

# On-Demand Circulation of Software Licenses

## Checking Out Software on Patrons' Own Devices

Ken Irwin and Michael Bomholt

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### ABSTRACT

*The Miami University Libraries (MUL) developed an open-source Software Checkout system to allow patrons to make use of software licenses owned by the library. The system takes advantage of user-based licensing under the Software as a Service (SaaS) license model and vendor-created APIs to easily and legally assign access to users. The service currently supports Adobe Creative Cloud, Final Cut Pro, and Logic Pro software. MUL has successfully used this software for three years. This article describes the expansion of offerings and the increasing use of the service over that time. Built on a model developed by Pixar for managing employee software licenses, the Software Checkout system is believed to be the first of its kind for circulating licenses to library patrons. Both this lending model and the open-source software developed by MUL are available to other libraries. This paper is intended to prompt libraries to take advantage of the legal and technical environment to expand software license sharing to other libraries.*

### INTRODUCTION

Libraries have been in the “checking things out” business for a long time. With the rise of personal computing in the 1980s, libraries not only added computers for public use but also added software to the list of items available for circulation. The recent shift from delivering software on physical media (e.g., compact discs) to purchasing downloadable software from vendors or third-party online platforms such as Google Play or the Apple App Store has made it harder for libraries to lend software. Libraries have continued to offer software access in computer labs, as well as to provide access via somewhat cumbersome remote desktop setups that allow users to control a library computer from another location.

The Miami University Libraries (MUL) have pioneered a method to allow users to check out a software license and use it for a period of time on the patrons' own computer. The service currently supports access to Adobe Creative Cloud and Apple's Final Cut Pro and Logic Pro software. Patrons legally download the software and have use of it until the selected circulation period has expired. The library has a finite number of available licenses and each license may only be assigned to one user at a time; therefore, a license must be currently unassigned in order to be available for checkout. This Software Checkout service expands users' access to specialized software from wherever they are, using their own devices. It improves service to the user and allows the library to maximize the use of the resources it pays for by allowing easy, frequent circulation and return of the licenses.

The service relies on the Software as a Service (SaaS) model of licensing, which allows users to be assigned software licenses for any length of time. Although this could be accomplished by

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Submitted: 25 October 2023. Accepted for Publication: 19 March 2024. Published 17 June 2024.

manually assigning users to licenses, the easy-to-use Software Checkout system is made possible by taking advantage of vendor-provided user management APIs (application programming interfaces) to assign users automatically upon request if a license is available.

This article will describe the system developed to power the Software Checkout service and the results of the first three years of its implementation. The initial version of the service only included Adobe Creative Cloud, and this article will pay particular attention to that software package. The Software Checkout application developed by MUL is open source, and other libraries are invited to implement the system using the same software, which is available for download from GitHub.<sup>1</sup> Although the software is free, it does currently rely on integration with Springshare's LibCal service, which has a cost; and the library, of course, must buy the software licenses it will lend.

Miami University is a midsize public university in rural Ohio. In the Fall 2023 semester, there were approximately 20,000 undergraduate and 2,100 graduate students. Of these, the approximately 1,300 students in the College of Creative Arts may be among the students with the most curricular need for this software, including traditional arts majors as well as students in the Emerging Technology and Design program. Software for checkout through the system is available to all students, regardless of major, and is used by students from every campus division.

## LITERATURE REVIEW

### *History of Library Circulation of Software*

We believe that Miami University Libraries' Software Checkout service is the first of its kind, but it is only the most recent development in a history of library provision of software to users that stretches back at least 40 years. Some key concerns that have emerged over these years of software lending include protecting the physical media from being damaged and addressing the legality of lending software.

Libraries have been circulating software since at least 1984.<sup>2</sup> Descriptions of some early software lending programs focus substantially on the mechanics of lending software on floppy disks, the challenges of multiple incompatible operating systems, concerns over possible damage to the fragile medium, the legality and viability of making copies, as well as the replacement costs of lost or damaged materials.<sup>3</sup> In some cases, organizations sought permission from software publishers prior to lending the software.<sup>4</sup>

By the late 1980s, concerns over software copying became more prominent. The United States Congress took up the matter in the Computer Software Rental Amendments Act of 1990, prohibiting the renting of software without the express permission of the publisher. Against the wishes of the software industry, the law included an exemption that allowed nonprofit libraries to circulate software if a copyright notice was affixed to the packaging.<sup>5</sup> The 1990 law also required a follow-up report to Congress by the Copyright Office of the Library of Congress to determine whether software publishers had been harmed by the library exemption. Although there was some anecdotal evidence of unauthorized copying, the report did not find evidence of harm to the publishers and did not recommend eliminating the exception.<sup>6</sup> The library exemption was originally scheduled to sunset on October 1, 1997,<sup>7</sup> but was made permanent in December 1994, extending libraries' right to lend software to their users.<sup>8</sup>

