Chapter 2

Koha

The Original Open Source ILS

Koha currently holds the position as the most widely implemented open source integrated library system (ILS) in the world and one of the top ILS products of any type globally. This product was initially created to serve a small group of libraries in New Zealand. Since they released it as open source software, other libraries began to implement and improve it. Today Koha embodies a feature set comparable with almost any commercial competitor, has a technical architecture able to meet the demands of at least mid-sized libraries, and finds use in ever larger libraries and consortia. The history of Koha has been one of continuous development, marked by multiple episodes of involvement by commercial organizations. Today Koha finds use in almost all regions of the globe. While covering some of this international perspective, this section focuses primarily on the impact of Koha for libraries in the United States.

Koha: A New Zealand Gift to Libraries

Koha was one of the first ILSs developed as open source software. While there were some earlier projects that never gained traction, Koha has been continuously developed by a growing community of developers across the globe. It currently ranks among the most widely implemented ILSs in the world, finding use in all types of libraries.

The initial version of the software was created in 1999 by a small software development firm called Katipo Communications for a group of three libraries located in the southern part of the north island of New Zealand near Levin. These libraries, serving a population of about 30,000, are now managed by the Horowhenua District Council, but from 1997 through 2016, they were operated through a nonprofit organization called the Horowhenua Library Trust. Rosalie Blake was the Head of Libraries for Horowhenua Library Trust at that time.

Joann Ransom was also associated with the Horowhenua Library Trust at that time and has since been a very active advocate of Koha and open source software in libraries. Ransom retired from the organization in June 2016, when the libraries reverted to direct operation by the Horowhenua District Council.

In the late 1990s the Horowhenua libraries faced the need to implement a new automation system. They were using an ILS called CataList developed by Contec Group International. With the year 2000 approaching, there was concern that at least some components in the aging computer and network infrastructure would fall prey to the infamous Y2K date problem. Their review of the commercial options failed to identify a suitable alternative. Rather than purchase another proprietary product from the same vendor or other supplier, the libraries opted to commission the development of a new system tailored to their needs.

The Horowhenua Library Trust engaged Katipo Communications, a small firm offering a variety of information technology and development services, to develop a new system according to its specifications. Rachel Hamilton-Williams founded and headed Katipo, and the firm gained international recognition for its work with Koha.

When Koha was initially developed, the concept of open source software was relatively new to the library community. The bold move was made to release the software as open source under the GNU General Public License (GPL) rather than having the libraries or Katipo retain direct ownership. By releasing the software,

Katipo anticipated gaining future business for customized development, and HLT hoped for improvements to the system as it found use in other libraries. Both expectations were realized many times over.

The new system was named Koha, which means "gift" in the Maori language. The word is often used to designate a donation that is offered for an event or cause.

Katipo Communications employed Chris Cormack as lead developer for the project. Cormack has remained involved with Koha almost continuously ever since. Most recently he has been affiliated with Catalyst IT, a software and services firm based in Wellington.

The success of Koha at the Horowhenua libraries did not go unnoticed, and the system was soon implemented by other libraries in other parts of the world. Although its spread was gradual in the first few years, other libraries saw it as an alternative to the proprietary systems. Many of these libraries contributed to the enhancement of Koha to make it a more robust ILS with a more complete range of features. Koha also evolved in ways to strengthen its scalability and performance.

In 2002, the Nelsonville Public Library, with seven branches serving Athens County in Ohio, became one of the first libraries in the United States to formally commit to implementing Koha. Stephen Hedges, director of the library, was interested in adopting Koha even though it lacked some essential capabilities. Rather than spend its funds on purchasing a proprietary, Nelsonville Public Library invested $10,000 in development services to enable Koha to meet it requirements.

Several enhancements were essential for the software to be successful in a mid-sized public library in the United States. The initial version of Koha used a simple metadata structure. For Koha to be considered a viable system for a broader base of libraries, it was essential for Koha to support the MARC family of standards for bibliographic records to enable it to exchange records with other libraries. The Nelsonville Public Library also required support for the Z39.50 protocol, the international standard for the search and transport of MARC records. Once these features had been completed, Koha was implemented in the Nelsonville Public Library in August 2003. These enhancements further strengthened the position of Koha, and its use expanded in both the United States and other geographic regions.

