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Chromebooks in Business: No Longer Just a Kids' Laptop

Chromebooks have long been thought of as just laptops for schools and consumers. Here's why businesses should take a hard look at them too.

By Kurt Marko

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About
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KURT MARKO is an IT industry analyst, consultant and regular contributor to a number of technology publications, pursuing his passion for communications after a varied career that has spanned virtually the entire high-tech food chain from chips to systems. Upon graduating from Stanford University with bachelor's and master's degrees in electrical engineering, Marko spent several years as a semiconductor device physicist, doing process design, modeling and testing. He then joined AT&T Bell Laboratories as a memory chip designer and CAD and simulation developer. Moving to Hewlett-Packard, he started in the laser printer R&D lab doing electrophotography development, for which he earned a patent, but his love of computers eventually led him to join HP's nascent technical IT group. Marko spent 15 years as an IT engineer and was a lead architect for several enterprisewide infrastructure projects at HP, including the Windows domain infrastructure, remote access service, Exchange email infrastructure and managed web services.

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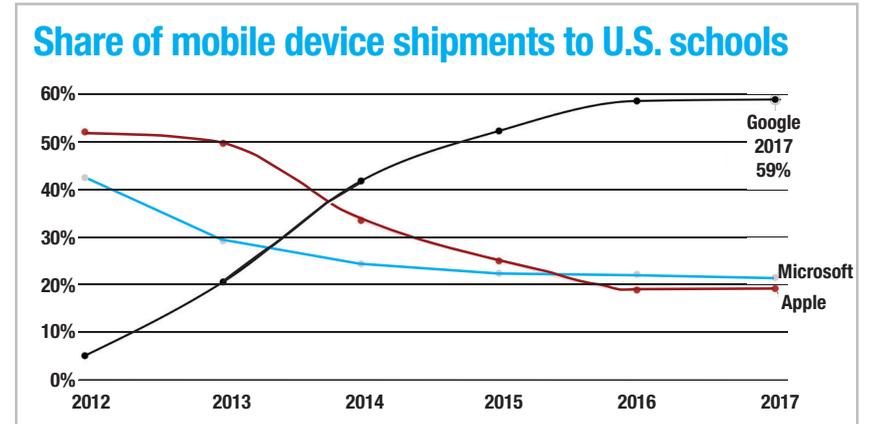@krmarko

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Chromebooks in Business: No Longer Just a Kids' Laptop

Chromebooks for much of their existence have been ideal laptops for schools and consumers on a tight budget, but their lack of enterprise features made them a poor choice for businesses. However, thanks to increasingly more powerful devices and a significantly upgraded productivity platform, Chromebooks are primed to give many businesses what they need, but with a better price and security than other laptop options.

We're nearly nine years into Google's experiment with a Windows alternative, Chrome OS and its embodiment in various Chromebooks and Chromeboxes. In that time, the line between laptop PCs and tablets has been blurred into irrelevance as Windows two-in-ones like Microsoft's Surface have gained touchscreens and iPad Pros have evolved into productivity powerhouses. The Chromebook has not sat idly by during those years as its hardware has become vastly more capable and Chrome OS has gained support for both touchscreens and Android applications. What those changes mean for Chromebooks is that devices that started out as crippled PC alternatives confined to Web browsing are now legitimate business platforms for a growing number of tasks.

Those early Chromebooks came with inherent limitations, but it was those weaknesses – namely cheap hardware and the inability to run Windows applications – that initially appealed to schools, as they became strengths by giving educators a cost-effective device with significantly more control, making it unlikely to be hijacked by students into less productive pursuits. Indeed, Chrome OS' feature frugality created a much more secure platform than Windows with its limited attack surface and inherent malware resistance.

