

Why Stay on Top of Technology Trends?

Ah, technology, how we love it. Or . . . *ahhh!* Technology! How we hate it! Some people love the current world of fast-paced emerging technology changes and will gladly and quickly embrace the newest technology tool. Other people? Not so much—rather than embracing it, they actively run from new technology, preferring the tried-and-true tools and services they already know. Why change when something still works fine?

Think of those two extremes as two ends of a “technology adoption spectrum” (see figure 1.1). I’d probably place myself somewhere between the middle and the “I love shiny new things” side of the spectrum. Most likely, you are also somewhere near the middle, maybe leaning to one side or the other.

Sometimes I do rush out and buy the newest technology. I did that with the first iPhone and the first iPad. I’ve purchased cutting-edge video cameras as well. When there’s a software update, I almost always download or buy the newest version. I also stay up-to-date with new social media tools and services.

I lean more toward the cautious side with other types of emerging technology. For example, I recently purchased a Ford Focus with the capability to sync my iPhone with the car’s Microsoft Sync software, giving me a hands-free, voice-activated phone experience while driving. I haven’t completely set up the system, and at the moment I find it frustrating to use.

Sometimes we gladly embrace a new tool, and sometimes we’d rather not; however, even if we don’t embrace a new trend, it’s still useful for us to be familiar with new technology. With that in mind, let’s look at some examples of rapid technology changes taking place in our world today, and then we’ll discuss how these changes impact libraries and library customers.

Examples of Rapid Technology Change

Rapid technology change is evident in many aspects of our everyday lives, including consumer payments, downloadable media, computing and mobile devices, and the social web.

Cashless Payment Systems

Most of us have used some form of a cashless payment system. Credit and debit cards are good examples of traditional cashless payment systems. As you probably have noticed, these payment systems are going through rapid changes.

Consider Google’s newest payment system, Android Pay. Android Pay allows a user to store credit and debit cards online (using a secure server space). Then, instead of using a credit card to pay, the customer can tap his or her smartphone to a near-field communication (NFC) point-of-sale terminal at the cash register.

There are some useful aspects of Android Pay, including

- easy, app-based storage and retrieval of all credit and debit cards—no more digging around for the correct store card
- password-protected information, so if you lose your phone you can remotely disable the account
- plans that include in-store and online store use

PayPal is another example. Founded in 1998, PayPal was bought by eBay in 2002.² What was once primarily a payment system for eBay’s online garage-sale business has rapidly grown and is expanding into

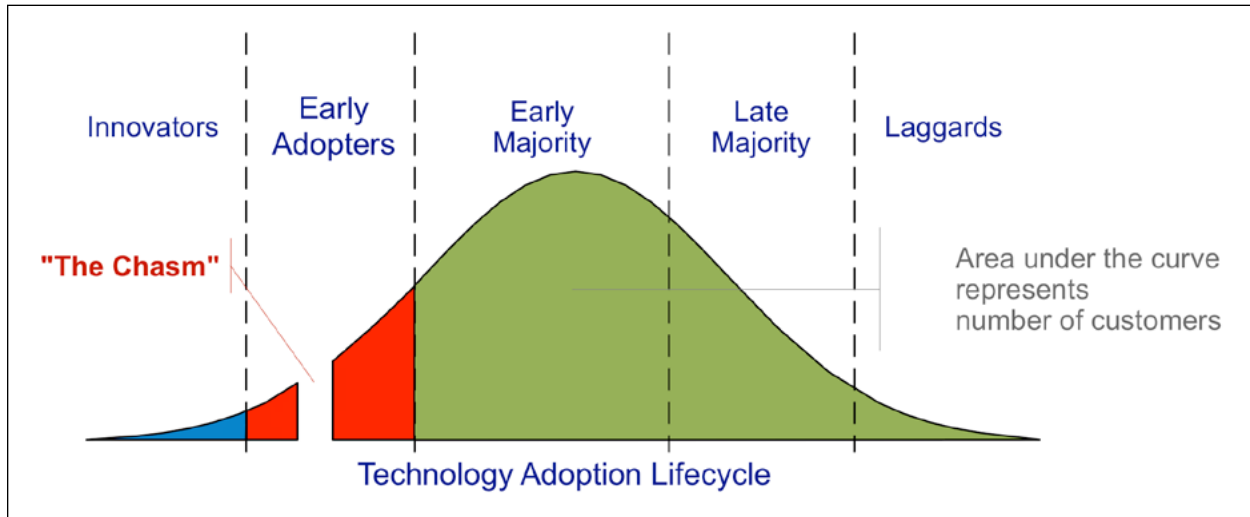


Figure 1.1
Technology adoption life cycle from Wikimedia Commons¹

other in-store payment systems. In my hometown I can now pay via PayPal at my local Dollar General store. Instead of swiping a debit or credit card, I can swipe a PayPal card or enter my mobile phone number.