LibLime: First US Koha Services Company

Koha entered a new phase with the involvement of a new commercial business oriented to its development and support. A new company named LibLime was founded in March 2005 led by Joshua Ferraro, who was formerly a systems administrator for the Nelsonville Public Library. This company became heavily involved in further expanding the capabilities of Koha, though its role with the broader Koha community eventually became strained.

One of the important enhancements to Koha at this time was the incorporation of a new search module able to perform quickly for libraries with large collections. Although MySQL can support large-scale applications, it has limitations in its capabilities for full-text search, especially for complex structures like the MARC bibliographic records. It is common for applications to make use of a separate utility for indexing, search, and retrieval. Following a technical review that also considered alternatives such as Apache Solr, LibLime selected the Zebra search-and-retrieval module created by Index Data, a software development firm specializing in library-oriented applications. Zebra provides high-performance capabilities for the indexing and retrieval of MARC bibliographic records. Koha has continued to include Zebra in its current versions.[1]

Although Zebra was a leading alternative then, other open source indexing technologies have since been created for large-scale implementations, such as Apache Solr and Elasticsearch. Work has been underway to enhance Koha with Elasticsearch as an optional indexing component instead of Zebra.

LibLime attracted many libraries to Koha along with its support services. Some of its early implementations included the Crawford County Federated Library System, Stow-Munroe Falls Public Library, the Central Kansas Library System, the Northeast Kansas Library System, and many other libraries.

In 2008, the Westchester Academic Library Directors Organization selected Koha to replace the Voyager ILS that supported its fifteen academic library members. This selection involved a partnership with LibLime to support a major development initiative to enhance Koha with the key features needed for academic libraries. This project resulted in the creation of LibLime Academic Koha, a fork of the software that caused sharp controversies with the broader Koha development community.[2]

From the period following its founding in 2005 through about 2009, LibLime was the dominant provider of Koha services to libraries in the United States. The company amassed a large customer base of clients and led an ambitious development agenda for the software.

In February 2007, LibLime acquired the Koha-related assets of Katipo Communications.[3] The acquisition included copyrights, the koha.org domain, and documentation and responsibility for active service contracts. Katipo employees involved with Koha transitioned to LibLime. Following this business arrangement, Katipo was precluded from future work with

Koha but remained active in its many other projects and services.[4]

In September 2009, LibLime announced LibLime Enterprise Koha as its hosted service and new development initiative for Koha. LibLime positioned this offering as a hosted ILS that it would develop aggressively and independently. LibLime Enterprise Koha would also include optional modules outside the Koha codebase. The Biblios.net cataloging utility and the GetIt acquisitions tool were developed to function with any ILS and were not released as open source software.

The launch of its essentially privately developed forks of Koha sparked considerable animosity between LibLime and the global development community. Although LibLime promised to release the code corresponding to the enhancements it created, the spirit of cooperation had fallen away. This rift also impacted the company's reputation for some libraries that perceived its strategies as not aligned with the values of open source software. Although most of its customers remained loyal, the company's position was weakened, leaving an opening for new competitors providing services surrounding Koha as developed by the global community.

PTFS Enters the Koha Support Arena

Another US-based company, PTFS (Progressive Technology Federal Systems), entered the Koha support services realm in 2008. It initially worked to implement Koha within its niche of libraries associated with US federal government agencies, but it also expanded to the realm of public and academic libraries. PTFS had previously created a digital archiving platform called ArchivalWare, which had been adopted by many government agencies.

From the time of its initial involvement with Koha, PTFS encountered a tense relationship with LibLime and others in the global development community. The company continues to provide support services for Koha, mostly under the banner LibLime, a PTFS Company. It has retained many of the customers it acquired from LibLime, though some have shifted to other support providers or have implemented proprietary ILSs. PTFS has continued development of library automation software increasingly separate from Koha. The company introduced BiblioVation as a new ILS that can be integrated with its other offerings to form a comprehensive platform for managing print and digital resources. It has implemented a discovery layer with a different interface and codebase than the online catalog module of Koha.

Koha.org, the primary domain associated with Koha, became a key source of contention. This domain held the documentation for Koha and many other essential resources. Its ownership by LibLime, and then by PTFS—organizations not closely aligned with the global Koha development community—was increasingly problematic. The global community had hoped that the domain would be transferred to a neutral party, but PTFS retained ownership. In response, a new domain, koha-community.org, was launched and continues to serve as the primary domain for all content and activities associated with Koha and its global development community.

