially important as use of VDI continues to grow. For study participants, the most significant impact of using ChromeOS for VDI comes in the form of higher user productivity as employees take advantage of robust, uninterrupted access to their VDI solutions. Our analysis shows that VDI users with ChromeOS see an average productivity gain of 31%, reflecting their much-improved capabilities and effectiveness.

- **Supporting hybrid and remote workers:** Working successfully both in and out of the office requires a robust OS. Study participants reported that devices running ChromeOS have proven to deliver the right blend of cost, security, flexibility, and performance. Study participants said they cannot afford to sacrifice device performance or security in the name of cost. Interviewed ChromeOS customers reported unanimously that ChromeOS devices have become a preferred device type for their hybrid and remote workers, with a value centered on cost efficiency, flexibility, and performance. Study participants reported that ChromeOS has enabled their hybrid and remote employees to work more effectively, citing an average 14% productivity gain.



Working successfully both in and out of the office requires a robust OS. Study participants reported that devices running ChromeOS have proven to deliver the right blend of cost, security, flexibility, and performance.

Value Proposition of ChromeOS Flex

In addition to its research on devices running ChromeOS, we also conducted three interviews with organizations that are using ChromeOS Flex. ChromeOS Flex enables organizations to upgrade Macs and PCs with ChromeOS. Interviewed organizations reported that their early experiences with ChromeOS Flex added significant business value and benefits.

Interviewed ChromeOS Flex users reported that they actively considered the cost savings associated with not having to purchase new devices and stressed that their choice of ChromeOS Flex also took into account sustainability, security, and flexibility:

Beneficial in terms of cost, security, and sustainability:

“The business impetus for using ChromeOS Flex was to save expenses and avoid a large fleet renewal we would have to do otherwise. ChromeOS Flex let us not do most of that renewal, so we avoided a lot of expenses for new hardware. It was a security impetus as well, and even sustainability because we avoided [buying] new hardware.”

Placing less emphasis on hardware and ability to reuse/recycle devices:

“ChromeOS Flex is a smart move by Google Everything in the OS is basically in the cloud, so you can use the operating system without having to worry about the underlying hardware infrastructure We are also big on the sustainability side, so it’s basically about recycling of the device. We don’t have to buy many devices, people can choose their own device, or maybe use whatever they have at home and not buy a new device.”

Meanwhile, interviewed ChromeOS Flex users noted cost savings and operational improvements. As a result, many of the value points they mentioned — ease of deployment, ease of management, and strong user experience — echo those discussed most frequently by users of ChromeOS, including:

Ease of deployment, ease of management, and sustainability:

“ChromeOS Flex has been very easy to deploy to all our offices and employees compared to the other options we had. The sustainability angle was definitely also something that drove the business case The IT team manages the ChromeOS Flex devices, and you set it up once, and then it just works The bottom line is that we are saving a significant amount of money on devices with ChromeOS Flex.”

Automatic updates that reduce downtime by 50%:

“There is an advantage on the updates with ChromeOS Flex devices because we do it weekly. The ChromeOS Flex devices take the update immediately, where before it was about a 15-minute cycling time to get back in. It’s now down to about five minutes We’d also run into reimaging issues ChromeOS Flex has saved us 50% in time, and I expect that to go lower as the IT administrators get more experience with it.”

IT able to manage from anywhere:

“ChromeOS Flex devices are making life easier for IT folks As an organization, we are moving all of our workflows toward the cloud. If we can move to the cloud and have it centralized, it makes it easier to manage from an IT perspective.”