In 2001, Swanson wrote about the state of software lending by hospital libraries. She reported that the advent of software distribution on CD-ROM and DVD had made the circulating material

more durable and less susceptible to overwriting than the prior magnetic media. She also found a more intense legal environment, in which hospitals had paid “six-figure settlements with software publishers’ watchdog associations” for violating the terms of their software licenses.<sup>9</sup> Also in 2001, librarians at the University of Alabama at Birmingham reported on their use of a Citrix virtual desktop client to provide patrons with remote access to CD-ROM databases, noting that some databases permitted remote access and others did not.<sup>10</sup>

By 2010, libraries had begun exploring the use of Remote Desktop Protocol (RDP) to allow library staff to connect to office computers from home. A white paper by Duckworth, Armour, and Heck describes the system in place at Augusta State University for providing a secure connection to library staff to work from home, though they noted that the computationally intensive remote desktop system can be slow. They did not address how the system might be employed to offer service to library patrons.<sup>11</sup>

Outside the library, universities had begun using remote-desktop laboratories and data centers to deliver specialized computer software to students for remote-learning purposes. As Duckworth forewarned, the slowness of such systems was of concern, as evidenced by a pair of studies examining “quality of experience” (QofE) for users of those systems.<sup>12</sup>

In 2013, the Kansas City Public Library (KCPL) announced plans to allow library patrons to use a remote desktop system to access Photoshop and other Adobe Creative Suite software via remote desktop.<sup>13</sup> They hired a programmer to write a customized scheduling system that would manage access, allowing one user per copy of the software at a time to comply with the terms of the license. They solved the problem of slowness by taking advantage of Kansas City’s then-new gigabit-speed fiber network, capable of much faster transmission than previous networks. Although this exciting advancement was announced in *Library Journal* at the time, the project never came to fruition—not due to technical obstacles, but administrative and legal ones: the library felt they needed explicit permission from Adobe to go forward with the plan, and no deal was ever reached. The project was eventually dropped.<sup>14</sup> The need to work within the constraints of what is allowed is an ongoing challenge, but the decade since KCPL’s project has substantially changed what is explicitly allowed.

### ***Software as a Service***

The KCPL project was ahead of its time, and the software licenses of the day were unprepared to consider short-term, remote access to software by multiple users. Change was on the horizon, however, with the advent of Software as a Service licenses (SaaS). SaaS refers to “licensing [that] offers software using a subscription model whereas perpetual licensing involves a one-time payment for a perpetual use license and optional additional payments for future upgrades.”<sup>15</sup>

The 2010s saw the rise to prominence of SaaS versions of common desktop software. Microsoft shifted its desktop-based Office Suite to the cloud-hosted version Office 365, available for an annual subscription fee. Adobe ceased publication of boxed versions of its Creative Suite software in 2013, moving to online-only delivery through Adobe Creative Cloud subscriptions.<sup>16</sup> While Office 365 lets users create and edit documents online, most of the more computationally intensive Creative Cloud software is downloaded and installed as desktop software, but users have the option to save documents in the cloud; two exceptions are Lightroom and Acrobat, which have online instances as well as downloadable desktop applications. One wonders if Adobe’s impending shift to cloud-based software management was behind their reluctance to authorize KCPL’s remote desktop-based offerings of Adobe software.

### ***Options for Increasing Access to Specialized Software***

The Software Checkout service at the Miami University Libraries was designed to provide users with access to software that they do not own or have licenses to, initially Adobe Creative Cloud software. The simplest, and probably oldest, solution would be to provide specialized software in a computer lab in the library; MUL has offered Adobe software in computer labs since at least 2007. Other than the KCPL example, no mention of using remote desktop protocols to give patrons access to computing applications appears in the library literature until the COVID pandemic era, which brought its own unique demands for remote service.<sup>17</sup> However, MUL made the statistical packages SAS and Stata available through remote desktop solutions starting around 2017. When COVID restrictions kept most users away from campus during 2020–2021, MUL expanded its remote desktop options to include access to library lab computers that offered Adobe Photoshop (among other packages) using the Remote Lab software developed by the School of Information Studies at Syracuse University.<sup>18</sup> A key difference between the MUL COVID-era remote access and the system planned by the Kansas City Public Library was that KCPL's system had a devoted bank of remote-use-only computers, where Miami's remote solution used regular patron-accessible computer lab computers that were remotely accessible only when an in-person user was not present.

### ***Related Work***

The direct inspiration for MUL's development of the Software Checkout system came not from within the library space, but from the computer animation studio Pixar. At the 2019 Mac DevOps conference in Vancouver, Canada, Dan Berman gave a presentation about Pixar's management of Adobe licenses for their employees.<sup>19</sup> At the time of the presentation, Adobe had recently moved from device-based licensing to user-based licensing, which required Pixar to adapt their IT processes to the new licensing model. Under the old model, a software package was installed on a computer and usable only on that computer. Under the new model, the software was assigned to a user rather than to a specific device. Access to software was managed by assigning designated users to a permissions group in the Adobe Admin Console website. Pixar built a workflow whereby a user would submit an electronic request for access to an Adobe application, and an IT manager decided whether the employee needed access to the software. If so, they launched an automated process that added the employee to the permission group for that software. The software itself was preloaded on employees' computers but was only functional when the user was in the relevant permissions group. Once assigned to the group, a user would be able to start using the software in a matter of seconds, as soon as their user-based license was activated at Adobe.