With its position weakening for new clients and the company in internal disarray, LibLime offered itself for sale, and it was acquired by PTFS in January 2010. Many key personnel had departed the company, with only eleven remaining out of the twenty-eight employees in place at the end of 2008. The acquisition included the LibLime brand and domain, the koha.org domain LibLime acquired from Katipo, copyrights, the US trademark for Koha, and documentation related to Koha, as well as responsibility for active service contracts. LibLime CEO Joshua Ferraro departed from the company. At the time of the sale, LibLime had 108 support agreements spanning 160 organizations, representing a total of 500 individual library facilities.

The ByWater Solutions Era

ByWater Solutions was launched in 2009 as a startup to provide support services for Koha. The company was founded by Brendan Gallagher and Nathan Curulla. The company aligned itself with the global Koha development support community and entered into partnerships with like-minded companies such as BibLibre, a Koha support company for libraries in France. This positive relationship with the global community and its adherence to the spirit of open source were well received. ByWater Solutions has attracted a steadily increasing number of libraries signing agreements for its support services. Today ByWater Solutions stands as the dominant provider for Koha support services in the United States.

Implementations

Koha has been implemented in tens of thousands of libraries across the world. The libraries.org directory includes 4,705 libraries using some form of Koha. Since Koha is open source software, it is difficult to track all its implementations. It is used in many countries that are not well represented in libraries.org. The total number of implementations may exceed 10,000.

Open source software does not imply an absence of commercial involvement. Quite the contrary, open source software projects often encourage for-profit companies as well as nonprofit organizations to become involved with their communities. In contrast

to the proprietary software realm in which business activity turns to a large extent on license fees, open source projects provide many opportunities for companies to provide services for which they can charge fees. Dozens of companies have become involved with Koha. Some companies are dedicated solely to providing services for Koha, some provide services for a variety of open source library-oriented products, and others may be involved with both open source and proprietary technologies. The organizations providing Koha services often compete with each other to provide services to libraries while still cooperating within the broader Koha development community. Most Koha service providers operate within a specific country or geographic area; others may specialize in specific types of libraries, such as those associated with governmental or military organizations.

Service providers can make open source software available to a wider range of libraries. It is a misconception that libraries need to have in-house technical expertise to use open source software. Libraries with technical expertise can implement open source software self sufficiently. Using open source software independently in this way involves allocation of internal resources, such as the efforts of technical and nontechnical personnel, computing resources, training, testing, documentation, and related tasks. Engaging a service provider can relieve the library of all, or at least most, of these tasks. In most cases, using an open source product with a comprehensive set of hosting and support services from an external provider will require no more internal technical expertise than would be needed for a proprietary system.

Patterns vary by country and region regarding the support arrangements for open source ILS products. In the United States, most parts of Europe, and the United Kingdom, the vast majority of libraries implementing Koha rely on commercially provided support services. In the developing world, libraries often lack financial resources to support either licenses to proprietary products or support fees but are able to cultivate the technical expertise to independently implement open source software. Libraries in these regions may also cooperate to create local customizations that can be shared and reduce the technical burden for individual organizations.

Koha in the United States

Table 2.1 presents the numbers of libraries using Koha in the United States as recorded in the libraries.org database of libraries in Library Technology Guides. These numbers should not be taken as definitive. There may be some libraries using Koha missing from the registry, especially among special libraries that may not have a public website for their library or information center. The table shows a small difference between the combined totals for each of the major support options and the total counts in libraries.org, which represent those working with other support providers.

Table 2.1. Number of libraries using Koha in the US

Support Option	Libraries	Facilities
ByWater Solutions	667	1,041
PTFS/LibLime	223	515
Independent	80	128
Equinox	16	18
Combined	986	1,702
Total in libraries.org	997	1,714

Libraries.org can also be used to illustrate shifts in support options. There are 177 libraries spanning 258 facilities that have moved support contracts from LibLime to ByWater Solutions.[5]

In the United States, ByWater Solutions provides support for the largest number of Koha implementations. Although not absolutely comprehensive, the libraries.org directory in Library Technology Guides shows 694 libraries including 1,041 facilities using Koha with support from ByWater Solutions.[6] ByWater Solutions also has some clients in Canada (8 libraries, 25 sites) and other countries. The majority of these are public libraries (432 or 62 percent), followed by academics (100 or 14 percent). Figure 2.1 illustrates the types of libraries using Koha with support from ByWater Solutions.[7]