While the sample of ChromeOS Flex customers considered for this study was small, the average improvements in the following areas line up consistently with those from the broader study of ChromeOS customers, demonstrating a similar overall value proposition:

- **72%** faster log-in times than previously
- **34%** fewer security attacks
- **42%** more efficient to manage
- **47%** fewer devices requiring reimaging
- **68%** faster to deploy per device
- **44%** device cost savings over three years

ROI Summary

Table 3 provides our analysis of the benefits/savings and investment costs associated with study participants' use of devices running ChromeOS. On average, we calculate that they will realize discounted savings over three years in higher productivity, revenue gains, staff time savings, and device cost savings worth \$8.34 million per organization (\$5,495 per device). These savings compare with total three-year average discounted investment costs of \$2.42 million (\$1,595 per device). At these levels of benefits/savings and investment costs, we calculate that study participants will realize average total savings worth \$5.92 million per organization (\$3,901 per device), which equals an average three-year ROI of 245% and breakeven on their investment in ChromeOS in an average of two months.

TABLE 3
Three-Year ROI Analysis

	Average per organization	Average per device
Benefit (discounted)	\$8.34M	\$5,495
Investment (discounted)	\$2.42M	\$1,595
Net present value (NPV)	\$5.92M	\$3,901
ROI (NPV/investment)	245%	245%
Payback period	2 months	2 months
Discount rate	12%	12%

n = 19, Survey n = 379; Source: IDC Business Value Research, June 2022

Challenges/Opportunities

Transformation of endpoint management and security support teams.

While the new model of cloud-based device provisioning, management, and security promises to free up IT resources and staff, the transition to this new model will not be instantaneous. Many organizations have built up substantial IT support models, supporting technology infrastructure and staff to manage full-client endpoint devices and associated technologies. Training and thoughtful transition planning will be required for IT support and security teams supporting cloud- and ChromeOS-based customer experience center agents under this new paradigm.

Transition from device-based to cloud/online-based threats.

Eliminating vulnerabilities at the device level (e.g., ChromeOS' secure footprint) will not eliminate all security challenges. Organizations must still be vigilant to online-based threats to workers, including malicious spam and phishing attempts, as well as bad actors. Security tools and tactics must shift toward network-based security, with emphasis on AI and automation for detecting new types of cloud-based threats.

Validating support for peripherals and other end-user workspace environment technologies.

Organizations that have deployed dedicated thin clients with associated peripherals and supporting devices should test and validate existing technology with ChromeOS devices. This ensures compatibility and usability when considering a shift to ChromeOS for VDI endpoint delivery.

Ensuring support for VDI with existing software and/or cloud service technology providers.

IT organizations should look to their providers of VDI software to ensure support for ChromeOS devices as VDI clients. Organizations hosting their own VDI environments, or using cloud desktop service providers, should ensure the back-end delivery of VDI environments to ChromeOS devices meets all employee and/or contractor use case requirements and workload scenarios.

Kiosk and digital signage use case device validation.

To ensure successful deployment of ChromeOS for kiosk and digital signage, organizations will have to work closely with third-party service providers of content and digital experience technology to ensure that the digital experiences being delivered

to ChromeOS-enabled endpoints are optimized for varying kiosk and digital signage use cases. Service providers and partners should have a focus on dynamic cloud delivery business models and capabilities.

Emphasis on network and connectivity resources for IT support, management, and security.

IT organizations that shift to cloud-centric technologies such as ChromeOS will have to shift much of their focus on support, security, and management to the cloud as well. This makes network connectivity and availability a paramount priority for overall IT operations groups. The shift to zero trust network architectures, adoption of new connectivity models such as SD-WAN and 5G, and enhancement of network monitoring, anomaly/threat detection, and end-user support and communications tools should be new areas of investment and focus for teams adopting ChromeOS at scale.

Conclusion

This study demonstrates the strong value proposition of ChromeOS for both specific business use cases and day-to-day employee use. Study participants connected ChromeOS to significant cost and operational efficiencies in providing, managing, and securing devices across their organizations. Further, they reported that ChromeOS has enabled increased levels of agility, availability, and performance required to run their businesses and ensure high levels of customer satisfaction.