One more example of emerging payment systems is Apple’s version, called Apple Pay. Apple Pay works with iOS devices, like an iPhone, and has some unique features. Part of Apple Pay’s built-in security includes using the iPhone owner’s fingerprint when paying. Apple Pay also works with the new Apple Watch. Imagine paying for something with a flick of your wristwatch!

Credit-card-based payment systems are getting easier for small business owners to use, too. For example, my wife and my son both use the same hair stylist—an independent contractor who originally didn’t take credit card payments. When my family first started getting their hair cut at her salon, she didn’t have a traditional point-of-sale cash register system or another way to take credit and debit card payments. However, she can now take credit cards through an app-based credit card service called Square (see figure 1.2).

Square, created in 2009 by Jack Dorsey (who also helped start Twitter), allows users to accept credit card payments through a mobile phone.³ When you sign up for the service, Square mails you a small, free credit card barcode reader that plugs into the phone via a headphone jack. Once you sign up for a Square account, you can easily take credit card transactions.

There are some useful applications for libraries with these new cashless payment systems. For example, many libraries take money for a variety of

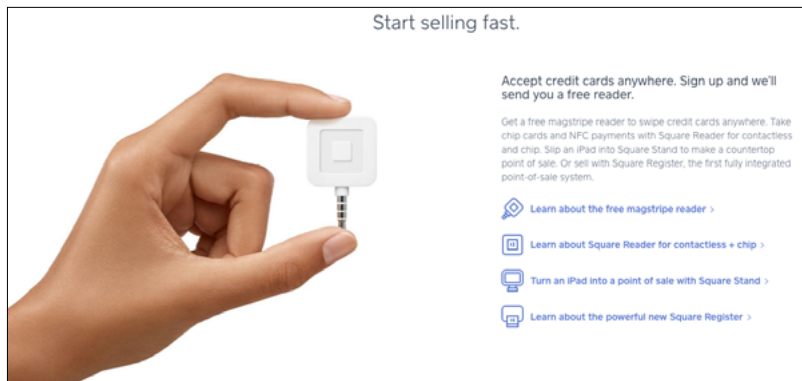


Figure 1.2
Square.com

transactions, including paying late fees, making copies, or purchasing USB thumb drives. Some libraries have bookstores or cafés on site. Using some of these new cashless payment systems might be a great service for customers and more convenient and affordable than a traditional point-of-sale system.

Downloadable Media

Downloadable and streaming media—movies, TV, music, books, magazines, and newspapers—are also going through a period of rapid change. Today many of us don’t actually buy a physical media product (i.e., a CD or a DVD with a case, or an actual printed book). Instead, we purchase an electronic file.

For example, my family, like many others, no longer watches television in the traditional way. Instead, my family watches television shows on Netflix via an Apple TV. We often rent movies from iTunes. Other people watch movies and television shows through



Figure 1.3
David Lee King's smartphone

services like Hulu Plus, Roku, YouTube, or even Facebook Watch. This is a completely different experience from what I experienced as a child. Back in the 1970s–1980s, television (in the Kansas City area, anyway) was dominated by three to four major television networks. If you wanted to watch a TV show, you scheduled your evening around the television station's schedule.

Music purchasing is going through a similar transformation. I haven't bought a music CD in a long time. Instead, I download what I want from iTunes, which automatically adds the music I purchase onto my laptop, my iPhone, and my iPad. Using this system, I always have my music with me. Other people simply stream their favorite tunes from an online music streaming service like Spotify or Pandora. In fact, in 2016, digital revenue, which includes streaming services and digital downloads, accounted for 50 percent of total recorded music revenues.⁴

Today, following new bands can be an interesting experience. An up-and-coming band usually has a website that it considers its home base. Then it uses social media tools like Facebook or Twitter to reach out to fans. When the band wants to share new music with its listeners, it might use any number of marketing or “social sound” services—including SoundCloud, Bandcamp, or ReverbNation—to share its music. It'll most likely create some sort of music video, too, even if it's a simple lyric-based video that appears as the song plays, which will likely be uploaded to the band's YouTube channel.