Koha has also been implemented by libraries with varying sizes of collections (figure 2.2). Using the libraries engaging the services of ByWater Solutions as an example, most libraries using Koha are medium-sized, with 52.3 percent having collections between 20,000 and 200,000 volumes; 42.1 percent having collections less than 20,000; and 5.6% percent having collections with more than 200,000 volumes. It is also important to note that many of the small libraries using Koha do so as part of a system shared among the members of a consortium. The Northeast Kansas Library System operates a Koha implementation shared by fifty-three members; forty-two libraries participate in the Central Kansas Library System implementation of Koha; and thirty-three libraries participate in the Texas Library Consortium Catalog. Table 2.2 shows how Koha has evolved since 2002 and looks at how many contracts Koha has in place, how many libraries they're working with, and how many institutions have implemented Koha each year since 2002.

United Kingdom

A company called PTFS Europe has become established as the leading support provider to libraries in the United Kingdom. PTFS Europe operates

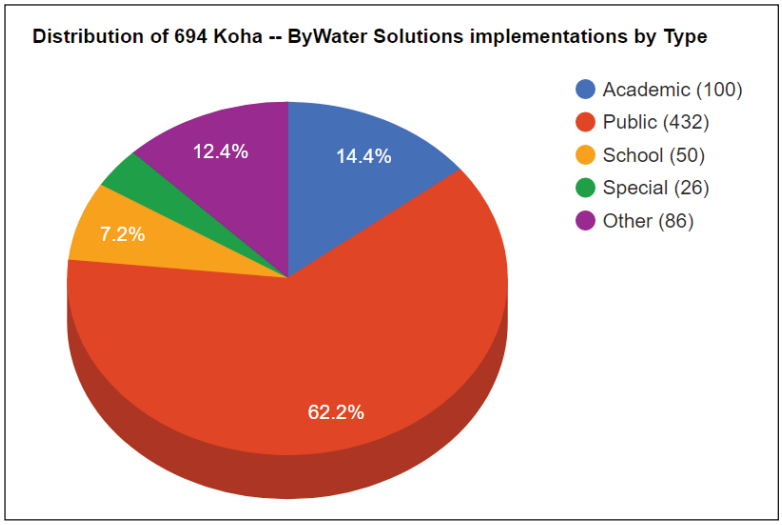

Figure 2.1
Breakdown of libraries by type using Koha with support from ByWater Solutions

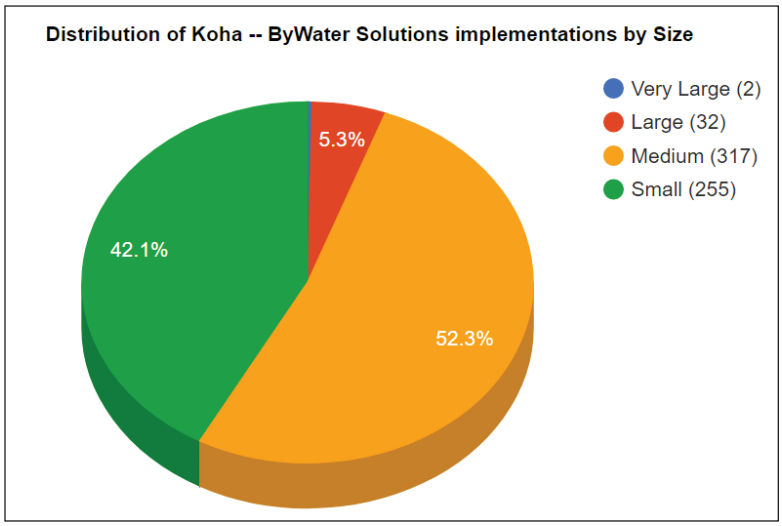

Figure 2.2
Distribution of Koha ByWater Solutions implementations by size

independently from PTFS and is a distributor of its ArchivalWare product in the region. PTFS Europe works with the Koha community and not with LibLime Koha, though it does provide support for BiblioVation. Currently 87 libraries (212 branches) rely on PTFS Europe for Koha support services. PTFS Europe has also developed an academic course list management system called rebus:list. In addition, the company provides services for the open source Evergreen ILS for consortia (see chapter 3).

