Leaning Into the Future, Together: Applying Business Process Management to Increase Efficiency and Manage Change in Archives and Special Collections

Jodi Allison-Bunnell, Anne Jenner, and Emily Dominick

The time and resources required to prepare archival collections for use by researchers is a source of constant frustration in archives and libraries. Almost always, aspirations and collections exceed limited resources. The last fifteen to twenty years have seen archivists and librarians putting great effort into increasing standardization and efficiency. However, there are few examples of applying techniques from other fields that are proven to increase productivity. This dual case study shows that applying Lean techniques, which were originally developed for automobile manufacturing, yields significant results: measurable reductions in processing time and resource use; increased adherence to standards; increased engagement in and willingness to change by staff; effective coordination across departments; and increased ability to meet the needs of stakeholders.

Introduction

The time and resources required to prepare archival collections for use by researchers, usually referred to as "processing,"[1] is a source of constant frustration in archives and libraries. Nearly every repository contends with unprocessed backlogs and struggles to meet administrator and donor expectations. All have many aspirations; All have limited resources. Compounding these challenges, they may struggle with staff who resist changes to processes, standards, technologies, and the workplace. Over the last fifteen to twenty years, archives have put great effort into reconsidering processing and making it more efficient. However, the profession has few examples of applying techniques from other fields like business, manufacturing, and engineering that are proven to increase productivity and better match aspirations to resources.

At the University of Washington's Special Collections, starting in 2014, and Montana State University Library's Archives and Special Collections, starting in 2021, they applied a suite of

* *Jodi Allison-Bunnell is Head of Archives and Special Collections and Assistant Professor at Montana State University Library, email: jodi.allisonbunnell@montana.edu; Anne Jenner is Curator of the Pacific Northwest Collection at University of Washington Libraries, email: ajenner@washington.edu; Emily Dominick is Manager, Puget Sound Branch, Washington State Archives, email: emily.dominick@sos.wa.gov.* *©2024 Jodi Allison-Bunnell, Anne Jenner, and Emily Dominick, Attribution-NonCommercial (https://creativecommons.org/licenses/by-nc/4.0/) CC BY-NC.*

techniques from manufacturing called Lean to revise their approaches to processing. They found that this technique applied to their organizations yielded significant results: measurable reductions in processing time and resource use; increased adherence to standards; increased engagement in and willingness to change by staff; effective coordination across departments; and increased ability to meet the needs of their stakeholders. As there are no other published examples of applying Lean in archives, and few on applying related techniques, the authors aim to share the results and to suggest that these techniques can yield similar results for other institutions.

Literature Review and Background

Because Lean is not well known in archives or libraries, a few key concepts and terms will be defined. Lean is a sub-discipline of Business Process Management (BPM),[2] which is "the art and science of overseeing how work is performed in an organization to ensure consistent outcomes and to take advantage of improvement opportunities." BPM focuses on managing "entire chains of events, activities and decisions that ultimately add value to the organization and its customers"; those "chains" are collectively known as "processes."[3] Nearly everything an organization does is a process that enables it to provide products or services for customers or clients. The way that processes are designed and performed in an organization affects both the quality of products or services and the speed at which they are delivered. Lean itself emerged from the 1930 "Toyota Way," which has two pillars for organizational excellence: 1. continuous improvement and 2. respect for people.[4] From the "Toyota Way," James Womack and Daniel Jones defined "Lean" in 1996 as five principles that focus on specifying value for each project, identify how value is created, avoid any interruptions in creating value, let customers pull (identify) value from the producer, and pursue perfection.[5] Lean focuses on the elimination of anything that does not add value to the customer, which is termed "waste."