There are a great many applications in the Adobe Creative Cloud suite (e.g., Photoshop, Illustrator, InDesign, etc.), and they may be licensed individually or in an "All Apps" bundle. Berman discussed Pixar's decision to buy and assign individual product licenses, noting that most users needed only a few applications at a time, making the All Apps bundle unnecessarily expensive for their needs. The key to reducing how many applications a user was entitled to at once (and thus reducing costs) was to revoke individual licenses that went unused after 30 days of inactivity. Berman referred to this as "silent expiration," as users were not notified of the revocation so as not to induce users to request the license again until it was actually needed.<sup>20</sup>

### ***Legal Considerations***

The idea of lending out software licenses sounds too good to be legal, but it is based soundly in the rules created by software companies themselves. By making short-term assignments of users to permission groups, organizations can maximize the value from each license purchased for use.

Berman addressed this tension in his talk, saying “We’re totally within our [license agreement] to be able to do all this automated management but ... [Adobe] love[s] it when people deploy licenses willy-nilly and just give everyone who asks for Photoshop [a license].... [O]ur [Adobe] tech reps liked [the new system]; I’m not sure our [Adobe] sales people liked it.”<sup>21</sup> The Software Checkout system makes efficient use of library resources by using systems provided by the vendors. Libraries can take advantage of this technical and legal environment to better support our users.

### *User Experience*

Under user-based licensing, there is increased flexibility in where and how a user can do work. Because the license is assigned to the user and not the device, the user can move between workstations and operating systems as needed, and the experience can be as platform agnostic as the vendor allows. Adobe Creative Cloud currently supports versions of their software for Windows, macOS, iOS, and Android.<sup>22</sup> Under the user-based license model, patrons can use any or all of these platforms.

Content created using Adobe Creative Cloud can be saved locally on the user’s device or in Adobe’s cloud storage. As long as the content saved remains below the amount allowed in free accounts (2GB as of August 2023), content will remain hosted by Adobe even after the license is unassigned from the user; there is a 30-day grace period during which content exceeding 2GB will be hosted, but content may be lost if a larger volume of data is stored there for longer than that grace period.<sup>23</sup>

## **METHODOLOGY**

### *Workflow*

Pixar’s model served as a basis for the Miami University Libraries. It demonstrated the elements the Libraries would need to implement a checkout system for Adobe software. The particulars vary, but the pattern remains the same:

- Organization establishes a pool of licenses for checkout.
- User requests software.
- Automated workflow assigns a license to the user.
- Software is returned/checked in by revoking the user’s license.

### *License Pool*

At the time MUL began developing the Software Checkout system, the user-based model for Adobe software licenses was already in use on campus to manage employee access to Creative Cloud software. The Adobe Admin console allows for any number of permissions groups, each of which can have a different set of permissions, whether it is for a single title (e.g., Photoshop) or for an All Apps bundle. The Libraries had purchased a number of licenses for individual software packages, and employees who needed the software were added and removed from the relevant permission groups manually through the Adobe Admin console.