Share of mobile device shipments to U.S. schools

Source: Futuresource Consulting; Get the data; Created with Datawrapper

The Chromebook's success in education, where it now dominates with about 60 percent of the market, seemed likely to relegate it to permanent low-rent status as the device for those who can't afford a "real" PC. It's a perception that Google has actively fought by entering the hardware business and releasing increasingly powerful devices under the Pixel/Pixelbook label. The company simultaneously has diligently worked to narrow the feature gap of its signature applications by significantly upgrading its G Suite productivity platform to include virtually all of the features that those in a typical Microsoft Office shop actually use.

This past August, Google and Dell unveiled the first Chromebooks made for business, Dell's Latitude 5300 2-in-1 Chromebook Enterprise and

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the Latitude 5400 Chromebook Enterprise, both loaded with Google's Chrome OS Enterprise. The two companies worked together for more than a year to ensure that the devices met the expectations of IT groups.

Google previously provided Chrome OS Enterprise for purchase as a separate offering, but Dell is the first OEM to bundle it on enterprise notebooks. Introduced by Google in 2017, Chrome OS Enterprise provides added security and management features.

Google said it was working on enterprise Chromebooks with other major OEMs, presumably HP, Lenovo, ASUS and Acer, among others.

Nevertheless, old perceptions die hard, and the number of Chrome devices in use remains only a tiny fraction of the total PC population. It's difficult to get a precise estimate of annual Chrome device sales, since only IDC (but not Gartner) includes Chromebooks in its definition of "PC" and it doesn't publicly break out shipments by OS, only vendor. However, one estimate has Chromebooks accounting for almost 9 million devices in 2018, which would be only about 4 percent of total PC shipments for the year. However, the same numbers show Chromebook sales growing about 14 percent annually over the next five years, a healthy contrast to stagnant Windows and Mac markets.
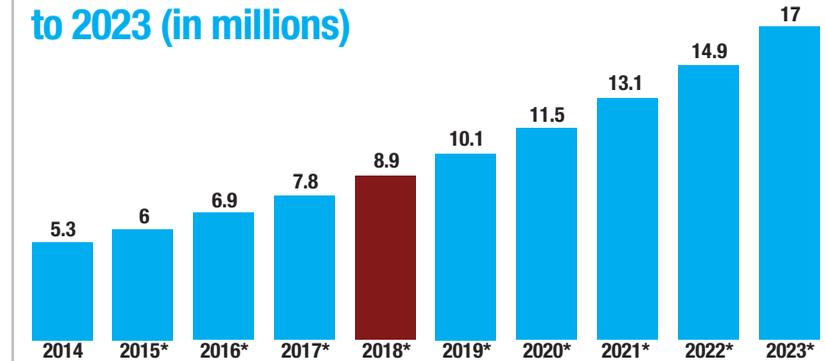
The question for business and IT leaders and their partners is whether their organization should be one of those jumping on the Chromebook train. In this report, we will demonstrate why Chromebooks are indeed safe for business and how they could save companies a significant amount of cash and IT a lot of security and support headaches.

The Business Pivot: PC-Like Capabilities Without the Security Headaches

Chromebooks in business are like those solid, dependable employees in every organization who quietly go about their work without calling attention to themselves. That's a charitable way of saying that you there isn't much hype following Chromebooks and the little publicity they generate is either the result of new consumer devices hitting the shelves or Google's marketing hyping their advantages. Indeed, outside of Google, there aren't many Chromebook cheerleaders in big business. However, the company has sponsored several "independent" reports and surveys about Chrome enterprise usage with some useful data. Although such sponsored studies must be read skeptically because they are generally crafted to favorably portray a particular topic or point of

view, these do accurately reflect the platform's appeal to business.

A Forrester report on the Total Economic Impact of Chrome OS with G Suite includes data from a survey of 34 companies using Chrome OS with G Suite. Two questions, one on the impetus to consider migrating to Chromebooks and the other on the benefits achieved after doing so, are particularly revealing. The primary reasons for making the switch are goals likely shared by every organization, namely to improve:

- Usability and the employee experience
- IT productivity
- Speed and user productivity

Ironically, things that we consider to be among the strongest attributes of Chromebooks, including better security, stability and lower cost (both TCO

Chromebook unit shipments worldwide from 2014 to 2023 (in millions)

2014: 5.3, 2015*: 6, 2016*: 6.9, 2017*: 7.8, 2018*: 8.9, 2019*: 10.1, 2020*: 11.5, 2021*: 13.1, 2022*: 14.9, 2023*: 17

Source: Statista
*estimates

and up-front), were down on the list of responses.