Lean in Academic Libraries

Even though other methodologies for evaluating workflows from a user-centered perspective are quite common, there are few articles describing applications of BPM in libraries. In their article on implementing Six Sigma (a specific sub-discipline of BPM closely related to Lean) at Sungkyunkwan University Library in South Korea, Dong-Suk Kim observed that at that time (2010), not many academic libraries had applied Six Sigma or similar frameworks to improving their processes. They reported that the process was successful and well suited to the work of academic libraries.[6] Around the same time, Sarah Anne Murphy concluded that libraries benefit significantly from the structures of BPM:

> Libraries can customize and borrow a number of quality management systems and tools from the business community to both assess their service process and continuously improve their operations. By adopting an approach like Lean Six Sigma, a library can respond better to changing customer needs and desires by creating an infrastructure that supports, nurtures, and sustains a culture of assessment and change.[7]

In her 2015 article, Elizabeth Nelson articulates how Lean Six Sigma can be applied in academic libraries and suggests that the most strategic use may be in reducing errors in service and in

increasing service satisfaction.[8] She also observes that these tools have been used to improve technical services workflows, including purchasing and processing books and reducing time needed to re-shelve materials.

Some examples focus on transformative outcomes in customer-facing operations. A case study from the Columbus Metropolitan Library in Ohio has compelling examples of reducing wait times for telephone reference (detailed inquiries of process improvement revealed that using a single button on the phone, not increasing staff, vastly reduced caller wait times) and increasing on-time delivery for internal duplication orders to 100%.[9] The Columbus study, together with another case study from the University of Arizona's interlibrary loan service, provides examples of the ways in which Lean aids in identifying and addressing the root cause(s) of quality deficits and delays.[10] Other examples include using Lean to improve email reference and for general process improvement for a large library system facing dwindling resources.[11]

A book-length treatment of a case study from the University of Maryland's University College examines in detail the application of Lean to managing electronic resources.[12] In that study, Nelson observes that rather than adopting an all-or-nothing approach across the library, these techniques and their many tools and approaches work well when applied to specific processes and scenarios. In most cases, library staff make significant discoveries about the actual origins of waste; challenging assumptions proves to be very powerful. However, Nelson also notes that in some cases, libraries have referred to "process improvement" rather than naming specific methodologies because library employees are naturally suspicious of "managerial names" of techniques from the business world.[13]

The archives literature has just two articles related to BPM, both case studies from Brigham Young University: Gordon Daines' 2014 article (and a closely related 2009 article) on applying BPM to processing workflows. Daines describes applying process modeling to help department staff adopt new practices and workflows around preparing collections. The group had used a project management model but moved to process analysis and revision based on a fundamentally important insight: processing archival collections is not a one-off, unique activity that must be defined anew for each project. Instead, there are so many strong similarities across projects that many aspects of the work should be standardized and done the same way for every collection.[14] Process mapping helped the department visualize and understand how these processes needed to work. It helped the department implement systems well and has driven continued change and adaptation in the organization in the years since.[15]

Why Lean for Archives?

Despite the dearth of specific applications in archives, Lean is closely related to changes in processing workflows and a systematic re-thinking of archival description over the last fifteen to twenty years. That re-thinking, in turn, has two threads: an increasing emphasis on user needs and the reality of scarce resources for processing.

The call to focus on user needs arose in the 1980s with Mary Jo Pugh and Elsie Freeman calling for a reorientation of description toward users.[16] Paul Conway amplified those ideas, suggesting that archives should and could seek out information on user needs.[17] In subsequent decades, the emergence of the term "hidden collections" focused on the most basic user need: easily discovering where collections were held. In discussions between

1998 and 2008, stakeholders asserted that outdated practices for cataloging and processing collections for use were a major factor in creating unacceptable backlogs and lack of access to collections.[18] Following on these findings, the Council on Library and Information Resources (CLIR) launched the Cataloging Hidden Collections regrant program in 2008. That program, which continued until 2014, focused on developing and implementing efficient practices—including collection-level description, re-use of finding aid data, using slightly augmented accession records for public access—to challenge traditional notions of processing.[19] It formed a strong underpinning for the CLIR regrant program that continues today: Digitizing Hidden Collections.[20]

Closely related, and driving the promulgation of revised practices, was Greene and Meissner's seminal 2005 article "More Product, Less Process."[21] Their work was transformative because it redefined processes based on documented needs of end users, eliminating work that was tangential to the needs of those users. Their work is thus consonant with the Lean concept of letting the customer pull value from the provider.