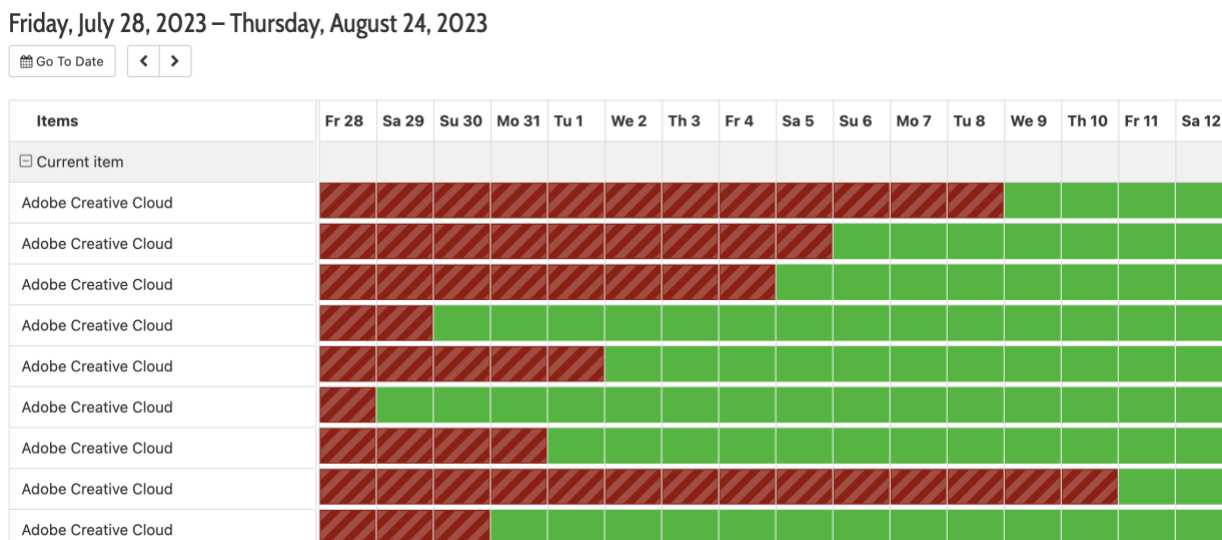
### *User Request*

The Libraries’ needs for user requests substantially differ from Pixar’s. Pixar was explicitly in the gatekeeping business—they were interested in limiting unnecessary use of the licenses by their employees to keep costs down, while also wishing to ensure employees had access to the software they needed.<sup>24</sup> The Libraries are not in the business of deciding who should have access to the software, so there was no need for a gatekeeping function. Rather, the priority for the MUL was to grant access to users as seamlessly as possible with no human mediation of the process. If the user

requests access to the software at 3 a.m., they should have access to it as soon as possible (under our current implementation, it usually occurs within about 10 minutes).

The Libraries’ solution to requesting and managing access is to use Springshare’s LibCal software as the front-end through which users can reserve access to a license. LibCal was already in use in the Libraries for reserving study rooms and Makerspace equipment and for making appointments with librarians. Thus, LibCal was already familiar to many users, already understood by the Systems librarians, and already integrated with the university’s authentication system. LibCal’s equipment reservation system had the necessary functionality and API to support the Software Checkout process, so a new equipment “location” was created to group the items for checkout. A separate “category” was created for each software title; within each category, a “seat” was created in LibCal for each license available. A seat is LibCal’s unit for an individual reservable item, so LibCal will track five separate seats if there are five separate licenses in a category. Seats do not need to be named (e.g., Photoshop 1, Photoshop 2)—the software just needs to know how many licenses are reserved and how many are available at any given time. For the software location, LibCal is set to show availability in 1-day increments, and to assign Adobe licenses for 14 days at a time, though these settings can be changed for each category of licenses. When a user checks out a license, they can select any time for which a license is available, starting “today” or on a future date in the LibCal availability screen (see fig. 1).

**Figure 1.** LibCal availability screen, showing (as a red/textured block) no licenses available on the first day, Friday, July 28, but one license available (as a green/solid block) on the following day, Saturday, July 29.



LibCal can either be set up to require mediation by a library employee or to automatically approve requests. For the Software Checkout process at MUL, requests are automatically approved. Once a user checks out a license using LibCal, LibCal sends the user an email with instructions on how to download the software to their own computer and how to sign in to authenticate access to the license.

*Assign User to License Group*

Once the user has requested access in LibCal, they need to be assigned to a permissions group within Adobe. The core of the Software Checkout system is a Node.js application that connects with both LibCal and Adobe using those vendors’ APIs. The LibCal API can be queried for an

accounting of user requests. Adobe's User Management API (UMAPI) can be queried for current license assignments and can also be used to assign or revoke licenses.

The Software Checkout application sits between the two APIs in order to synchronize the LibCal data that describes who should have access to which licenses, and the Adobe system that manages who *does* have access.

A software vendor can support multiple permissions groups per institution (e.g., Adobe could have one group for authorized Photoshop users, one for Illustrator, and another for users who are assigned to the All Apps license.) If there are multiple license groups set up for a vendor (e.g., Adobe), then corresponding groups would also need to be set up in LibCal, with each LibCal group scheduling assignments. The Software Checkout application manages each of these groups separately.

The workflow the Software Checkout system uses to update assignments is fairly simple:

- Request list of current assignments in Adobe's UMAPI.
- Request list of current checkouts in LibCal.
- Compare lists to identify newly expired checkouts in LibCal (those included in the Adobe list, but whose checkout period in LibCal has expired).
- Revoke those user assignments in UMAPI.
- Compare lists to identify new checkouts in LibCal (those with current LibCal checkouts who do not yet appear in the Adobe entitlements list).
- Add those users to the appropriate license group in UMAPI.

Users in both systems are identified by email address, and both APIs return arrays of JSON objects, so it is a straightforward matter to filter the lists by user and date. Here is an example of that kind of filter function, from the `LibCalRepository.js` script. The function takes an array of LibCal bookings and returns only those for which the start date (`fromDate`) is before "right now" (`days()`) *and* for which the end date (`toDate`) is after "right now."

```
filterToCurrentBookings(bookings) {
  return bookings.filter(
    (i) => days(i.fromDate) < days() && days(i.toDate) > days()
  );
}
```

This function uses greater-than/less-than instead of greater-than-or-equal-to comparisons because the `toDate` and `fromDate` values are midnight timestamps, not whole days.

MUL's instance of the Software Checkout application is set to perform this synchronization once every 10 minutes and typically takes only a few seconds; once the synchronization is complete, the user will be in the permissions group for the software and will be able to use it. The first time a user checks out a particular software title, they will need to download the application to their device before they can use it.

