Remote-work scenarios and cost constraints have complicated device replacement strategies, leading to underutilization or use beyond the functional life of endpoints. This research provides guidance for I&O leaders to maximize hardware investments and avoid device-related employee disruption.

Overview

Key Findings

- Advances in device reliability and the increased focus on cost optimization due to the COVID-19 pandemic have led to overly aggressive extended device life spans, putting employee experience and productivity at risk.

- Accelerated release of new hardware, software and security capabilities may require infrastructure and operations (I&O) leaders to shorten device life spans due to increased performance requirements.

- The global shift to remote work has left I&O leaders with a wider variety of work settings or user types that have different device requirements, making blanket life cycle policies ineffective.

- Emerging analytics tools use machine learning (ML) and artificial intelligence (AI) to determine optimal device life cycles based on performance, usage demands and employee experience.

Recommendations

I&O leaders focused on digital workplace infrastructure and operations should:

- Optimize device life spans by evaluating reliability and suitability to user tasks.

- Support the needs of workers by adopting multiple life span policies that reflect the spectrum of work styles and usage requirements.

- Refine device replacement schedules and enhance employee experience by utilizing analytics tools to track and remediate performance issues that inhibit productivity.
Introduction

All devices are built with intrinsic obsolescence factors, including limited battery, failing connector ports and dwindling performance capabilities. Therefore, it is essential to have set strategies and policies in place to refresh devices when they start to cross their typical reliability points. The accelerated release of new hardware, software and security capabilities may require I&O leaders to shorten device life spans due to increased performance requirements. At the same time, COVID-19-related cost pressures and improvements in device reliability may compel organizations to keep their devices longer than planned. Knowing exactly when to set these cycles can be challenging, as decommissioning devices too soon wastes residual value, but keeping them too long invites risk of security and operability issues.

To avoid these challenges, I&O leaders must determine the optimal replacement timelines for their devices by weighing the value of devices held longer than their life span estimates against the cost of reparation and lost productivity, while also establishing multiple device replacement policies based on the needs of varying user types and work settings. This research provides estimates and key considerations for I&O leaders to refine device replacement strategies and ensure a maximum return on investment.

Analysis

Optimize Device Life Spans Based on Reliability and Suitability to Task

There are a variety of contributing factors that may lead to device obsolescence, whether it be the wear and tear of daily use, faulty components or an inability to support new applications. To maximize the useful life span of a device and avoid unanticipated failures, I&O leaders must replace their devices before they cross the inflection points of reliability and suitability to task (see Figure 1 and Figure 2).
Figure 1: Life Cycle Based on Likelihood of Device Failure

Life Cycle Based on Likelihood of Device Failure

Source: Gartner (April 2018)
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Reliability continues to improve for most devices due to a shift from mechanical to solid-state parts, allowing for less disruption from device replacement and saved costs from longer life cycles. However, increased mobility has led to other types of failures in batteries, USB connectors, screen hinges and power cables, as devices are living long past their previous life spans.

Stationary PCs, such as desktops, that typically sit in controlled environments suffer little wear and tear, and they often last more than five years with low risk of failure. As for devices that are more portable, such as mobile phones or two-in-one laptops, they take a lot of day-to-day abuse and often fail after only two or three years of service. This has been especially complicated by work from home scenarios, as devices are subject to highly uncontrolled environments that may include additional harmful factors. However, the results of reduced travel and stationary home offices have also lent themselves to greater reliability, and have had an overall positive impact on device life spans.

In either scenario, the goal should be to replace devices before the probability of failures increases significantly (as shown in Figure 1).

Suitability to task has to do with the ability of the device to continue to support employee needs. The goal is to ensure that devices do not begin to hinder productivity or otherwise disrupt work. Suitability to task is less concrete than reliability and involves a number of soft factors. Devices used to age based on
basic component specifications (processor performance, memory or disk capacity), but factors like mobility, battery life, interaction models and security features will impact different users in different ways and determine how well a device fits a particular user type.

This depends on the nature of the job and work style. For those working in a job that doesn't change very often in terms of location or tasks performed, their needs likely will be static over time and, chances are, the machine can remain suitable for many years. However, employees who are in dynamic jobs, with the nature of the work shifting (moving from the desk to the road or shifting from solo to collaborative activities), often find that their old machines do not fit the new realities. For example, the widespread shift to remote work in 2020 led to a dramatic influx of demand for new devices. This was caused by two primary scenarios:

- Many employees worked on in-office desktops, which could not support remote and hybrid working. Therefore, many organizations had to procure a whole new fleet of laptops, two-in-ones or other portable devices.
- The increased need for videoconferencing capabilities proved difficult for many older devices, causing a rapid reduction in device life spans to move to more powerful machines.

Beyond mobility, corporate security needs are changing, and this dictates refreshing hardware to get the latest protection. Nontechnical factors can also play a role in suitability. A company may see the device carried by its employees as a reflection of its corporate image and cycle publicly facing devices more frequently.

**Adopt Multiple Life Span Policies**

Most companies have evolved past a single blanket life cycle policy for all devices and use cases. Instead, they are using a more granular set of policies based on need, device form factor and work setting (see *Optimize End-User Services Through Segmentation of Work Settings*).