Technical Characteristics

Koha was developed in the Perl programming language, and the many scripts that comprise the application were released as open source. It relies on MySQL, an open source relational database management system, and the Apache web server and ran on Linux servers. These components, often called the LAMP stack, were a very popular suite of technologies for open source development at that time. Since that time, other environments have been on the rise for web-based applications, notably PHP, Ruby on Rails, and Python. Enterprise-level applications are likely to be written in Java. Perl, however, continues to be a highly regarded programming language and is expected to remain viable indefinitely.

Perl, known for its elegant ability to process strings and manipulate data, was adopted widely in web development projects. Perl scripts are interpreted in real time rather than being compiled into executable programs. Interpreted languages tend to have more overhead than compiled languages such as C. In its standard implementation, each task invoking a Perl script also loads a separate instance of the Perl interpreter, adding additional overhead. One of the challenges for Koha as it has evolved for use in libraries with larger collections and heavier transaction loads involves optimizing the performance of Perl.

The performance issues related to using Perl can be addressed through the Plack, a technical interface designed to decrease overhead and increase performance. When operating through Plack, the application operates through a single instance of Perl and related modules instead of creating child processes for each script invoked. The use of Plack requires that Perl programs be tested and modified as needed for compatibility. Plack has been supported as a configuration option since about version 3.22. PTFS/LibLime has also implemented Plack for its Koha-based products.

Plack
http://plackperl.org

Work has also been accomplished to improve the search performance and scalability of Perl though the use of Elasticsearch. This search technology developed by Elastic has become one of the key components

Table 2.2. Statistics for Koha 2002–2016

Year	LibLime			PTFS			ByWater		
	Contracts	Libraries	Install	Contracts	Libraries	Install	Contracts	Libraries	Install
2016							70	91	949
2015							40	76	919
2014							53	94	879
2013							68	150	785
2012							34	40	554
2011							545	231	446
2010				44	63	147	40	155	167
2009				12	150		7	77	78
2008									
2007	29	61	340						
2006	17	26	311						
2005									
2004									
2003									
2002									

for large-scale websites and applications that rely on a search interface with relevancy and faceted navigation. Elasticsearch is an alternative to Apache Solr, which has been a more long-standing search component for web-based applications. Most of the technical work to implement Elasticsearch for Koha has been completed, though it is not yet a production-ready option. Some libraries, especially those supported by BibLibre, are already using Elasticsearch in their production implementations of Koha.

Elasticsearch
https://www.elastic.co

The software can be installed on any of several versions of Linux, though Debian is most frequently used. While Debian may represent the most commonly used environment for Koha, institutions with experience with other operating systems in the Linux family should be able to successfully install Koha and its associated components.

Koha is not designed to work under Microsoft Windows, even though there are versions of each of the constituent components available. Executables for Perl (notably ActivePerl), MySQL, and Apache Web are all available for Microsoft Windows, but the many related modules and other dependencies have not been developed or tested.

Koha was designed to rely on the MySQL relational database, an open source tool that has been widely implemented in web-based applications. Sun Microsystems acquired MySQL in 2008; ownership passed to Oracle through its January 2010 acquisition of Sun. MySQL continues as open source software, with support and enterprise-level high-performance versions available as commercial options. Other databases, such as MariaDB, have emerged as MySQL work-alikes and have fewer commercial entanglements. MariaDB can be used with Koha instead of MySQL, though some bugs have been identified and resolved. Koha does not function with PostgreSQL or other open source or commercial databases not compatible with MySQL.

Koha has been implemented in a variety of hosting arrangements. Libraries implementing Koha by themselves may opt to use either local server hardware or on instances of Linux in Amazon Web Services or other infrastructure-as-a-service providers. Support vendors can provide services to install and maintain Koha on servers housed in the library, though the most common arrangement involves hosting services deployed on the provider's servers or through public or private cloud infrastructure that the provider provisions and manages for its libraries. Consistent with that of proprietary ILSs, very few new implementations are deployed on local infrastructure but are instead based on some type of vendor hosting arrangement.

Koha is an entirely web-based application, including both patron and staff interfaces. Libraries do not need to install any additional software on desktop or laptop computers nor are any browser plugins needed. Koha was one of the earliest ILSs to rely entirely on web-based interfaces.