Other essential works and standards are consistent with this strategic focus on end users. In its introductory principles, Describing Archives: A Content Standard (DACS) version 2019.0.3.1 states:

> Because it facilitates use, archival description is a user-centered product and process.… It is imperative that repositories identify, engage, and seek to understand the motivations and needs of their users, which may include but are not limited to scholarly production, collection care and control, institutional knowledge, connection to family ties, artistic endeavors, government accountability, justice-seeking endeavors, and symbolic purposes of holding records.[22]

DACS also states that description beyond the minimum should at all times be user-driven. At this point, the profession can leave behind any idea of slavishly following old procedures and the notion of "the right way," without giving thought to the functional and real requirements of users.

More recently, OCLC Research's Total Cost of Stewardship report (TCS) moves beyond the focus on reducing backlogs that is part of the "hidden collections" concept to provide means to potentially prevent the accumulation of backlogs in the first place. By addressing the organizational gap that often exists between collection development and collection stewardship, it is part of an overall trend to strategically re-focus the work of archivists, librarians, and other cultural heritage professionals.[23] It provides a toolkit for estimating and articulating the total cost of stewarding collections throughout their lifecycle so that repositories can better match ambitions with available resources.

Even with all of these advances, institutions and their staff continue to struggle with processes and tools that may not be producing the results they and their users need. It can be difficult to help individuals and teams understand where established practices are or are not beneficial. As a grassroots process that fundamentally respects the individuals that do the work, Lean and other structures like it can help individuals (and thus organizations) to see past personalities, territories, and incidents or conditions long past to develop new and more effective approaches to collection preparation.

Case Studies

University of Washington

Background

The University of Washington is the flagship institution of six public universities in Washington state and includes one of the largest library systems in the world. Special Collections is situated on the Seattle campus of the University in the Suzzallo & Allen Library. Holdings in Special Collections include over 70,000 cubic feet of archival collections and nearly 200,000 non-circulating titles.[24]

The division has seen a steady reduction in the number of staff over the last two decades, but the volume of acquisitions has increased, creating a notable imbalance of acquisitions and resources. Their current staff structure is the result of a merger of Manuscripts & University Archives with Special Collections in 2000, forming a single division named Special Collections. Merging the two service desks into one resulted in reduced staffing. The 2008 recession further reduced staff numbers, including three key technical services positions, the Head of Special Collections Technical Services, the Processing Specialist, and eventually an Accessioning Specialist.[25] The backlog of un-accessioned and unprocessed collections grew. When the economy recovered, Special Collections hired more curatorial staff positions but did not fill vacant Technical Services positions.[26] Seven curators acquired collections without shared collection development goals or awareness of Technical Services capacity to handle the quantity of acquisitions. The backlog continued to grow and conversations regularly ended in frustration because of ineffective accessioning and processing systems. Technical Services staffing declined through attrition and by 2012 it consisted of two part-time accessioning staff members with on-the-job training in collections management and one full-time computer/database support staff member. In the absence of a Head of Technical Services, the University Archivist supervised this three member team. Collections work—accessioning, processing, collection records maintenance, and finding aid[27] changes—was activated and tracked with paper forms, but each curator used the forms differently. The lack of standard practices was confusing and caused rifts among staff and between departments. While they agreed on the key steps of the accessioning process (acquisition, logging collections information, preparing materials for the storage and access, and creating and uploading the Encoded Archival Description [*EAD*] finding aid), they could not agree on who was responsible for each step. Curators were aware that they had developed distinct accessioning workflows and standards but were unsure of a way to resolve the differences.