Table 1 summarizes Gartner's estimated primary useful life span for various endpoint device categories. The table provides three specific life span approaches to cover various customer endpoint strategies for different types of user profiles:

- Aggressive approaches are typically used by highly mobile employees who have high demands for productivity, response time, and processor and graphic performance, such as those in the C-suite, legal, medical, engineering and financial segments.
- Mainstream approaches support most knowledge workers, such as sales staff, government employees and administrative workers.
- Cost-constrained approaches often apply to organizations or users with static needs who are engaged in relatively stable repetitive tasks or in low-margin businesses, such as call centers, retail businesses and low-cost supply chain businesses.
Table 1 also shows the justifications for device replacement that most commonly determine useful life span estimates. The estimates in this research should be used in life cycle planning for financing decisions.

Table 1: Summary of Estimated Primary Useful Life Spans by Device Category

<table>
<thead>
<tr>
<th>Device Category</th>
<th>Aggressive</th>
<th>Mainstream</th>
<th>Cost-Constrained</th>
<th>Justifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop and All-in-One Computers</td>
<td>4 years</td>
<td>5 years</td>
<td>6 years</td>
<td>While strong on reliability, the ability to support new software is the leading cause of desktop replacement. Some desktop users have static performance needs that allow for longer life spans, while more demanding users such as engineers, developers and creators may require more frequent replacement schedules.</td>
</tr>
<tr>
<td>Notebook, two-in-one and mobile thin-client computers</td>
<td>3 years</td>
<td>4 years</td>
<td>5 years</td>
<td>Greater mobility leads to increased hardware failures in notebook devices, as their life spans are contingent upon the environmental changes they are subject to regularly. Docked laptops will last longer than those that travel and experience more risk.</td>
</tr>
<tr>
<td>Remote-Work Notebook, two-in-one and mobile thin-client computers</td>
<td>4 years</td>
<td>5 years</td>
<td>6 years</td>
<td>Whereas mobile devices such as notebooks and two-in-ones were subject to frequent travel to and from office locations before the pandemic, they have mostly been reduced to single, stationary in-home locations</td>
</tr>
</tbody>
</table>

Source: Gartner (March 2021)

Different users often have different needs, and those needs will change over time at different rates. In addition to extending the life span of devices, the decision to shorten the life cycle can, in most cases, be justified if the performance boost from the new systems can be translated into monetary gain. Therefore, I&O leaders should not adopt a single life span for all use cases, but maintain the balance between device cost and benefit by continuously reevaluating requirements as employee responsibilities and work styles evolve.
To determine whether devices meet current and anticipated business requirements, engage with employee groups or leverage analytics technology to better understand usage patterns and needs as they pertain to:

- Support for current and future OSs deployments
- Security firmware that ensures the device is properly maintained and continues to make greater processing demands
- Ability to properly run enterprise software, including new applications added and recurring software updates and patches
- Ability to connect to all standard enterprise networks and peripherals
- Standing up to daily wear and tear (reliable and durable screen and casing materials) based on usage needs of employees
- Meet the performance and financial expectations of the business

**Utilize Emerging Analytics Tools**

Endpoint analytics are rapidly maturing the ability to monitor hardware and software performance issues and the associated impact on sentiments, as well as to automate fixes to preserve employee experience. These tools provide I&O leaders with real-world feedback on how devices are being used by different types of users, which can optimize hardware investments by informing decisions on machine configurations, and potentially adjusting device life spans based on actual usage patterns. Overall, this enables I&O to objectively understand and remove productivity inhibitors.

However, while analytics might be able to provide life cycle guidance down to the individual machine, financial policies and internal processes will likely limit an organization’s ability to apply customized variable life spans. For now this information will be most useful in assessing patterns of usage and assigning devices to different user segments. Additionally, it can assist with planning processes to adjust future life cycle plans and budgeting.

Each of the enterprise PC manufacturers offer some analytics capabilities and can provide a comprehensive dashboard to see how the devices are being used. These are either offered for an additional cost on certain devices or rolled into PC as a service (PCaaS) deals. Examples include:

- Dell Optimizer
- HP Active Care
- Lenovo Device Intelligence
Alternatively, third-party digital employee experience (DEX) tools offer broader capabilities. Some example tools are:

- 1E Tachyon Platform
- Aterity Digital Experience Management
- Lakeside Software SysTrack
- Microsoft Endpoint Analytics
- Nexthink
- VMware Workspace ONE Intelligence Digital Employee Experience Management

Although this is an emerging market segment, Gartner predicts these tools will be fixtures in proactively anticipating failures and maximizing useful device life spans in the workplace of the future (see Enhance Digital Workplace Operations With Machine Learning and Automation).

Evidence

This research is drawn from over 400 Gartner client inquiries with IT executives and I&O leaders globally on PC life spans and device replacement strategies.

Acronym Key and Glossary Terms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>Enterprise-Grade</td>
<td>Enterprise-grade devices offer increased year-to-year component stability and peripheral support, and work with enterprise-class security and management tools.</td>
</tr>
<tr>
<td>Ruggedized</td>
<td>Ruggedized devices differ from enterprise- or consumer-grade devices in that they have been designed to withstand a number of harsh environmental specifications, often published through government standards. All components — not just the casing, which can easily be protected by an external sleeve — of a ruggedized device are tested for durability.</td>
</tr>
</tbody>
</table>

Document Revision History

Use These Recommended Life Spans to Guide Mobile, PC and Other Device Replacement Strategies - 12 April 2018

Recommended Life Spans for Mobile, PC and Other Endpoint-Computing Devices - 11 September 2015

Recommended by the Authors

Recommended Configurations for Notebooks and Desktop PCs, 2020

Market Guide for Enterprise Desktops and Notebooks
How Best to Equip Home Workers
Optimize End-User Services Through Segmentation of Work Settings
Enhance Digital Workplace Operations With Machine Learning and Automation

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