Functionality

Koha falls within the general category of software called ILSs in the United States and most parts of the world or library management systems in the United Kingdom. As such, it includes a suite of modules addressing standard areas of functionality, including

cataloging, circulation, acquisitions, serials control, and an online catalog. Consistent with other ILS products, it excels at the management of physical library collections, such as print materials and media collections. Koha does not fit within the genre of library services platforms, which are designed to manage complex collections of electronic resources as well as physical collections.

This section does not attempt to provide a comprehensive checklist or report of the functionality available in Koha. Rather, it gives a general description of Koha's capabilities. Libraries interested in implementing Koha will need to thoroughly review the documentation or contact one of the support organizations.

- **Circulation.** Koha performs all basic tasks associated with the lending and return of materials in the library's collection. Libraries can create sets of loan rules that determine circulation and renewal intervals based on branch location, patron and item types, and other factors. The system supports the concept of floating collections, where items can remain at the branch in which they are returned rather than being automatically routed to their home location. Koha can support both stand-alone libraries and multibranch systems or consortia.
- **Course reserves.** Koha includes a module to support short-term loans for academic courses.
- **Patron record management.** Libraries can define multiple patron categories, each of which can have distinct options for notices and privacy. Koha supports several privacy options for patron circulation data, including anonymization once an item is returned, permanent retention of identifiable circulation data, or anonymization performed at periodic intervals.
- **Cataloging.** Koha includes support for the description of library materials using the MARC bibliographic formats and supporting AACR2 and RDA cataloging rules. Installations of Koha can support both UNIMARC and MARC21 record encodings. Authority control is available for personal names, corporate names, meeting names, uniform titles, geographic names, chronological terms, and genre or form terms. Koha includes the ability to search and retrieve MARC records from external bibliographic sources using its built-in Z39.50 client. Koha also includes a Z39.50 server to provide search and record retrieval for external applications.
- **Serials.** Koha includes features for the management of print serials subscriptions, including the ability to create predictive checkin patterns, route received issues, issue claims for expected issues not received, and initiate or renew subscriptions.
- **Acquisitions.** Koha includes an acquisitions module to manage requests or suggestions, placing and receiving items ordered, managing vendor details, paying invoices, tracking funds and budgets, and claiming materials not received. The system supports EDI for placing orders with vendors electronically and for paying invoices.
- **Online catalog.** Koha provides a web-based online catalog with basic and advanced search options. Record displays can include cover art linked from a variety of sources or subscription services. The search interface includes facets presented on the left side for users to narrow search results, according to availability status, author, library or branch location, item type, subject, series, or other library-defined categories. Results can be sorted according to relevancy, date published, author, title, or call number. Libraries implementing Koha can configure its catalog to display their own logos, branding, or other standard header features.
- **Discovery index.** The online catalog can be integrated with EBSCO Discovery Service to present article-level results from the library's selections of electronic resources interleaved or alongside the materials managed directly within Koha. EBSCO Information Services has provided grants to the Koha community for this functionality and other enhancements of general interest.
- **E-book integration.** Libraries with e-book lending services can integrate the Koha online catalog to present these items along with print materials in search requests, with links to view availability, to download or view, or to add to the hold queue if not available. These e-book integration features are available for OverDrive, bibliotheca CloudLibrary, and many other digital lending services.
- **Self service.** Koha supports the ability to work with self-service lending and return kiosks using the SIP2 protocol.
- **Resource sharing.** Koha can participate in resource-sharing systems using standard protocols such as Z39.50, SRU, NCIP, or SIP2.
- **Language support.** As software used in many different counties, Koha has had strong support dating from its early version to provide translations for its staff and patron interfaces into many different languages.

Satisfaction and Suitability

In the current phase of library technology, open source and proprietary products compete directly on the merits of their functionality, the quality of the support provided, and financial value. Some libraries are drawn to qualities of open source such as the

independence from any specific vendor, its orientation toward community development, and its ability to be customized for local needs. Other libraries choose proprietary products where the vendor takes full responsibility for their ongoing development and support.

Koha has a well-established track record of successful use in libraries spanning over fifteen years. The annual Library Automation Perceptions Survey has been conducted since 2007 to attempt to measure the levels of satisfaction libraries have with their ILSs. Libraries using Koha have given generally positive rankings, though not dramatically different from those given for proprietary products. Figure 2.3 and 2.4 show the satisfaction scores given for Koha regardless of support arrangement and for those libraries using Koha with support from ByWater Solutions. As a point of comparison, figure 2.5 shows the satisfaction scores given by libraries using Library.Solution, a proprietary ILS from the Library Corporation.

