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Developing In-House Digital Tools in Library Spaces: Introduction

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Library service is dependent on the technology tools we use to host, distribute, and control content, our data collection strategies, and user-focused tools that promote discovery and recommendation. Libraries have historically relied on contracted vendors to develop and support these tools, but many libraries are now creating, testing, and supporting their own tools to better suit their particular communities. In response to this trend, many vendors have started offering more responsive platforms outfitted with developer tools to help libraries build these systems out in new ways. This is particularly observable in library management systems like Innovative Interfaces' Sierra and Ex Libris' Alma and discovery tools like Proquest's Summon and the Ebsco Discovery System, and is of course a large part of the appeal for open source software systems such as Koha, Opals, and Evergreen.

As libraries continue to expand their digital collections, online services, and technological offerings, librarians increasingly must rely on new technologies to deliver their content and services. Even as vendors open up APIs and try to adapt their products to suit libraries' evolving needs, existing library technologies and software vendors are not always able to sufficiently or cost-effectively meet these new challenges, and some libraries are turning inward to tackle the development process themselves. This volume seeks to empower librarians to create and develop their own software solutions and technologies, rather than merely implementing existing technology, and is aimed at institutions hoping to put together technology teams or enable existing staff to accomplish in-house technology projects. Some of the case studies and examples are in the very earliest stages of development and may inspire librarians to dip their toes into the world of software development for the first time; other chapters will prove more useful for institutions with existing functional technology teams looking for new projects and collaborations.

For a library to assemble a new functional team or build new tools is not a decision to make lightly; however, as more processes are automated, it may make sense to revisit the day-to-day functioning of the library as well as the roles of library staff. As this volume's chapters from a diverse range of libraries demonstrate,

limitations based on cost, flexibility, and nimbleness are often merely organizational factors that can be overcome with some practical guidance and creative redistribution of resources. Additionally, developing library software in-house or scaffolding from existing open source resources reinforces the core missions and values of many libraries. Not only is it often preferable to customize software to suit library users, rather than shoehorn library services into an existing software product, but libraries are in many ways already the antithesis of proprietary; open source or homegrown technologies are a natural progression for libraries today.

With its detailed case studies of the development process and organizational structures of libraries who have successfully created their own in-house technology solutions, this volume fills a gap in the library technology book market and provides ideas and opportunities for libraries of any kind—public, academic, or highly specialized—looking to expand their existing tools and services. Some of the chapters offer practical guidance to fostering the kinds of environments and organizational structures that allow teams and individuals to accomplish technology projects; by including sections on assessment and the iterative process of development, many chapters could also serve as a benchmark for setting goals and evaluating the effectiveness of library software.

The following chapters represent use cases of libraries that have taken the development process into their own hands, through an internal or outsourced development team creating their own tools from scratch or on top of existing library software. Authors go into detail about the products and their development, including the organizational structure that enabled development and any user feedback or testing; chapters also discuss organizational issues (such as internal and external collaboration and overcoming institutional barriers), examples of library automation, case studies of developing library products, and assessing the impact and usefulness of in-house technologies.

Houda El Mimouni of Drexel University, Jennifer Anderson of Hook & Loop, Nadaleen F Tempelman-Kluit of New York University, and Alexandra Dolan-Mescal of

University of California Riverside provide a clear overview and rationale of applying UX (user experience) methods to library services in “UX Work in Libraries: How (and Why) to Do It.” Their chapter provides some theoretical background on the traditional goal of library user satisfaction and introduces UX as an approach that benefits libraries and their users. It gives an overview of popular UX methodologies and describes real-life UX in libraries through the stories from three librarians in their respective institutions: the New York Public Library, New York University, and University of California, Riverside. Most critically, this chapter provides practical guidance for librarians, whether they are specifically in charge of UX work at their library or aspire to integrate UX into their work on other library services and products.