Special Collections learned that the University Records Management Services department went through a Lean process improvement exercise and successfully developed more efficient work processes. Hoping that they could have similar success, the curators and Special Collections leadership turned to the University of Washington's Lean Process, a program managed loosely through the university's Finance and Facilities Department. The university supported the Lean Process by providing a gathering space for Lean launches, a Lean facilitator, and organizational assistance. They were assigned a facilitator from a corps of University of Washington volunteers who guide other departments through their Lean redesigns. Their facilitator was a staff member from the University Records Center who held a library degree and understood some aspects of their work. Her primary role was to give them direction, keep them focused on particular tasks, lead them to key milestones, and then step back so they could do the work.

The Lean Redesign

PROJECT SCOPE

Once they decided to take the Lean leap, key team members met with their facilitator to begin working on a scope statement. That statement stated the problem they wanted to solve:

> There is a large and steadily growing backlog of un-accessioned acquisitions, and the current accessioning process is cumbersome and prone to stalling. Staff have differing understanding and expectations of what work is to be done during accessioning, by whom, and when.

The Statement connected the Lean effort to the unit's organizational goals: to make materials discoverable by and accessible to the researchers, and to be accountable to its donors.

The Statement focused on three areas of accessioning:

1. Identifying necessary, unnecessary, and desirable elements in the accessioning process;
2. Eliminating stall points to make time-to-completion predictable;
3. Reducing the accessioning backlog month to month.

Success was defined as:

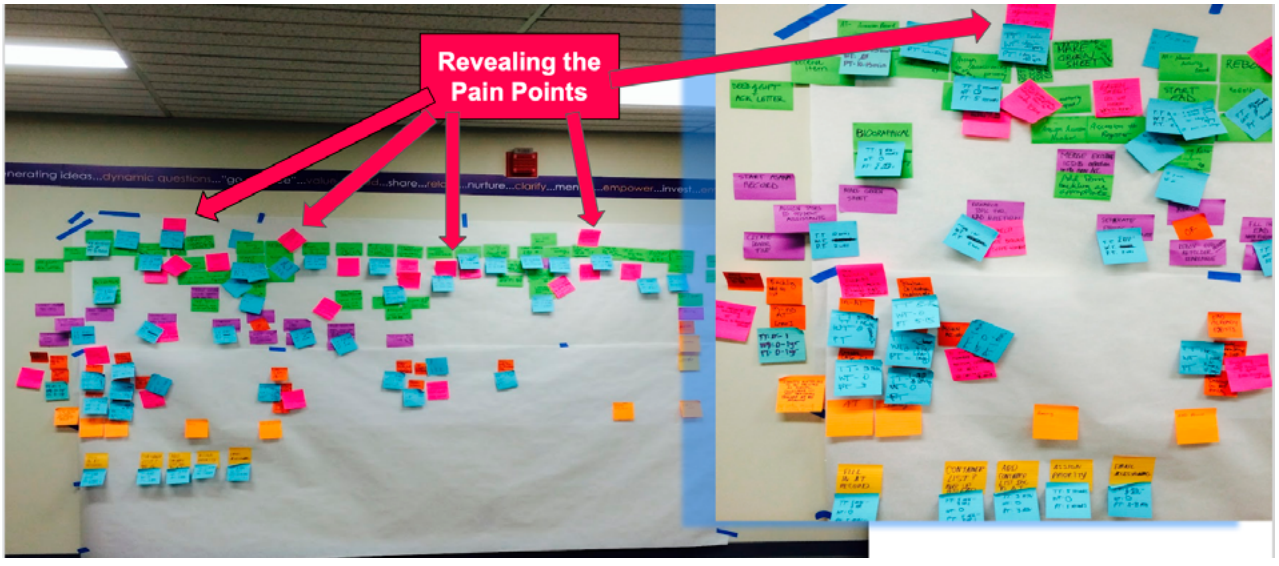
1. Producing a revised accessioning manual;
2. Reducing the time needed to move materials from intake to completion;
3. Regular monitoring of backlog numbers shows a reduction in size.

The scope statement also listed the team members who would gather for a collaborative three-day Lean launch. The ten-member Lean team consisted of curators (archivists and librarians), Technical Services staff, and the director of Special Collections. Aside from the director, every person on the team was directly involved in some way with the accessioning process.