#### *Software Is Checked In/License Is Unassigned*

In the Pixar system, app usage was monitored, and licenses were quietly unassigned from users after 30 days of inactivity. The Libraries needed a more definite time frame to set user expectations and to ensure a supply of returning licenses would be available to new users on a regular basis. Under MUL's system, Adobe licenses are available for 14 days at a time; although we initially opted for a "silent expiration" following Pixar's example, the Adobe system now sends

users a notification email when they are unassigned from a license group, so silent expiration is no longer possible.

Once the user is unassigned from the license group, the software will remain on their computer, but will not work. If they check out a license through LibCal again, their access will be restored as soon as the Software Checkout process updates the UMAPI again, and they will not have to download the software again. Users may opt to have the Creative Cloud application keep the software packages up to date or may update them manually as needed. Update strategies vary between different operating systems.

### ***User Authentication***

Authenticating users for this service relies on existing campus relationships with vendors. Users do not have to create new accounts, but instead use their campus single sign-on (SSO) credentials. Adobe Creative Cloud for Enterprise is federated with Azure AD and allows us to access the Adobe User Management API which we use to manage the membership of groups that are assigned various licenses. LibCal handles the loaning and scheduling portion and integrates with our campus SSO.

### ***Expanding the Service with New Vendor Modules***

Until now, this article has described the workflow for assigning licenses for Adobe applications only, and that was the original use case for the Software Checkout application. The success of that application, however, led the library to consider additional software titles for circulation. The requirements for a title that could be managed by Software Checkout are

- user-based licensing model, and
- API-base user management.

The software could be adapted to work with any vendor meeting these conditions.

The Libraries' first target for expansion was the Apple App Store via Jamf Pro, the university's software manager for App Store titles. Through Jamf, App Store titles could be assigned to students, faculty, and staff. The two titles chosen for circulation were Apple's video editing software, Final Cut Pro, as well as the audio editing package, Logic Pro. Jamf offers user-based licensing and API-based user management, so a module was developed that mirrored the original Adobe-oriented process.

The initial version of the Software Checkout application was written in an Adobe-centric fashion, but the current version has been restructured in a more modular fashion to allow for an arbitrary number of vendor-specific modules. Modules now exist for both Adobe and Jamf.

A key difference between the Adobe and Jamf modules is that the university's Adobe setup is such that users are synchronized between Azure AD and Adobe Enterprise, whereas the user creation process in the Jamf system is not as seamless. Before the module can assign the user to a permissions group, it must first check to see if the user exists in the Jamf system, and it creates a user record if necessary. Users are also required to enroll in the Jamf Volume Purchase Program (VPP) the first time they borrow Apple App Store software. This is not a difficult process, but it illustrates one way in which similar processes may require new features from one vendor to the next.

Because the Software Checkout application functions primarily as a connector between LibCal and the software vendors (e.g., Adobe and Jamf), there are several variables to set in the application's



config directory. These include authentication credentials for each API, the list of software license groups for each vendor, and the corresponding LibCal category for each license group.

Currently, Final Cut Pro and Logic Pro are the only Apple App Store products distributed via the Software Checkout process. However, now that the module is written to handle Apple/Jamf checkout, adding additional Apple titles managed through the same process would be a simple matter of purchasing licenses and adding a new permissions group to the Software Checkout configuration.

### ***Technical Requirements***

The Software Checkout application runs in Node.js, a backend JavaScript environment. Rather than being an always-on process, the application sits on a Linux server where it is activated by a cron job once every 10 minutes. There is no web interface to the application, as the web-based portions of the service are handled by LibCal.

The initial implementation did not use a database, but it was found that caching some user data could reduce the number of API calls, so the application now uses a Mongo-compatible NoSQL database to cache that information, though it is not required.

In addition to the application itself, this process relies on having a robust identity management system. Due to this constraint, the most likely candidates for employing a system might be academic, government, and corporate libraries at organizations with single sign-on infrastructure already in place. It would be a desirable outcome for public libraries to circulate software in this way, but it may be that fewer public libraries have the patron identity management capabilities to accomplish it.

## **RESULTS**

### ***Implementation***

When MUL's Mike Bomholt attended Dan Berman's talk about Pixar's system for managing Adobe licenses in 2019, he envisioned the rough outline of the system described above: a way of harnessing the scheduling power of LibCal with the flexibility of the Adobe User Management API to assign licenses on the fly. He brought the idea to the Systems team at the library; librarian Ken Irwin developed an initial proof of concept version of the system in January–February 2020. The spread of COVID-19 in the United States in March 2020 led to a greater emphasis on providing remote services, and the ability to lend software licenses for use on students' own computers was a good fit for the moment. The Libraries continued developing the service and had the first version of the software ready in time for the beginning of the fall semester in August 2020.