Susan Chesley Perry and Jessica Waggoner, both from University of California Santa Cruz, also discuss user-centered design in their chapter, “Processes for User-Centered Design and Development: The Omeka Curator Dashboard Project.” Perry and Waggoner provide background and guidance on using an agile project management framework for software development, and offer the development of the Omeka Curator Dashboard as a case study. The University of California, Santa Cruz University Library developed a suite of 15 plugins for the Omeka open source content management system, and this chapter describes the library’s use of agile principles and methods, including the creation of user stories and acceptance criteria, for the management of this project. This chapter also outlines the usability testing conducted by the library in the form of online surveys and moderated field tests, and conclude that user-focused, inclusive, and iterative development are key components to the success of the software development process.

University of Utah’s Harish Maringanti eschews the false dichotomy of “build or buy” when it comes to software products, and instead goes into depth on the myriad options available when implementing new technologies and library systems in the chapter “Software Development in Libraries.” Maringanti focuses on academic libraries in the discussion on the importance of investing in software development in libraries. This chapter also highlights three mini-case studies that demonstrate the wide range of

possibilities of integrating software development in library operations, and offers a non-prescriptive model to assess which projects may be worth pursuing from the software development standpoint.

Dana Haugh of Stony Brook University details the use of mobile app development in libraries in “Mobile Applications for Libraries.” Haugh begins by briefly exploring the history of mobile application development, from its inception and progress to its relevance and use within libraries as a means of improving access and resource delivery for patrons. The prevalence of mobile devices, both inside and outside of the library, has affected the way individuals locate and use information; Haugh argues that because libraries play an essential role in delivering resources to enhance the way users retrieve information, it is therefore important to facilitate learning and scholarship through meaningful experiences across a variety of formats and mediums. Haugh suggests that mobile applications—not just mobile-friendly websites—can appeal to an increasingly digital population of library users in an environment that is both familiar and modern.

Nikola Smolenski, Milena Kostic, and Adam Milorad Sofronijevic from the University of Belgrade describe their digital tool development at the University Library "Svetozar Markovic" in Belgrade, Serbia in “Intrapreneurship and Enterprise 2.0 as grounds for developing in-house digital tools for handling METS/ALTO files at the University Library Belgrade.” The authors work in different roles at the library, which has been aiming at building an efficient, creative work environment over the last decade, and one of the main outcomes of their efforts has been the development of a unique set of digital tools for handling METS/ALTO files. The chapter presents both managerial background and ICT related details that encompass this complex process, and provides examples of best practices in the implementation of Enterprise 2.0. In particular, the library’s successful fostering of intrapreneurship is of great relevance for other libraries. The chapter provides notes on both the specifics of the University Library Belgrade and its organizational relationships, as well as an overview of more general managerial issues and challenges that may be useful for other librarians.

In “Developing In-House Digital Tools: Case Studies from the UMKC School of Law Library,” Ayyoub Ajmi describes his experiences working in the Leon E. Bloch Law Library at the University of Missouri Kansas City School of Law, where he designs and prototypes in-house digital tools to improve communication among internal and external stakeholders. The projects discussed include a custom study room schedule application syncing university calendar to affordable tablets to increase staff productivity, an online data visualization dashboard to help digest large and complex sets of data for better understanding and decision making, and a mobile application to offer students and community an easy access to library resources and services. In addition, the author calls for the need to engage in innovative and experimental practices in libraries by encouraging collaboration with external partners to help develop new services and improve existing ones.

Colleen Bradley-Sanders and Alex Rudshteyn of Brooklyn College explores some of their library’s work in technology development in their chapter “MyLibrary at Brooklyn College: Developing a Suite of Digital Tools.” The Office of Academic Information Technologies (AIT) at Brooklyn College is based in the college library and the authors describe a history of successful innovation in developing in-house digital tools for the use of students, faculty, and the library staff. This chapter is of particular interest to any library operating under tight budgetary restrictions, as the authors argue that developing software solutions in-house has not only been cheaper than purchasing commercial software products, but has also improved services and tailored them to the library’s needs. There is also some discussion of earning income by selling custom tools to other libraries; however, commercialization is not a prime motivator for the creation of the software at Brooklyn College’s AIT department. This chapter explores the development of a set of digital tools called MyLibrary Suite—just one aspect of the work done by AIT—and offers a glimpse into a library with a long and successful history working on technology projects.