CURRENT STATE

The University of Washington provided an ideal space for their Lean launch: It was across campus and away from the library; had rolling office furniture to quickly gather, disperse,

FIGURE 1
Documenting the Current State



and re-convene; and had blank walls to cover with butcher paper and sticky notes of all sizes and colors. The team began documenting the current state with sticky notes on the wall, mapping the accessioning process from the beginning (when the new acquisition is delivered to the workroom) to the end, (when the collection is staged for shelving). The intervening steps included logging preliminary information about the new accession into the collection management database, rehousing the collection if needed, creating or updating an EAD finding aid, creating or updating catalog records and authority records, and locating an appropriate storage location.

FINDING PAIN POINTS

By mapping their processes in detail, they revealed a workflow with 86 steps, 26 stall points, process times ranging from 77 to 466 hours of touch time; 88 to 244,131 hours of process time; and 33 to 130,482 hours of wait time. They identified and addressed 31 ideas for improvement as they tweaked the process. They also found four shortcuts or "ghost processes" that staff developed to overcome accessioning barriers. One example: incoming visual materials collections were temporarily staged on shelves apart from other materials awaiting accessioning. These collections were recorded and tracked in a spreadsheet accessible only to the visual materials curator and kept in that state for an undetermined period of time because the accessioning staff were unable to allocate sufficient time to address the materials.

FUTURE STATE AND INITIAL REDESIGN

The team's next focus was envisioning a future state. Here, they faced a challenge: focusing on the "happy path" of finding a workflow for the 80% (the *most common* situations) while accepting that *less common* situations will make up the remaining 20%. Their second challenge was to set a goal for improvement. The Lean facilitator urged them to make an audacious goal: a 50% improvement. To fulfill this goal, they would need to dismantle current processes and build a common workflow that worked for every member of the team. The process stopped from time to time for the team to step back and resolve disputed perspectives or settle on a shared definition of terms, like, "what is the definition of accessioning or hand-off?" Unresolvable issues were added to a list of projects to address back at the shop.

They also developed a larger goal: to continue to pursue the ideal future state. They understood that the team would remain empowered to implement improvements and make their work lives better and their communication smoother, while also receiving support from leadership for their efforts. The Lean process is more than a set of tools and techniques. It is meant to have lasting organizational impact by building a culture where staff identify and fix problems collectively, work with a sense of urgency, purpose and teamwork, think creatively, learn, grow, and share lessons learned with others.

NEW PROCESSES THROUGH KAIZENS

The Lean launch concluded with the framework of a single common accessioning workflow and four kaizens. Kaizens are simply short-term projects undertaken by a subset of the team with the aim of improving one element or aspect of the overall process. They are designed with an expectation of group-wide report-outs at 30, 60, and 90 days. The team agreed to complete four kaizens:

1. Flesh out Future Process: The entire team would work together toward a goal to resolve 26 pain points and test the new common workflow.

2. Create Queue Management: Three team members would test electronic tools to replace paper forms and make a recommendation to the team.
3. Address Backlog: Three team members researched and documented backlogs and established new norms for recording incoming acquisitions to facilitate discoverability and prevent the backlog from increasing.
4. Space Management: Three team members examined storage capacity to prepare for space challenges.

After committing to a new common workflow, the team overhauled their pre-Lean accessioning manual. The new manual was designed as a living document to be continually updated with efficiencies as they were developed and adopted. Eighty-six steps in the workflow were reduced as practices were consolidated using shared project management software, while paper accessioning forms and other redundancies were eliminated. Upon eliminating paper forms, they turned to managing the accessioning queue with Asana project management software. As a web-based system accessible to every member of the staff, Asana allowed them to track each collection through the workflow with transparency and improved command over the workflow. Like many project management tools, Asana's templates and task lists can include mandatory and optional steps as the workflow requires. The templates ensured consistent processes for all curators while allowing each person to assign tasks to colleagues or to student assistants on their teams. Using Asana created consistency but also still allowed for flexibility.