Libraries need to think about how these types of changes will affect their media service offerings. Today, DVDs and CDs are still easily available, as are print books, but there's a possibility that within five to ten years, consumer media will be primarily

digital—or at least there will be a greater mix of physical and digital options than there is now. If the digital trend continues, libraries will need to rethink much of what we do, including where collections are stored and accessed, how the physical building is used, and even how checkout works.

Computing Changes

Consider for a moment changes in computers that you have experienced. Most likely thirty years ago you wouldn't have been able to afford the computer sitting on your desk or lap. In fact, it didn't exist. Computer technology refreshes often enough that in five years' time, whether or not your computer has actually worn

out enough to get a new one, you will be hard-pressed to keep current with updates to software if you are using the same computer.

Computer technology changes have yet to slow down. Graphical user interfaces (GUI) to computers, like Microsoft Windows or Apple's Mac OS X systems, are almost forty years old and have yet to standardize. That's one reason both companies release newer versions of their systems every couple of years (i.e., Microsoft Windows 3.0, 95, 98, ME, NT, XP, Vista, 7, 8, and 10).

Newer, more mobile-friendly devices—like smartphones (see figure 1.3) and tablets—are being increasingly used for general web-based computing needs. According to the Pew Research Center, most Americans own some type of mobile device:⁵

- Of American adults, 77 percent have a smartphone.
- That increases to 92 percent if you're 18 to 29 years old.
- Of American adults, 51 percent own a tablet computer.
- Of American households, 80 percent have a desktop or laptop computer.

Adults are using their mobile devices for activities like browsing websites, performing searches on search engines, and checking email. These activities used to be performed primarily on a desktop computer. This trend will continue to gain traction as more people purchase mobile devices.

Computing changes continue to have a major impact on libraries. Libraries will need to make sure websites and online catalogs work on all major types of devices, including desktop computers, smartphones, and tablets. Libraries should be planning now

for increased Wi-Fi use as more customers purchase mobile devices. Some libraries are also exploring ways to use tablet devices for library functions, like reference services in the building or outreach events.

The Social Web

The emerging social web has also been the cause of some rapid technology changes. Because of simple-to-use social media tools like Facebook and Twitter, it's now easy to connect and communicate with other people. These social media tools are still relatively new. Founded in 2003, Myspace, one of the early modern social networks, was getting more page views by 2005 than Google.⁶ Facebook appeared in 2004, YouTube was founded in 2005, and Twitter followed in 2006.⁷

Another online social tool is blogs, which have been around in one form or another since the late 1990s. Blogs help facilitate conversation (and rapid technology changes) because most blog posts include a comment box after each article.

Blog-based tools have found their way onto mainstream news media. Have you noticed some form of comment box under each article on newspaper websites (see figure 1.4)? That idea comes directly from blog-based technology.

Social media is having a huge impact on libraries. Libraries can now directly connect and have conversations with customers outside the building. This ability opens new forms of reference services, online readers' advisories, and remote consultation services, as customers can communicate with library staff through social tools, like Facebook and Twitter, or through a comment box on the library's website.

We are living in a period of rapidly expanding technology—hardware, software, and online technology—and it doesn't appear that these rapid changes will slow down any time soon.

How Rapidly Changing Technology Impacts Libraries

Since technology continues to make rapid advances, library staff need to stay on top of technology trends by being aware of the changes taking place and keeping their technology-focused skills as up-to-date as possible. Following technology trends and emerging skill sets can help library staff in their current jobs and in future job opportunities. Library customers also benefit from staff knowledge and skills.

Current Library Jobs

As an example, let's use a hypothetical youth services library staff member at Topeka and Shawnee County Public Library (TSCPL). If you worked at TSCPL in the