Our findings show that study participants can run devices with ChromeOS at a 44% lower cost over three years, saving over \$1,700 per device. Moreover, interviewed ChromeOS customers will also achieve a strong average three-year return on their investment of 245% due to cost savings, operational efficiencies, reduced risk, and improved business results. These results underscore the strong value proposition of ChromeOS both as an enabler of key enterprise use cases that include kiosk and digital signage, customer experience centers, running VDI, and hybrid and remote workers and as a tool for employees to leverage to work efficiently and effectively on a day-to-day basis.

Appendix 1: Methodology

IDC's standard Business Value/ROI methodology was utilized for this study. This methodology is based on gathering data from organizations currently using ChromeOS devices as the foundation for the model.

Based on interviews with organizations using ChromeOS devices, IDC performed a three-step process to calculate the ROI and payback period:

- 1. Gathered quantitative benefit information during the interviews using a before-and-after assessment of the impact of using ChromeOS devices.** In this study, the benefits included employee productivity gains, higher revenue, staff time savings, and reduced device-related costs.
- 2. Created a complete investment (three-year total cost analysis) profile based on the interviews.** Investments go beyond the initial and annual costs of using ChromeOS devices and can include additional costs related to migrations, planning, consulting, and staff or user training.
- 3. Calculated the ROI and payback period.** IDC conducted a depreciated cash flow analysis of the benefits and investments for the organizations' use of ChromeOS devices over a three-year period. ROI is the ratio of the net present value (NPV) and the discounted investment. The payback period is the point at which cumulative benefits equal the initial investment.

IDC bases the payback period and ROI calculations on a number of assumptions, which are summarized as follows:

- Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and manager productivity savings. For purposes of this analysis, based on the geographic locations of the interviewed organizations, IDC has used assumptions of an average fully loaded salary of \$100,000 per year for IT staff members and an average fully loaded salary of \$70,000 per year for non-IT staff members. IDC assumes that employees work 1,880 hours per year (47 weeks x 40 hours).
- The net present value of the three-year savings is calculated by subtracting the amount that would have been realized by investing the original sum in an instrument yielding a 12% return to allow for the missed opportunity cost. This accounts for both the assumed cost of money and the assumed rate of return.
- IDC applies a net margin assumption (15%) for most revenue and user productivity gains attributed to interviewed organizations' use of ChromeOS devices, resulting in the net revenue and productivity calculations applied to IDC's model.

Additional Information About Research Conducted and Participant Firmographics

Table 4 provides additional information about the organizations IDC interviewed for this study, including firmographic-level information and information about their use of ChromeOS devices. As shown, interviewed organizations had an enterprise-level profile, with an average of 30,263 employees and annual revenue of \$14.3 billion (medians of 9,000 employees and \$1.0 billion annual revenue, respectively). Study participants provided feedback on experiences with ChromeOS devices not only by the use cases specified in this study (contact center, kiosk and digital signage use, VDI, hybrid/remote workers) but also for a number of geographic locations, including the United States, Australia, India, Netherlands, Singapore, and Spain, and a wide variety of industry verticals, including healthcare (3), real estate (2), technology (2), consumer wellness, construction and engineering, education, financial services, food and beverage, manufacturing, media, pharmaceutical, telecommunications, transportation, travel, and utilities.

TABLE 4

Demographics and Use of ChromeOS Devices by Interviewed Organizations

	Average	Median
Number of employees	30,263	9,000
Number of IT staff	3,395	375
Number of business applications	435	150
Revenue per year	\$14.3B	\$1.0B
Total number of devices for employees	28,763	12,650
Number of ChromeOS devices	1,518	775
Annual growth rate — ChromeOS devices	12%	9%
ChromeOS devices replacing another device	34%	15%
Countries	United States (14), Australia, India, Netherlands, Singapore, and Spain	
Industries	Healthcare (3), real estate (2), technology (2), consumer wellness, construction and engineering, education, financial services, food and beverage, manufacturing, media, pharmaceutical, telecommunications, transportation, travel, and utilities	

n = 19; Source: IDC Business Value Research, June 2022

Meanwhile, IDC's web survey measured the experiences of 379 organizations with ChromeOS devices. The survey sample included the following characteristics:

- **Region:** United States (20%), United Kingdom (13%), France (13%), Germany (13%), North Europe (27%), and Japan (13%)
- **Industry:** Banking (14.0%), construction (10.0%), retail (9.8%), process manufacturing (9.2%), healthcare (7.4%), and professional services (7.1%)—the most frequent participants by industry vertical in the web survey
- **Company size:** More than 20,000 employees (13%), 5,000–19,999 employees (39%), 1,000–4,999 employees (35%), and 250–999 employees (13%)
- **Use case:** 56% of survey organizations using ChromeOS devices for their hybrid/remote workforces; 54% of survey respondents using ChromeOS devices for their contact center operations; 39% of survey respondents using ChromeOS devices for running VDI applications and workloads; 22% of survey respondents using ChromeOS devices for kiosk and digital signage purposes

Appendix 2: Additional Customer Quotes

This appendix includes other select quotes from interviews conducted with organizations using ChromeOS devices that were not used in the main body of this study:

Cost allowing for device expansion and lightweight devices, food and beverage, Spain, hybrid/remote:

“The cost makes ChromeOS devices accessible compared to [other] devices. Procurement is easy, and the licensing costs aren’t bad. The infrastructure allows us to use tablets, which are more accessible and lighter than other devices.”

Cost, cloud first, and need for supporting more remote workers, VP of IT, media, United States, remote/hybrid:

“Pricing, the relatively cheaper cost was important to us in choosing ChromeOS devices. Our IT is moving to a cloud-first strategy; we have most of our apps in the cloud, and employees are accessing them through a browser. Next, the COVID-19 event led to us having more remote workers. We’ve always had an above-average number of remote workers. So having a remote device that’s easy to manage, inexpensive, and secure is important.”

Affordable but provides sufficient performance, CTO, manufacturing, United States, hybrid/remote:

“Chromebooks are affordable notebooks that are at the minimum end of the range of specifications that can still run Windows easily. They run the cloud apps and the easy stuff like email. It does the work we need at lower cost and allows us to make use of older notebooks, avoiding purchase of new hardware.”

Strong VDI access without security-related concerns, IT director, education, Singapore, VDI:

“We were trying to cut some costs, so we saw this opportunity with ChromeOS devices for our employees to get a Chromebook and have everything VDI and they don’t have to worry about security, antivirus, and all that stuff.”

Licensing cost optimization and ease of deployment, manufacturing, United States, VDI:

“Licensing for [other devices] is getting more and more expensive. We’re looking toward a comprehensive migration to Google Workspace, and cost is the big driver. Security and ease of use/deployment/management, all compared against [other devices]. We had a specific use case two years ago, needing to roll out a solution for WFH, and it took us less than three months with Chromebooks. We couldn’t have accomplished that with [other devices].”

Important component of growing business, technology head, consumer products company, EMEA/worldwide, kiosk:

“We have many stores that needed investment—we want to grow the business five times through new customer acquisition, investment in the business, and new technology. We’re reengineering our retail stores to be more self-sufficient, bringing in new tech to manage point of sale and kiosk, freeing the staff to handle nutritional advice and other services. ChromeOS devices make the stores more interactive and allow customers to make purchases and schedule appointments. We have loyal retail customers and a few digital customers; we want to move into a blended model, so the tech piece is also being used as a support to grow our omnichannel.”

Enables communication capabilities core to mission, CIO, healthcare organization, Australia, kiosk:

“We introduced a new function with Chromebooks that was because of COVID-19 as our facilities were locked. If a patient was there, they couldn’t have visitors, so we needed some way for people to connect. Before, you’d expect people to do that themselves, but given the fact that we had to lock our doors, we felt that we had to provide some avenue for people to do this. It was just the right thing to do.”

Increased comfort with ChromeOS as IT foundation, healthcare, United States, contact center:

“We’re finding out that onboarding, training, and the shift from legacy software are all smooth with ChromeOS devices. We’re looking what’s out in the market and where the need is ... but it’s forward looking in terms of speed, simplicity, and security.”