However, *after* organizations had experience running a Chromebook environment, these benefits became apparent – when the same group of companies was asked about the beneficial consequences of their switch to Chrome devices, they highlighted:
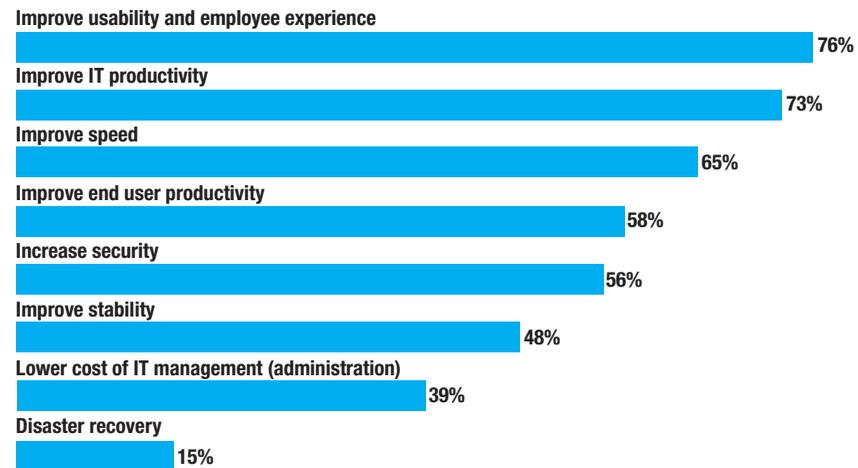
- Faster problem troubleshooting and resolution
- Improved security through better operational visibility, fewer data breaches and a reduced threat surface
- Operational efficiencies such as easier deployments, less time spent on software updates and reduced costs of overall device management

The Forrester survey captures the essence of the business case for Chromebooks, but let's dive into some details about what makes the platform a more efficient, secure and cost-effective option.

Technical Foundation: Lean Platform, Enterprise Management Features a Winning Combination

The days of Chromebooks being marginalized as mere toy appliances that only run a browser are ancient history, but old stereotypes are hard

What drove your organization to move to Chrome devices?

Improve usability and employee experience	76%
Improve IT productivity	73%
Improve speed	65%
Improve end user productivity	58%
Increase security	56%
Improve stability	48%
Lower cost of IT management (administration)	39%
Disaster recovery	15%

Base: 66 Google Chrome OS with G-Suite users
Source: A commissioned study conducted by Forrester Consulting on behalf of Google, February 2018

to shake. Thus, many business users might still harbor the misconception that Chrome devices are utterly inadequate for "real" work. The experiences of millions of employees, teachers and students belie this notion. Full disclosure: For the past five years, this author has done virtually all of his writing, research, editing, charting and correspondence on either a Chromebook or iPad, and my experience is hardly unique.

Chromebooks benefit from the time-tested Linux kernel and taking a blank-sheet approach to what an OS should do in the era of Web apps and cloud services. The vision and implementation

of Chrome OS are largely unchanged from those Google outlined when it first announced the project more than a decade ago:

"Speed, simplicity and security are the key aspects of Google Chrome OS. We're designing the OS to be fast and lightweight, to start up and get you onto the web in a few seconds. The user interface is minimal to stay out of your way, and most of the user experience takes place on the web. And as we did for the Google Chrome browser, we are going back to the basics and completely redesigning the underlying security architecture of the OS so that users don't have to deal with viruses, malware and security updates. It should just work."