Libraries have migrated to Koha from many different incumbent ILSs. It has displaced some of the major products, including SirsiDynix Symphony, SirsiDynix Horizon, Millennium from Innovative Interfaces, Library·Solution from the Library Corporation, Voyager from Ex Libris, and others. The Migration tool on Library Technology Guides provides a detailed report of the products used by libraries prior to migrating to Koha.[8]

Some libraries that have implemented Koha have later migrated to other products. At least thirty-one libraries have migrated from Koha to SirsiDynix Symphony; seventeen from Koha to Innovative's Sierra; forty-three to Apollo from Biblionix (all small to mid-sized public libraries); and ten to OCLC WorldShare Management Services. These numbers do not indicate a major trend away from Koha, but reflect the reality that systems that work well in some libraries prove not to be ideal for others.

There has also been a considerable amount of libraries changing support vendors for their Koha implementations. For example, 180 libraries (268 branches) have shifted from support from LibLime to ByWater Solutions. It is also not uncommon for libraries to contract with a support vendor for their initial implementation and to eventually shift to managing their implementation independently without a service provider.

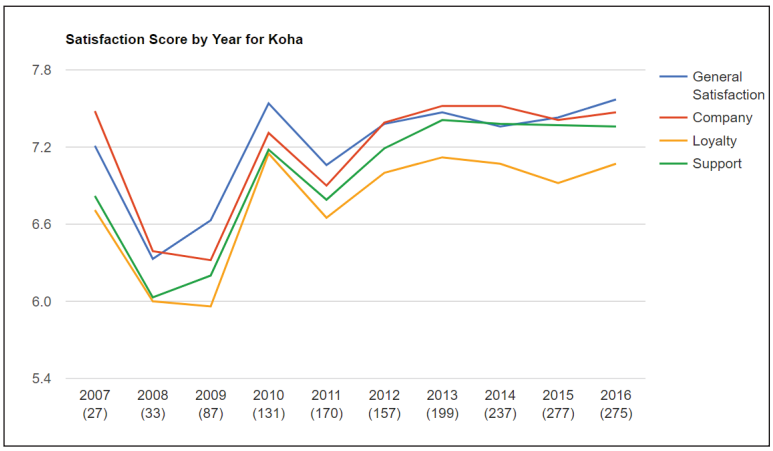

Figure 2.3
Satisfaction score by year for Koha. Source: Marshall Breeding, "Perceptions 2016: An International Survey of Library Automation," Library Technology Guides, January 25, 2017, https://librarytechnology.org/perceptions/2016.

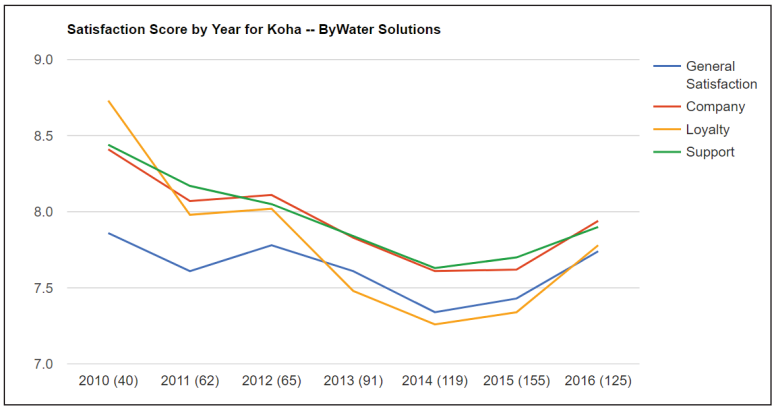

Figure 2.4
Satisfaction score by year for Koha—ByWater Solutions. Source: Marshall Breeding, "Perceptions 2016: An International Survey of Library Automation," Library Technology Guides, January 25, 2017, https://librarytechnology.org/perceptions/2016.