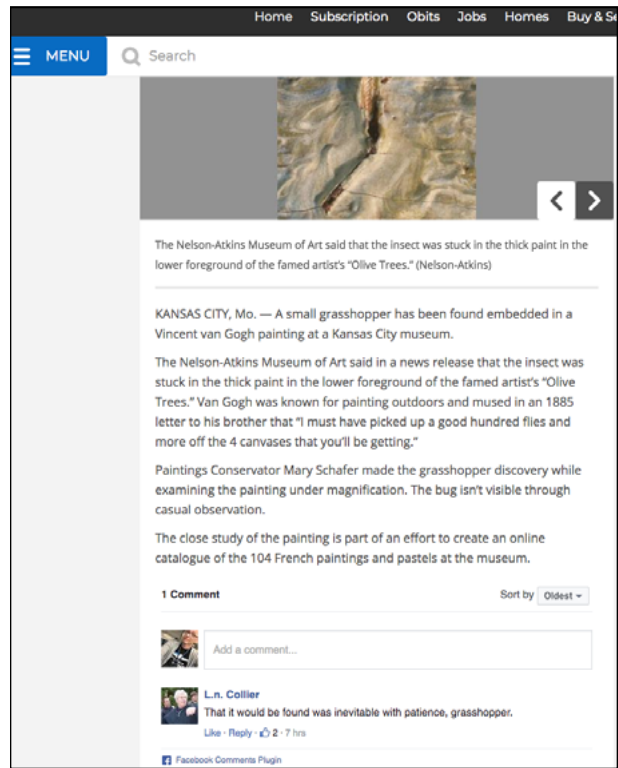


Figure 1.4
Comment box at cjonline.com

youth services department, you would be responsible for traditional children's librarian tasks, like story time or staffing the youth services reference desk. However, you would also have some nontraditional technology-oriented responsibilities.

A TSCPL Youth Services librarian's job might include

- **Writing blog posts.** The library's tweens and teens sections of the website include blogs. Staff post updated information about the library, programs and events, new authors, and other teen- and tween-related information. There is also a parents' blog that is maintained by youth services staff.
- **Creating Facebook page status updates.** The library has a Facebook page, and staff create posts about youth services news and events.
- **Setting up games for teens.** One of the library's teen areas is equipped with console-based electronic gaming. Staff need to switch out games, and they should be familiar enough with game play to get people started, if needed.
- **Setting up iPads.** At times, we have offered iPads for tweens. When we did that, staff needed to research and download appropriate apps for iPads that were offered in the tween area of the library. They also helped determine appropriate access levels on those iPads so that apps couldn't

be deleted by customers (accidentally or otherwise).

- **Making a video.** Staff help groups of teens create library-related videos, perhaps telling a story about a teen-related event at the library. This project might involve using a video camera, editing a video, and uploading the finished video to YouTube.

Library blogging, social media posts, tablet technology, and video creation are some of the tasks being integrated into librarians' jobs, and not just to youth librarians but librarians at all types of libraries and in varying positions. The role of the librarian is expanding, and being able to incorporate these emerging skill sets into a librarian's job responsibilities is prudent in today's emerging technology environment.

Advancement Opportunities

Learning some of these newer emerging skills can also make a difference when it comes time to interview for that next job. Here are examples from two job postings for teen services librarians:

- “Creates opportunities for teens and tweens to contribute to the library in venues such as Teen Advisory Boards, social media postings, blogs, book clubs, etc. May perform one or more of the following duties: investigates technologies that will improve services; creates, develops, maintains, or contributes to the community library webpage and social media; supervises hourly rate employees and volunteers; compiles bibliographies and/or develops library user guides.” (Teen Librarian, Queens Library, New York, NY).⁸
- “The successful candidate is passionate about serving young people and about 21st century technology.” (Teen Services Coordinator, Chattahoochee Valley Libraries, Columbus, GA).⁹

These skills are valuable in more than the teen librarian realm. Examine job descriptions in most library-related jobs. You'll see that libraries are realizing they need staff who are not only equipped with technical skills but who also embrace technology and emerging trends.

Are you unsure about your current skill set? Browse through library job ads to get an idea of what types of skills you need to work in today's library. Search for job ads that match your interests, and read



Figure 1.5
David Lee King with his iPad

through them to figure out which skills are in high demand. Pay particular attention to specific technology needs that are mentioned. If the ad lists a skill you don't yet have—for example, creating videos—you have an opportunity to start learning that new skill or tool and, as a result, you will be a stronger candidate for future job opportunities.