To address the backlog and prevent new backlogs from accumulating, Kaizen 3 examined each curator's undocumented or alternately documented collections. They identified the minimum level of work needed to record materials in the collections management and project management databases and provided training and coaching to adopt the new practices. They suggested approaches to continuously monitor activities aimed at reducing and eliminating the backlog.

Kaizen 4 members researched the current spaces and space management databases. The work prepared the team for an eventual shelf reading project and a revamp of the existing database that tracks space availability.

Beyond the four kaizens, the team immediately adopted different and more productive ways to work together. Daily "huddles" (also known as stand-up meetings) began the day they returned to the office after the Lean launch. They committed to weekly one-hour meetings to track progress and followed through on kaizens and their 30, 60, and 90 report outs. During daily huddles and weekly meetings, they refined their approaches to complete tasks and negotiated changes in their collective workflow. Rather than selecting one or more test projects, they simply applied the new processes to all the work. As a relatively large organization, they receive new collections weekly if not daily. Incoming collections, along with the identified backlog, were excellent test cases for the improved process.

Results

Quality

Team communication improved right away with daily huddles, weekly meetings, and shared goals and continued to improve with the addition of project management software and a revised accessioning manual. Having one queue for accessioning that was available and visible to all team members immediately cut out the problems created by shadow systems. Curators could trust that their collections were being addressed and successfully churned through the

workflow. Accessioning was now commonly understood to be a series of discrete steps agreed upon by the entire team, Bottlenecks that inevitably cropped up were brought to a huddle or the longer weekly meeting.

Quantity

Measuring quantitative improvements is often the driving force behind implementing the Lean process, because better numbers can be equated with cost savings by management. Common metrics to consider are the time-to-completion, the number of completed accessions per week/month, the number of workflow stall points, and quantifying and reducing the backlog of unaccessioned collections. The scope document was vague on some of these points. The team aspired to "improve the accessioning process to eliminate stall points and make time to completion predictable," and "to continuously reduce the backlog month to month." Even with this lack of clarity, it did not take long for the new accessioning system to show marked quantitative improvements in productivity. The number of accessions completed doubled in the first year, from about 150 accessions completed to more than 300.

Relationships

Although the quantitative improvements were impressive, the team improved qualitatively, as well. They found it easier to communicate and build stronger working relationships. Because Lean focuses on the process instead of the person doing the work, Lean was a key factor in that change. Each team member's voice and perspective had equal value in building workflows, tracking progress, and implementing changes. Each curator had equal access to technical services, common communication tools, and a commitment to using shared standards.

Lean requires willing participants across the board. Some team members were not ready or willing to make changes. Although the team determined it necessary for Technical Services staff to work full-time, two part-time accessioning staff members did not want to increase their hours. Feeling no longer suited to the work, both opted to retire. The team adapted and hired a full-time Technical Services Archivist a year after the Lean launch. She was charged with managing the workflow, leading daily huddles and weekly hour-long meetings. With a functioning common workflow, she could move collections from the hands of curators through the accessioning process and make them ready for researchers. The Technical Services Archivist was a neutral position on equal footing with all curators.

The success of this new approach to queue management prompted them to use tracking systems within other areas of their library work, such as using the library management system Alma to barcode archival materials. Barcoding allowed for location information on a per-item basis to be centrally tracked, which prepared the collections for eventual circulation to the reading room. It also enabled them to track materials that were routed from the department to Preservation for treatments or to curators for exhibits. They added partners from the Preservation and Cataloging departments to their Asana workspace so they could also participate in the workflow.

They grew confident enough with the Lean process that they held subsequent Lean launches to redesign their digital collections accessioning and processing and to manage the cross departmental work of Special Collections library materials acquisitions and cataloging. While these Lean processes were helpful, they did not work with the outside facilitator or do the full three-day redesign, and therefore saw less success and impact than they did with

the first Lean process. Neutral facilitation, support, and substantial time away from the shop to build new processes are important elements of success in the Lean redesign experience.