Forecast

Koha has become well established as an open source ILS that has gained considerable functional and technical maturity since its initial version created in 2000. The number of libraries adopting Koha has increased continually. In the developing world, Koha has become the leading ILS product for libraries of all types, including many national initiatives. Going forward, it is reasonable to expect Koha to gain even more ground in the developing world where proprietary products exceed the financial resources available. Apart from financial considerations, Koha's functionality meets the basic needs of libraries in many regions and has excellent facility for language translations. In the United States and Canada, Koha will continue to gain ground as well. In these countries, Koha

can offer a reasonably competitive feature set relative to the proprietary systems, especially for mid-sized public libraries and some academic and school libraries. It seems less likely that Koha will find its way into the large academic and research libraries, especially with FOLIO on the horizon for libraries in that category interested in an open source option. The success of Koha in the United States and other advanced countries is largely driven by commercial service providers able to lower the thresholds of complexity for using an open source product.

Koha Resources

Many resources are available that will be useful to libraries considering or those that have implemented Koha:

- The primary website for Koha: https://koha-community.org.
  - Note that PTFS controls the Koha.org domain and provides access to LibLime Koha, LibLime Enterprise Koha, and the support services it offers.
- Koha documentation: https://koha-community.org/documentation.
- Three mailing lists are maintained:
  - A general discussion list: https://lists.katipo.co.nz/mailman/listinfo/koha.
  - A more technically oriented list for Koha developers: http://lists.koha-community.org/cgi-bin/mailman/listinfo/koha-devel.
  - A Koha discussion list for users in the United States operated by ByWater Solutons: http://koha-us.net/index.php/Koha_US_users_group_listserv.
- The Koha development community communicates through a very active IRC channel: http://irc.koha-community.org/koha.

Notes

1. Index Data, "LibLime Partners with Index Data to Enhance Koha," news release, December 5, 2005, https://librarytechnology.org/document/11708.
2. Marshall Breeding, "Open Source ILS Gains Ground with Academic Libraries," *Smart Libraries Newsletter* 28, no. 2 (February 2008): 1–2, https://journals.ala.org/index.php/sln/issue/viewFile/346/175.
3. LibLime, "LibLime to Acquire Katipo Communications' Koha Division," news release, February 22, 2007, https://librarytechnology.org/document/12428.
4. See also Marshall Breeding, "The Business Side of Open Source: LibLime Buys Koha Div," *Smart Libraries Newsletter* 27, no. 4 (April 2007): 3–4, https://journals.ala.org/index.php/sln/issue/viewIssue/356/165.
5. Search of Libraries.org database, where the country is United States, the library automation system used is Koha—ByWater Solutions, and the library automation system previously installed was Koha—LibLime, accessed June 10, 2017, https://librarytechnology.org/libraries/search.pl?Country=United%20States&ILS=Koha%20--%20ByWater%20Solutions&PreviousILS=Koha%20--%20LibLime.
6. Search of Libraries.org database as of June 2017, where the library automation system used is Koha—ByWater Solutions, https://librarytechnology.org/libraries/search.pl?ILS=Koha%20--%20ByWater%20Solutions.
7. Marshall Breeding, "Koha—ByWater Solutions Implementations by Library Type," Library Technology Guides, Product Directory, accessed June 10, 2017, https://librarytechnology.org/products/type.pl?Product=Koha%20--%20ByWater%20Solutions.
8. Marshall Breeding, "Koha—ByWater Solutions Migration Report," Library Technology Guides, Production Directory, accessed June 10, 2017, https://librarytechnology.org/products/migration.pl?Product=Koha%20--%20ByWater%20Solutions&HQ=on.

Chapter References

Breeding, Marshall. "EBSCO Provides Major Grant to Open Source Koha ILS Project." *Smart Libraries Newsletter* 35, no. 3 (March 2015): 3–5. https://librarytechnology.org/document/20599.

———. "The Open Source ILS: Still Only a Distant Possibility." *Information Technology and Libraries* 21, no. 1 (March 2002): 16–18. https://librarytechnology.org/document/9681.

Proffitt, Brian. "Koha: A Library Checks Out Open Source." (Discussion of Koha at the Nelsonville Public Library.) LinuxPlanet, August 30, 2002. http://www.linuxplanet.com/linuxplanet/reports/4408/1.

Ransom, Joann, with Chris Cormack and Rosalie Blake. "How Hard Can It Be? Developing in Open Source." *Code4Lib Journal*, no. 7 (June 26, 2009), http://journal.code4lib.org/articles/1638.

Willis, Nathan. "Koha Community Squares Off against Commercial Fork." LWN.net, May 5, 2010. https://lwn.net/Articles/386284.