Google's focused design philosophy, which the technically minded can see explained in extreme detail on the Chromium Projects (the open-source version of Chrome OS) website, underlies the speed, security, stability and user experience Chromebook users enjoy.

Fundamental to Chromebooks is the notion that they will almost always be connected, thus their dependence on a multitude of cloud services for applications, data and device management.

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Although Chromebooks have local file systems, these don't store a user's profile or operating state, but are rather used for the OS, application and document caching (for offline work), and convenient storage of personal files. As inherently networked devices, Chromebooks are designed to be remotely managed and automatically updated with no user intervention. The stable release channel of Chrome OS is updated every six weeks (every week or two for the beta channel), while Google pushes out security patches every two to three weeks.

The stateless design of Chrome OS is the primary reason Chromebooks can be deployed in minutes. Indeed, users can reset their device to factory defaults, re-download the latest version of Chrome (whether it be from the stable, beta, dev or canary channel), log in to their Google account, and have their entire desktop and user profile restored while they grab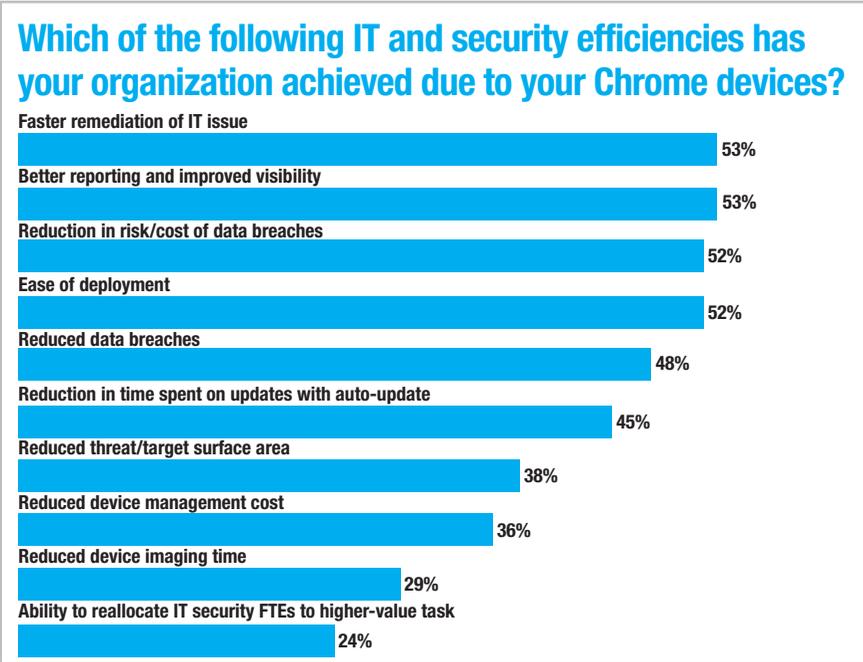 a cup of coffee. The ability to rapidly restore Chrome devices to a known good configuration also makes them much easier to troubleshoot and fix. Plus, the stateless design means that users get a consistent interface every time they log in, regardless of the device, since their session state is automatically synced to the cloud.

Web apps were the initial, and still primary, delivery platform for Chromebook software. Applications such as G Suite, Google's Office substitute, along with thousands of other titles in the Chrome Web Store can fill most needs. No, you won't find Photoshop, but browser-based apps like Pixlr and Gimp provide reasonable facsimiles that include many advanced features. There are similar alternatives for many other software categories.

Nevertheless, Google realized that sometimes imitations won't do, so for these users it added support for Android applications such as Word, Outlook, Photoshop Express and Acrobat. Android apps aren't supported on every Chromebook, but most of the newer models, particularly those with touchscreens, will work (see here for the latest list). For categories like CAD, legacy business or any other applications where a user absolutely, positively needs to run a Windows or Mac application on Chrome OS, the solution is app streaming or VDI, in which the underlying code runs remotely on an x86 server and is displayed using a Chrome web app like VMware Horizon, Citrix Workspace or Amazon Workspaces.