Montana State University

Background

The Archives and Special Collections (ASC) department of the Montana State University Library has significant primary and secondary source materials in its focus areas.[28] With significant recent acquisitions, the department has a strong mandate from library administration to continue to build its collections.[29] The library hired a new department head in 2020 to lead two and one-half paraprofessionals (Curator, Archives Technician, and Digital Production Manager) and four full-time faculty librarians (Special Collections Librarian, Data Librarian, Outreach and Humanities Librarian, and Archivist).

Like their peer institutions, they face constraints on their ability to efficiently and promptly prepare new acquisitions of unique materials—archival, bibliographic, digital, or a mix—for use by researchers. Before 2020, processing was done primarily by the Curator, the Head of Special Collections, and occasional temporary faculty, staff, or interns. Workflows developed within each of those positions with little coordination or knowledge of those workflows by the remainder of the department members. Processing techniques, though very solid from a traditional standpoint, were centered on manually producing HTML and EAD finding aids and MARC records. Accession records and locations were managed in an aging ProCite database that was inaccessible to all but the department head and the curator.[30] In general, the department operated very separately from the rest of the organization.

Preparation of collections for use in analog or digital form also involves not only ASC, but also Digital Library Initiatives (DLI) and Cataloging, Access and Technical Services (CATS). CATS does subject analysis and name authority work for EAD and MARC records; creates metadata for digital collections; and advises on metadata structures for description and management. DLI builds and maintains the library's digital collections; manages in-house and outsourced digitization with ASC; and oversees technical infrastructure for the library that includes the digital collections system. While the working relationships among the three departments were reasonably good, there were few routine processes established for collection processing. Instead, each project was treated as unique, with little clarity about who initiated and oversaw projects; whether digital projects and metadata were part of routine work or were an "extra"; and who was empowered to determine or adjust timelines and deadlines. Each time a project transitioned from one department to another, individuals had to schedule meetings in order to discuss next steps. Frequently, projects would stall for weeks or months because they were handed off to the wrong person or because individuals lacked adequate information to do the next step in a project. Project documentation was uneven, requiring repeated decision making and making it difficult to declare successful outcomes because not everyone agreed on end products. Re-starting stalled projects took time and fueled frustration between departments and individuals, and library administration often had to get involved to satisfy promises made to stakeholders.

The combination of all of these factors resulted in great difficulty predicting processing times and introduced difficulties for both staff and collection donors. Without predictability, making promises to donors about the availability of their materials was risky and tended to create unsustainable timelines and overwork. For instance, processing and digitizing the

initial deposit of the Ivan Doig papers resulted in significant stress and overwork even as it produced an opportunity for library staff to meet a new challenge and exposed the library's premier literary collection.[31]

ASC staff, their colleagues in CATS and DLI, and library administration were dissatisfied with the status quo and were ready to find a way to distribute processing among existing positions, promote high-quality standards compliant work, support coordinated teamwork within ASC and across the organization, and enable better awareness of capacity. Luckily, they had several key components in place that made success more likely based on Lean in Higher Education expert William Balzer's measures: Desire to change that aligned with the library's strategic plan and its support for employee development and continuous improvement; department leadership change that brought new communication practices; and an acknowledgement of and support for needed changes in position descriptions.[32]

Inspired by their colleagues at the University of Washington, who presented about their Lean redesign at a Northwest Archivists meeting in 2016,[33] they conducted a Lean redesign in 2020–2021. The staff of ASC, along with eight colleagues from DLI and CATS, planned and carried out the redesign, and the Head of Archives and Special Collections was the project director. A Faculty Excellence Grant from Montana State University's Office of the Provost funded Lean consultants Irene Mauch (The Mauch Group) and Megan Mozina (Cresta Solutions) (hereafter Mauch/Mozina) to facilitate the process.[34]

The Lean Redesign

PROJECT SCOPE

Mauch/Mozina facilitated a series of whole-group and small-group workshops in March-June 2021 to introduce the team to the Lean methodology and to define the breadth and depth of the project, the roles and responsibilities, and the end user's value proposition; to analyze current state, gaps, and opportunities; to create a high-level implementation plan; to frame the new process tools; and to provide post event coaching and support. They worked with library administration, the project director, and the CATS and DLI department heads to develop a high-level understanding of the need for the project, define the project charter, and help the redesign team engage with and commit to the project.[35] Because this redesign was conducted during the COVID-19 pandemic, it was done entirely online.