Lower cost and efficiencies supporting rapid business growth/expansion, head of IT, technology, United States, VDI:

“The most significant benefit of ChromeOS devices is supporting the workforce through high growth. This means we need fast deployment, which Chrome offers, at low cost. We used to have to invest \$2,000 for a laptop, monitor, and the works; we’ve got that down to \$400–800 with Chromebooks to run all your operations. We’ve thought about doing BYOD, especially for our workforce outside the United States. They can source a Chromebook locally, get our credentials, and get their applications running.”

Same user experience for all employees accessing VDI, manufacturing, United States, VDI:

“With ChromeOS devices, we have the ability to sync the desktop to the cloud; wherever employees log in, they have the same user experience. On security, we’ve seen the benefits: we had cybersecurity events recently, and ChromeOS devices weren’t impacted.”

Functional and secure, which help enable business, CIO, construction and engineering company, United States, kiosk:

“Chromebooks are lightweight and cost effective for use as employee-facing kiosks. They have a touchscreen and a keyboard. If they’re stolen, we can replace them quickly without losing data or company assets We’ve been able to develop targeted solutions with digital signage and kiosking to provide application interfaces on the manufacturing floor with dashboards and scans. It’s been a huge benefit to business opportunity; we’ve been able to scale up capacity because of it.”

Security and cost, VP, technology and innovation, transportation, United States, kiosk:

“The attraction of ChromeOS devices is not a lot has to be touched. We also like the security aspect of it because they are not attacked as much or phished or really exposed to anything, so it’s secure for the application we have on hand. The price point’s great too.”

Ease of use creating consistency, CTO architecture, financial services, United States, contact center:

“ChromeOS devices help us be consistent. We can have one development staff handle everything, use automation, and push out code in cases where we couldn’t simply use a web app. We benefit from ease of use and ease of management of the platform.”

Right device for conditions required for kiosk/digital signage use, VP, technology and innovation, transportation, United States, kiosk:

“We needed to find hardware that could really withstand the elements to have the possibility of being outdoors and not in air conditioned because we are in Texas, and that is the most difficult part. We found the ChromeOS devices really fit our needs because a traditional PC form factor runs pretty hot, and you introduce it outdoors, and it’s just a whole other mess. So that was really important to us.”

Ability to easily provide to customers without security concerns, IT manager, telecommunications company, India, kiosk:

“Performance-wise, ChromeOS devices are better than normal laptops because the laptops have multiple applications that run in the background and many security-related issues are there, so we cannot open to all the people. Whereas with Chromebooks, you can give it to any customer to experience it.”

Good device for digital signage, technology head, consumer products company, EMEA/worldwide, kiosk:

“We don’t have a lot of ChromeOS devices as digital signage yet, but we’ll have more in our new stores for more dynamic digital displays. What ChromeOS devices, including Chromebooks, Chromebases, and ChromeOS tablets, offer is visual attraction: it looks cool, helps attract and engage customers, helps sales, raises the brand.”

Intangible benefits and customer/employee perception, technology head, consumer products company, EMEA/worldwide, kiosk:

“ChromeOS devices also provide intangible benefits such as brand appreciation in the kiosk; the image of an omni-channel reflecting modernization of brand. We see positive feedback on social media. It helps with the evolution of the business from multiple perspectives. Also, employees see it as an investment in them.”

Security and agility for contact center operations, healthcare, United States, contact center:

“We chose ChromeOS devices for their security features, including ransomware protection and proactive security updates, as well as the customer experience. We want our contact centers to be cloud first and agile. Up to a certain point, everybody says the same things to sell their solution, so I look for real-world evidence of success, and I look at cost.”

Common device for all agents, pharmaceutical, United States, contact center:

“We wanted to provide our agents with a company-owned device, which we have control over as opposed to using their own devices. So we decided to push Chromebooks due to cost and control. Then the pandemic hit, and all our contact center agents that used to be in the office had no remote access, so we essentially provided them all with Chromebooks as well. Now, every call center agent, whether they’re an employee or from the outside firm, all use the same Chromebook.”