Since Chromebooks use a lean OS that is highly reliant on cloud services and apps, they can get by with little local storage and very efficient local processors. These result in hardware that's thin, light and cheaper while providing all-day battery life. For example, high-end Chromebooks such as the Acer 13, HP x2 and Google Pixelbook run $600-$1,000 with a seventh- or eighth-

Which of the following IT and security efficiencies has your organization achieved due to your Chrome devices?

Faster remediation of IT issue
53%

Better reporting and improved visibility
53%

Reduction in risk/cost of data breaches
52%

Ease of deployment
52%

Reduced data breaches
48%

Reduction in time spent on updates with auto-update
45%

Reduced threat/target surface area
38%

Reduced device management cost
36%

Reduced device imaging time
29%

Ability to reallocate IT security FTEs to higher-value task
24%

Base: 66 Google G-Suite users with Chrome OS users
Source: A commissioned study conducted by Forrester Consulting on behalf of Google, February 2018

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generation Intel mobile processor, QHD display and 64GB SSD while delivering 10 hours or more of battery life. Lesser-spec'd models can be had for under $400, which means that users can pair a Chromebook with VDI and have the equivalent of a high-end workstation for under $1,000.

Chrome Management Features

Google makes more than 200 device management policies available via its Chrome Enterprise license. Policies fall into several categories:

USER-LEVEL POLICIES with more than 100 controls that mirror those available for PC environments using Windows Group Policy.
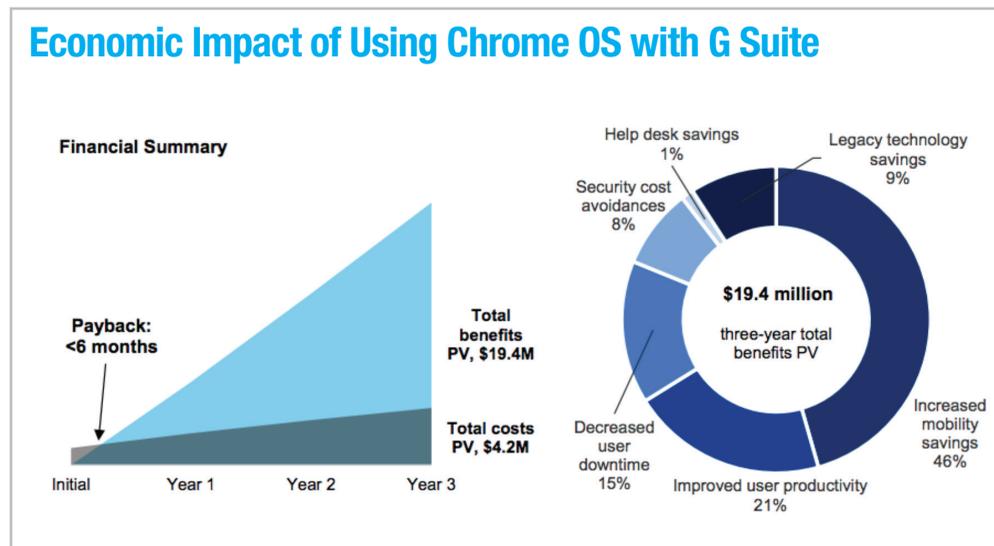
DEVICE-LEVEL POLICIES such as user sign-in restrictions, guest access, auto-update settings and metric reporting.

APP AND EXTENSION CONTROLS such as force installing an app and pinning it to the Chrome taskbar or setting the configuration for one or more apps.

FLEET MANAGEMENT such as the ability to disable, re-enable, deprovision and wipe a device.

PRINTER DEPLOYMENT AND CONFIGURATION including the ability to control access to features like color printing.

ACCESS AND NETWORK MANAGEMENT such as adding and configuring Wi-Fi or Ethernet networks and VPNs and the ability to force automatic connections to managed networks.