Although the system was developed following Pixar's model of distributing licenses for individual software titles (Photoshop separate from Illustrator, etc.), the remote learning expectations of the COVID-era led Adobe to offer educational discounts on bulk purchases of their All App license bundles. This pricing made it advantageous for the Libraries to distribute licenses for the full Creative Cloud suite. The pricing was available for student-only licenses, with a minimum order of 150 licenses. The Libraries purchased 150 Creative Cloud student licenses for the 2020–2021 academic year (AY) and set the corresponding LibCal group to accept requests only from students. There was also a separate, smaller pool of licenses for library staff purchased at the usual nonstudent rate, and a separate group was created in LibCal to handle those requests.

The service was initially announced primarily to departments with students expected to need access to the software. During the Spring 2021 semester, the service was also included in the

#GoDigital campaign to promote the Libraries' virtual services and spaces, led by librarian Alia Levar Wegner, with a promotional video created by student Anna Gyde.<sup>25</sup>

### **Results for Adobe Creative Cloud**

#### *Usage*

Usage of the service has increased steadily over the three years it has operated, and the library has added license availability to meet the demand for the service.

In analyzing the usage of the service, there are several key figures to consider:

*Licenses in use per day* reports how many users are part of the permissions group for that license at a given time. In the case of Adobe licenses that are assigned for 14 days at a time, a single checkout will result in the user being counted in the *licenses in use per day* figure for 14 days. The Software Checkout application has a reporting mechanism that outputs the *licenses in use per day* for each license group.

*Total licenses* is the number of licenses in the checkout pool for a given software title. This figure started at 150 for Adobe student licenses and was later increased to 250. The figure is much lower for other titles and for staff Adobe licenses.

The *license use rate* is the mean *licenses in use per day* figure for an identified span of time (e.g., week, semester, year). It indicates how much the service was used overall during that time. The mean is useful for comparing usage between time periods whether or not the periods are of the same length, as it reflects a rate of daily usage.

The *maximum licenses in use* reports the highest number of *licenses in use per day* for a given time period. It is most useful in indicating if the service ever approaches the *total licenses* figure.

The 150 *total licenses* purchased proved to be more than sufficient for the first year of the program, with the *maximum licenses in use* only reaching 100.

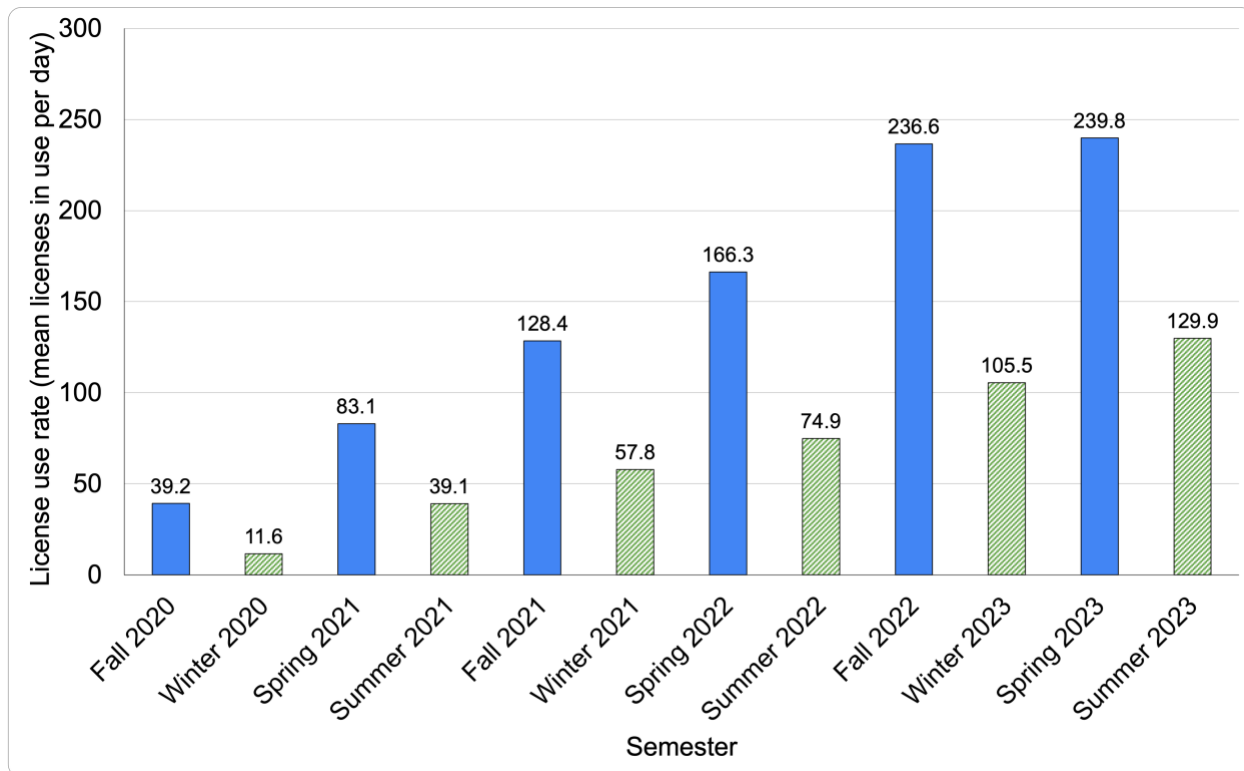
During the Fall 2020 semester, the *license use rate* was 39.2, with the *maximum licenses in use per day* reached on September 21 with 62 licenses checked out—never approaching the 150 *total licenses*. The Spring 2021 semester saw higher use, with a *maximum* of 100 and a *license use rate* of 83.1—more than double the rate in the Fall 2020 semester.