Good device for expanding contact center team, IT director, real estate, United States, contact center:

“Most of our contact center agents are remote, even before COVID-19, and we have 100 offices using these ChromeOS devices in different states. We were in a vast growth mode, and needed to set up offices very quickly without having to configure a whole network and VPN and all that, we could just send out the ChromeOS devices.”

Right device for distributed employee base, VP of IT, real estate, United States, VDI:

“We had a distributed training base we wanted to provide tablets to for training in the field. The application for the training ran on ChromeOS on the tablet. There was another application we were able to leverage because they already had these ChromeOS devices.”

Better access because of enhanced/efficient security, IT director, education, Singapore, VDI:

“With better access to VDI applications, our employees are able to perform their tasks much faster with ChromeOS devices compared to previously, where they had several layers of security protocols to go through before getting to where they need to be and perform the task.”

Foundation for virtualization, head of IT, technology, United States, VDI:

“Everywhere we’re deploying applications to support the business, we look to virtualization first. That may change as we continue developing and scaling. ChromeOS devices are a driving force behind increased access because it’s so easy.”

Ability to provide completely secure access, CTO, travel, United States, hybrid/remote:

“We were going to continue with allowing our employees to have their own laptops, but the ability to actually lock the device down and have full secure access into our environment with ChromeOS devices was one of the big things for us.”

Encourages collaboration and enables faster project delivery, manufacturing, United States, hybrid/remote:

“We can collaborate faster with ChromeOS devices, which matters because so many projects we do require a lot of collaboration—the design of an app, for example, has our people working with the client’s people. Chrome allows us to execute the project faster than we were able to do previously, maybe by 10% A lot of the programming is done in-house and then deployed in the field, and that process is faster and less expensive.”

Helps focus on growth objectives, VP of IT, media, United States, hybrid/remote:

“Our digital product team is using a Google-based ecosystem, so Chromebooks were a natural fit. During COVID-19, they were one of the team to benefit most in terms of new business opportunities. The ChromeOS devices, their ease of provisioning and deployment and the remote management features, gave them the ability to focus on the challenges of achieving their growth objectives instead of having to worry about equipment issues. That team realized 1–2% higher revenue.”

Appendix 3: Supplemental Data

The tables in this appendix provide an accessible version of the data for the complex figures included in this Business Value Paper. By clicking “Return to original figure” below each table, you can quickly get back to the corresponding data figure.

DATA FROM FIGURE 6

Initial Device Costs

(Cost per device)

	Other devices	With ChromeOS
Replaced devices	\$1,168	\$413 (63% less expensive)
Weighted average (net new and replaced)	\$669	\$413 (38% less expensive)

n = 19; Source: IDC Business Value Research, June 2022

[Return to original figure](#)

DATA FROM FIGURE 7

Device Costs over Three Years

(Cost per device)

	Cost per device	Cost for device replacement	Cost for device management software	Cost for device training	Cost for device deployment
Other devices (\$1,265 per device)	\$669	\$369	\$131	\$96	\$0
With ChromeOS (\$802 per device, 37% lower)	\$413	\$132	\$124	\$125	\$7

n = 19; Source: IDC Business Value Research, June 2022

[Return to original figure](#)

DATA FROM FIGURE 8

Total Three-Year Cost of Operations per Device

(Cost per device over three years)

	Device costs	Staff time costs	Cost of lost productivity
Other devices (\$4,023 per device)	\$1,265	\$1,664	\$1,095
With ChromeOS (\$2,256 per device, 44% lower cost)	\$802 (37% savings)	\$1,092 (34% savings)	\$362 (67% savings)

n = 19, Survey n = 379; Source: IDC Business Value Research, June 2022

[Return to original figure](#)

Note: All numbers in this document may not be exact due to rounding.

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