How Technology Skills Help Your Customers

Learning new technology-based skills also impacts your ability to successfully help library customers. Here are a few areas where you might need to develop new skill sets to help customers with basic technology needs:

- **New e-book apps.** E-book devices are rapidly evolving. A few years ago, libraries would experience an after-Christmas rush of customers with new e-book readers. Customers would unwrap their e-book readers, take them to their local library, and ask for help downloading the library's e-books and other media. In today's world, customers might receive an iTunes gift card with instructions to visit an app store and install the OverDrive or Hoopla app to their mobile device. After that, they might visit the library for help. At first glance, this task sounds pretty easy to accomplish. However, our customer could have any variety of mobile device that may be using Apple iOS or one of the many versions of the Android operating system. Staff would need to know which app stores to use on which devices and operating systems. We also need to know how to search for and download an e-book

in our e-book collection, which, depending on the library, might mean becoming familiar with multiple e-book databases. Being familiar with a variety of devices and databases is the best way we can help our library customers interact with the library's downloadable collections.

- **Knowing your way around a computer.** Today's library has a variety of computers, including PCs and Macs, desktops and laptops, tablets (see figure 1.5), and even e-book readers. Library staff need to know the basics of how to operate each of these systems. When a new operating system is added (Windows 10 might be coming to your library at some point, for example), we need to know how to use those systems—preferably before our customers ask.
- **Connecting to Wi-Fi.** Our patrons bring their own devices to the library, which might include Apple and Windows laptops and a variety of tablets and smartphones. Each of these devices can connect to the library's Wi-Fi network. Library staff don't need to be experts on each computer platform, but they do need to know enough to help customers connect to Wi-Fi on each of these devices.
- **Other devices.** Your library's patrons probably own a variety of consumer technology, like cameras, USB drives, or smartphones. Library staff need to know the basics of how to connect these devices to the library's public computers (assuming policies are in place that allow customers to plug things into the library's public computers). Some of these devices connect to Wi-Fi, as well. We need the ability to help our customers connect all these devices to Wi-Fi and to the library.

We don't have to be experts on each device a customer brings into the library. But we do need to capably help our customers get started. We also need to be comfortable enough with technology tools and services that we can help point our patrons in the right direction, even if we aren't intimately familiar with how the device works.

Innovation Cycles

Let's switch gears and talk about innovation cycles, especially innovation cycles for consumer technology. Understanding the basics of these current innovation cycles can help you monitor technology trends and alert you to the technology changes that may be coming to your library.

There are different types of innovation cycles, including

- a global innovation cycle called the Digital Revolution

- annual consumer technology innovation cycles, conferences, and trade shows

Digital Revolution

We are currently in the middle of a global innovation cycle called the Digital Revolution.

According to Wikipedia:

The Digital Revolution is the change from mechanical and analogue electronic technology to digital electronics which began anywhere from the late 1950s to the late 1970s with the adoption and proliferation of digital computers and digital record keeping that continues to the present day. Implicitly, the term also refers to the sweeping changes brought about by digital computing and communication technology during (and after) the latter half of the 20th century. Analogous to the Agricultural Revolution and Industrial Revolution, the Digital Revolution marked the beginning of the Information Age.¹⁰

The Digital Revolution has seen multiple changes, including personal computers, the internet, and mobile devices. Some current trend watchers are predicting the beginning of the post-PC era. They are seeing a decline in traditional desktop and laptop computer sales and a rise in more mobile devices like smartphones and tablets.

Annual Consumer Technology Innovation Cycles

Some innovation cycles are closely related to the consumer technology industry. Generally speaking, there is an annual trend cycle. Around October, consumer technology companies (like Samsung or Sony) start discounting current products for the holiday season. After Christmas, these companies come out with their most up-to-date products, usually between January and April.

Many of these newer products are unveiled each January at the Consumer Electronics Show (CES). Products that have heralded technology change have been introduced at CES, including the VCR (1970), the camcorder (1981), CDs (1981), and netbooks (2010).¹¹

Top technology trends from the 2017 CES show included

- voice assistants, like Amazon's Alexa and Google Home
- smart home technology
- self-driving cars
- augmented and virtual reality
- drones¹²

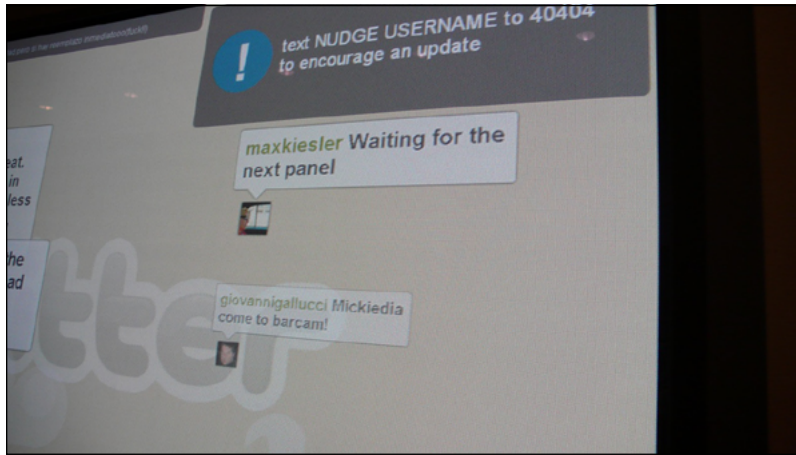


Figure 1.6
Twitter at SXSW 2007, by Max Kiesler

Keeping track of what's happening at CES can help you stay on top of new consumer technology trends.