Going into the second year of the service, the Libraries started the 2021–2022 academic year with 150 student Adobe licenses, and had all 150 licenses in use for the first time on September 13, 2021. The *license use rate* for the fall semester was 128.4, and the decision was made to increase to 250 *total licenses* starting in January 2022, allowing the *license use rate* to increase to 166.3 in the Spring 2022 semester, reaching a *maximum licenses in use per day* of 249, nearly at full utilization. The increase in usage has continued each semester, with frequent periods in which all 250 licenses are in use. To date, the longest stretch of days with full utilization is three, which means that at no point has a user ever had to wait more than three days for a license to become available.

In comparing usage rates between semesters, it is useful to note that the fall and spring semesters at Miami University are typically periods of high enrollment, while the winter (January-only) and summer terms typically have lower enrollment, so lower usage during those times is also expected. Figure 2 shows the *license use rate* for student Adobe licenses over the semesters since

the service launched. (Note: these data do not reflect usage during the brief periods between semesters.)

**Figure 2.** License use rate for Adobe student licenses, by semester. Blue/solid columns indicate the fall and spring semesters, with higher enrollment; the green/textured columns are the winter and summer semesters, with lower enrollment.



**Results for Final Cut & Logic Pro**

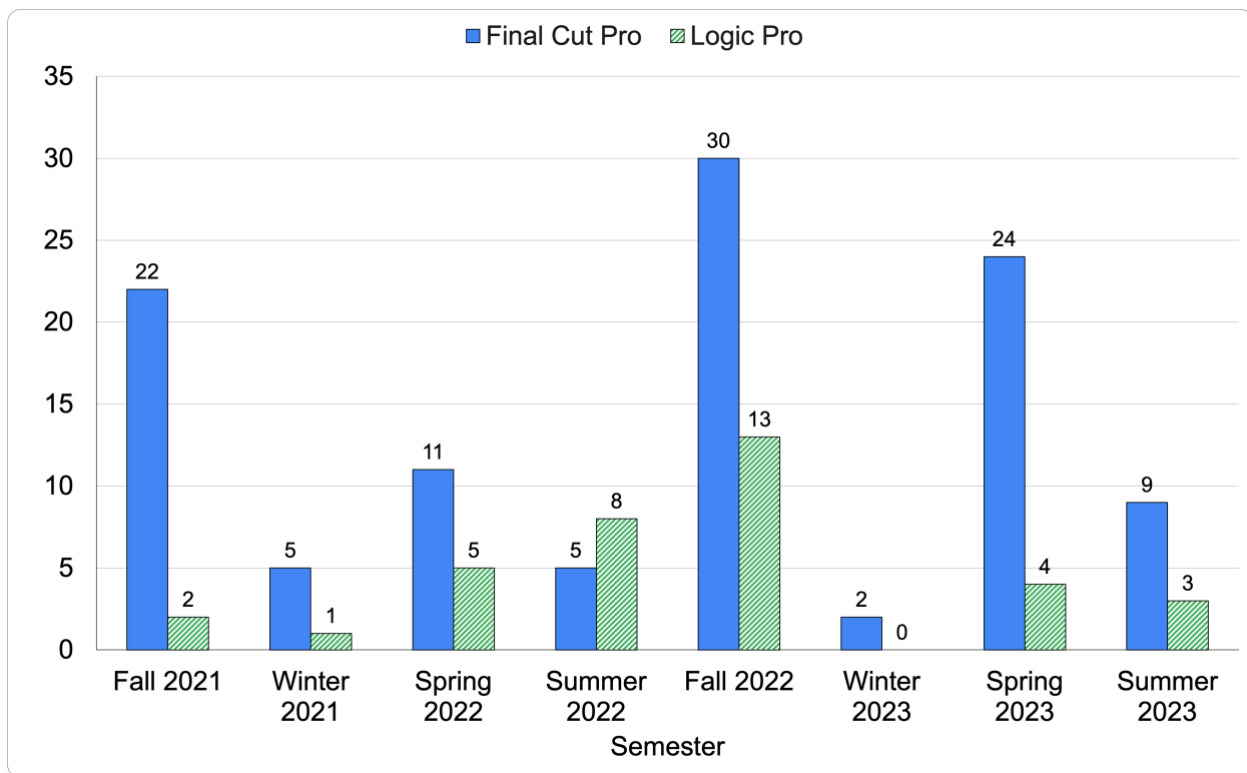
In the Fall 2021 semester, the Libraries added two Apple macOS-only titles to Software Checkout, assigning licenses through the campus device manager Jamf. Both the licensing and usage of these titles are substantially different from the Adobe Creative Cloud licenses. In evaluating the value created by the project, the authors considered the costs of the software during the period studied (2020–2023). Those costs and sales models are reflected in this analysis but may change in the future.