Room reservation systems are important in an increasingly collaborative library environment, but can also be technically challenging for all types of libraries to

implement, whether they are using off the shelf vendor products or creating tools from scratch. Stony Brook University's Laura Costello and Shafeek Fazal explore two case studies of libraries experimenting with room-bound, electronic reservation kiosks in "Developing Unique Study Room Reservation Systems: Examples from Teachers College and Stony Brook University." Teachers College, Columbia University built a native app to run on room-coded iPads, while Stony Brook University developed custom code to run Steelcase's RoomWizard system in a university environment. The authors discuss the particularities and challenges of both systems, as well as review a range of potential applications and solutions that have emerged in recent years from other libraries.

Laura Horne-Popp, Elisabeth Bliese Tessone, and Joshua Welker of the University of Central Missouri describe their library's data-driven decision making process in "If You Build It, They Will Come: Creating a Library Statistics Dashboard for Decision-Making." Like many academic libraries throughout the United States, the James C. Kirkpatrick Library at the University of Central Missouri has increasingly documented its impact on the university and its students. The Information Technology Librarian and the Library Assessment Team collaborated to create a library statistics dashboard tool to assist with increased assessment activities. This case study discusses the impetus for developing the tool and provides a detailed explanation of the creation and testing of the dashboard. The chapter also describes the outcomes of using the dashboard tool in the library's assessment activities, along with recommendations for how other libraries may develop similar tools and skills within their organizations.

In "Pulling Content out the Back Door: Creating an Interactive Digital Collections Experience," Amy J Hunsaker, Natasha Majewski, and Laura E Rocke discuss how the University of Nevada Reno is developing a project and assessment-based organization that utilizes applications to increase the discovery of digital collections, enhances the online user experience, supports a growing Digital Humanities measure on campus, and encourages faculty and students to create projects using digital curation and

various existing tools. Part of the chapter describes organizational structuring, such as the hiring of a GeoHumanities Digital Project Specialist and Digital Humanities Historian to create interactive exhibits. The authors describe how ESRI software was employed to create place-based storytelling using digital content held by CONTENTdm, CatDV, and other library platforms. By reimagining how libraries use such tools, this chapter explores new ways of interacting with information to create innovative ways for patrons to re-engage with library collections.

Lastly, Alexandra Lederman and Farah Jindani investigate the possibilities of using digital technologies in an archival setting and describe the development of a community-centered, graffiti-documenting mobile app in “Drips Gallery: A Community-driven Graffiti Library & Archive.” The chapter examines how street art can be preserved and archived through archival websites and mobile applications, and details the development of Drips Gallery, a new archive consisting of graffiti photograph collections that is available through a website and mobile app. The database, website, and mobile app were created, coded, and designed specifically to allow the graffiti art community to drive the direction and scope of the archive. By creating an archival mobile app and website, new and immediate ways of capturing and preserving culture as it is being created and consumed are now possible, and the authors explore how new technologies can shift the role of the archivist away from record keeper towards facilitator.

Libraries are collaborative organizations by nature, whether through traditional resource-sharing initiatives like interlibrary loan or forming consortia to gain leverage and offset operational costs. Developing new or open tools need not be an entirely in-house process; if libraries can identify shared goals and needs, library technology initiatives can grow beyond the individual use case. Neither the trend towards collaboration nor the trend towards homegrown software solutions are likely to abate any time soon, so the next steps in library technology may well represent a convergence of these two ideas. The goal of this volume is not only to foster the formation of new library technology teams, but also to provide a resource so that new

teams may not have to start from scratch with every project. As we move towards open sourcing and using open standards, our tools may be increasingly reusable and interoperable. By offering a comprehensive examination of the structures, environments, and skills that are conducive for successful technology projects—and by featuring case studies from a diverse range of libraries and librarians—this volume proffers to expand the toolkit of the modern librarian and provide a deep dive for libraries interested in developing software or other technology projects.