Economic Impact of Using Chrome OS with G Suite

Source: Forrester

Chrome devices using x86 processors can also be connected to an Active Directory server, allowing devices and users to be managed by familiar Windows administration tools. In addition, Chrome OS supports other popular third-party management systems including VMware Workspace ONE, Cisco Meraki, Citrix Xenmobile, IBM MaaS360 and ManageEngine MDM Plus.

Financial Benefits

The combination of a lean, secure, remotely manageable OS, cloud services to deliver applications and user profiles paired with lower-cost hardware makes Chromebooks a much less expensive environment to deploy and operate than alternatives like Windows and MacOS. Quantifying TCO is always tricky, since the results are easily manipulated by one's assumptions. Thus, TCO estimates from vendor-sponsored research should always be skeptically examined, since their motivations and inputs might not be completely objective.

With those caveats, a thorough analysis by Forrester for Google shows that by deploying Chromebooks and G Suite, organizations can reap the following benefits:

REDUCE EMPLOYEE DOWNTIME by 30 minutes per week, which would save a

50,000-employee organization with 7,000 Chrome users $2.92 million in lost productivity over three years, or $140 per employee per year.

REDUCE ENDPOINT SECURITY ISSUES by 20 percent, saving the same organization $656,000 per year.

INCREASE HELP DESK EFFICIENCY by almost 16 percent as measured by reduced call volumes and response times, saving $83,000 per year.

SIGNIFICANTLY REDUCE THE TIME SPENT MANAGING DEVICES, which Forrester estimates is about 50 hours per week with traditional environments for the same-sized organization.

In toto, Forrester estimates that with an average cost per user of $170 per year for G Suite and the Chrome Enterprise Management licenses, the payback time for a positive ROI is less than six months.

Business Use Cases

The Forrester cost-benefit analysis uses the most common business scenario for Chromebooks: to outfit office workers and other business professionals with a substitute for traditional Windows laptops. Indeed, this is the audience Google has targeted with its G Suite productivity applications and various collaboration services like Hangouts Chat (individual real-time messaging), Hangouts Meet (video conferencing) and Jamboard (remotely collaborative whiteboards).

Aside from business employees needing a device for productivity software and other administrative tasks, Chromebooks, Chromeboxes and all-in-ones like the Acer Chromebase are well-suited to the following situations:

- Public kiosks used for a limited set of applications such as Internet browsing, airline or hotel check-in, or custom applications.
- Shared devices on manufacturing floors, warehouses, hospitals or other locations where multiple employees will access business applications throughout the day.
- Schools and libraries.

In each of these settings, the tight security and stateless environment of Chrome OS make the device resistant to malware and misuse and allow administrators to quickly restore the device to a known good state in the event of problems.

Partners Call to Action

Chromebooks-as-a-service is the perfect complement to other managed PC services partners might have, since it provides a lower-cost, highly secure option for organizations not firmly embedded in the Microsoft ecosystem. Critical elements of Chromebook management are provided by the Chrome Enterprise service, and although licenses can be purchased through

the Google admin console, the company recommends these be purchased through an authorized partner, particularly for organizations managing more than 50 devices.

Partners should consider the following features in a managed Chromebook service:

- Device procurement, provisioning and lifecycle asset management.
- Chrome Enterprise management incorporating some of the features outlined earlier.
- MDM, since Chrome Enterprise also includes MDM features for both Android and iOS that allow consolidating mobile and laptop device management under a single admin console.
- Google Domain and G Suite provisioning, management and integration.
- Android app management and integration on supported Chromebooks.
- Chrome OS and G Suite help desk and support.

Although the Chromebook market remains small, it is no longer confined to schools, and usage is rapidly spreading to businesses of all sizes. Partners looking for a competitive differentiator in the crowded market for managed endpoint services should consider Chromebooks as an innovative alternative to the status quo.
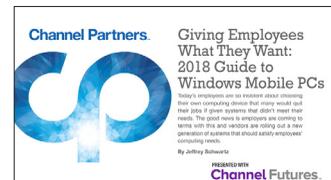
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