While Adobe licenses software on a monthly or an annual basis, the Apple titles were one-time purchases for access in perpetuity. Final Cut Pro, the video editing package, is available for \$299; Logic Pro, their audio editing software, sells for \$199. The titles are not available for short-term, lower-cost access through Apple, so being able to borrow the title from the library on a temporary basis has considerable appeal. It is worth noting that Apple does offer a one-time, 90-day free trial, which may be sufficient for some users’ needs. But a user who needs repeated access to the software, or who may want to save their free trial for a time when they don’t have access another way, might prefer to get the software from the library.

When determining the length of the checkout period for the two Apple titles, MUL staff bore in mind the existence of the 90-day free trial from Apple and set the circulation period in LibCal to match. There is less demand for Final Cut Pro and Logic Pro licenses than for the Adobe licenses,

and they circulate at a vastly lower rate. The longer checkout period, however, makes the *mean licenses in use* metric harder to use effectively. Figure 3 shows a different approach to understanding usage: the number of checkouts *initiated* per semester. This figure better illustrates the very uneven frequency of demand for these software packages. Note also the much lower figures for these titles.

**Figure 3.** Final Cut Pro and Logic Pro checkouts by semester. Blue/solid columns indicate the number of checkouts of Final Cut Pro per semester; the green/textured columns indicate the number of Logic Pro checkouts per semester.



**Challenges**

The Software Checkout service has worked well since its inception and has not required a lot of attention to maintain. There are, however, a few inconvenient and confusing features of Adobe and Jamf that users must contend with.

One opportunity for confusion for users occurs when users authenticate to Adobe. The login screen offers users a choice of using a “Personal Account” or a “Company or School Account.” Users need to select the “Company or School Account” option in order to authenticate as Miami users, and this has been a point of confusion for some users, especially those who had previously used a personal account set up under their Miami University email address.

The second opportunity for confusion is with the first-time account setup in Jamf. The Jamf Volume Purchase Program (VPP), through which MUL assigns licenses for Final Cut Pro and Logic Pro, requires users to enroll in the VPP. This means there is an account activation email users must reply to before they can gain access to software from the Apple Appstore loaned out through the program. It would be possible to eliminate this step if the university were to federate

institutional Apple IDs in Apple School Manager, but this is a substantial university-wide change that is not in the Libraries' power to undertake.

Most of these challenges are matters of potentially confusing workflows outside of the Libraries' control, so notes about confusing steps are included in the automated emails from LibCal when a user checks out software. The Libraries' email support queue receives occasional requests for assistance navigating these challenges.

### **FUTURE EXPANSION**

Adobe Creative Cloud licenses remain the flagship product shared through this mechanism, and use of the service is very high. Apple's Final Cut Pro and Logic Pro see slow but regular usage and have demonstrated that the service can handle managing licenses with multiple vendors.

At Miami University, future expansion of offerings awaits the emergence and identification of a need. If demand arises for a software title, perhaps from Google Play, the Windows Store, or the Amazon Appstore, modules can be written to connect with one or more of those services. There was recent discussion of managing Tableau licenses through Software Checkout, but the availability of free student licenses meant that there was little to be gained by developing a checkout mechanism just for library staff.

One change coming to the Software Checkout application is a back-end change to keep up to date with changes at Adobe. Adobe has announced that they will cease support in 2025 for authentication via the JavaScript Web Tokens (JWTs) currently used by the application.<sup>26</sup> The Adobe module will be updated to use an OAuth-based authentication strategy.

### **CONCLUSION**

The first three years of the Software Checkout service have been a success. Building on the backs of the giants at Pixar, Miami University Libraries' Software Checkout process can and should serve as a model for the future of libraries. It represents a logical next step in academic libraries' evolution to support access to resources that have been harder to share effectively in the past. The current legal and technical landscape allows libraries to enter this space, and usage reports at Miami University Libraries suggest that other libraries could benefit their users by moving in this direction.

The Software Checkout application is an open-source project available for other libraries to use, modify, and contribute to. To date, the software has not yet been deployed at another university, but it was designed with the intention that other institutions should be able to adopt it. Many institutions will already have both LibCal and managed user licenses for Adobe products, so the costs for initial testing of the software should be minimal, and the costs for deployment can scale with the libraries' ambition.

Libraries interested in exploring implementation of the application are invited to install and/or modify the software. The authors are interested in how the software works for another institution and are happy to collaborate on installation, implementation, and expansion projects.

### **ACKNOWLEDGEMENTS**

The authors wish to thank Kate Irwin-Smiler for her help in navigating the legal statutes discussed in the literature review.

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**ENDNOTES**

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