New web and social media tools are created throughout the year, but they often rise to prominence during South by SouthWest (SXSW), a series of festivals and conferences held each March in Austin, Texas.

The unveiling of Twitter at SXSW and its subsequent popularity illustrates the important link between conference trade shows and consumer usage. Twitter was created in March 2006. During the 2007 SXSW event, the company was able to promote itself by displaying tweets of conference sessions on large screens (see figure 1.6), which captured attendees' interest. Now, in 2017, Twitter has over 3,800 employees and over 319 million active users.¹³

Keeping track of what's hot at SXSW can help you learn about web-based tools that may be gaining in popularity in your community.

Consumer Behavior and Innovation

Consumers and their dollars are driving and shaping the focus of technology companies. That means that consumers like you—and your library customers—are, in effect, shaping the future technology that your library will be using in five to ten years.

By paying attention to current trends, you may be able to help prepare your library for the next wave of technology changes headed your way.

Libraries in Transition

Our world is going through some major technology upheavals. The way many of us do simple things—like watching TV, reading a book, or checking email—is changing. These messy transitions are also affecting

libraries. What once worked for libraries may not work anymore.

Most likely your library still has traditional library customers. These customers ask questions at the reference desk (see figure 1.7) and check out physical books. You also have a new breed of library customer. These patrons are bringing in any number of electronic devices, and they want those devices to work with your library's technology. They want to plug into your public computers. They want to connect to the library's Wi-Fi network. They want to upload and download content from their device to Facebook, Instagram, or YouTube. They want to

download e-books, digital audiobooks, and music. As they do all this, they also want to recharge their devices.

Libraries are in a time of rapid transition and need to figure out how to serve this new subset of their customer base, while also providing services for their more traditional customers. If we aren't successful in making this technology transition, patrons who have made that transition for themselves might simply bypass the library by finding answers (though not always the best answers) through Google, finding and purchasing books through Amazon, or downloading music from iTunes.

Technology changes affect our traditional users too. The books, magazines, and newspapers they love to read are moving to digital formats. For example, in November 2010, *U.S. News & World Report* switched to a primarily digital format.¹⁴ More magazines and newspapers are sure to follow. Library staff need to be ready to help these customers find their news and entertainment sources in newer formats—online and digital.

Consumer Technology Is Shaping Libraries of the Future

Trends in consumer technology will affect technology in libraries. These changes gained traction with the advent of the personal computer in the 1970s and are still happening today. In today's library, simple functions like internal staff communications might be email-driven, which requires access to a computer or mobile device. Basic ready-reference answers are found using online tools. Most, if not all, library staff need a computer to do their jobs.

Think about the growing popularity of e-books and e-book readers. Many of our libraries have e-books, supplied by vendors like OverDrive, Hoopla,



Figure 1.7
Image of reference desk at Anythink Libraries

or Bibliotheca. Perhaps your library's e-book collection is currently a small part of the library's overall collection, but what might that collection look like in five, ten, or even twenty years? If e-books become a large part of the library's collection, think about the impact that could have on the library's budget, staffing needs, and even on the library building itself.

Conclusion

It's important to start planning to future-proof your library, and here are some things you can do right away:

- Scan the horizon for emerging trends. We'll learn more about how to do that in the following chapters.
- Train customers and staff. Make sure to teach staff how to use a variety of consumer technology tools.
- If possible, set up a technology petting zoo. If your library's budget allows it, buy some of these tools and let staff learn hands-on. This allows library staff to learn how a new technology device works in advance, instead of encountering it for the first time with a customer.

Having no plan for staying on top of technology change practically guarantees failure and irrelevance for libraries. Instead of that bleak outlook, let's learn to ride these technology changes as they happen and be ready and waiting for our customers when they come to us with new tools and questions.

Notes

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