CURRENT STATE AND PAIN POINTS

Like their Washington colleagues, they began by defining the customer, the customer's needs, and then mapping the current state. Mauch/Mozina led the entire group in creating an overview of all the steps involved in preparing a collection (archival, bibliographic, digital, or all three) for use by researchers, from intake to availability. In additional small group sessions, team members described each part of the process in detail. Other team members asked questions to clarify meaning, challenged some assertions, and looked for missing pieces. During these sessions, individuals were more able to describe a single process in detail than they were to participate in a group description of a series of processes, so a rewarding by-product was that participants and departments learned a great deal from one another. Team members struggled to describe all the processes at a similar level (e.g. how do we label boxes? How do we find space on the shelves? How do we decide what level of processing to apply?). Individuals were challenged to describe the most common

scenarios—the 80% rather than the 20%—and required support to redirect their thinking from unusual situations to more routine ones. The project director checked in with individuals throughout the current state workshops and found that individuals reported that the workshops were positive and that they were learning a great deal from one another. For most team members, the current state map was the first time they saw the process from end to end. The current state was documented, and seventy-five pain points were identified where the current processes were not working well. Because this was an overwhelming list that could not be addressed in a single redesign, the list was narrowed to sixteen items that ranged in scope from identifying department roles and responsibilities to a standardized process for labeling boxes.

SMALL GROUPS ON PAIN POINTS

The next phase of the redesign was to address the identified problems. They created sixteen small project groups of varying sizes according to topic and group members' strengths and expertise. (These projects were kaizen events, though that term was not used.) Over the course of two weeks, each group examined the pain point, identified an approach to relieve the pain, outlined the steps needed, and produced a draft of the essential elements of a new approach. Each group met with Mauch/Cresta for support, coaching, and coordination with the project as a whole.[36] They also formed a coordination group (composed of the project director, CATS and DLI department heads, and the Digital Production Manager) that met frequently during the two weeks that the small groups were working to integrate that work into the main flowchart, to observe where groups or individuals needed additional support, and to consider new issues as they emerged.

During the future state planning OCLC Research released its TCS report and tools at precisely the moment that the team needed them. Specifically, they adopted the project plans for archival, bibliographic, and digital as well as the quick cost calculator. With well-considered and field-tested models for collections consideration, project plans, and calculating capacity, the team was able to create stronger processes.

REDESIGN CLOSE

At the end of the small group work, the project had drafts of new practices that addressed critical pain points, a revised overall flowchart, and a clear sense of where to adopt the existing tools from the TCS Toolkit. Mauch/Cresta met with the entire team to show the revised flowchart and how the mini-projects fit in and how they laid the groundwork for continuously testing and revising processes. They also met with library administration to show the results to date, to emphasize the critical role that executive support plays in a successful redesign, and to clarify that the team needed to focus considerable energy on implementation for the coming four months with minimal distractions.[37] This represented the end of Mauch/Cresta's direct work on the redesign. The redesign coordination group became the Cross-Functional Group (CFG), responsible for identifying and managing capacity and the preparation of all unique collections—archival, bibliographic, digital, or a mix—for use by researchers. This group now meets twice a week for 10-30 minutes to provide consistent oversight for all current and upcoming projects.[38] They also established the Technical Review Committee (TRC), which meets weekly to plan and carry out digital projects specifically. The Digital Production Manager serves on the CFG and leads the TRC.

PROTOTYPING TOOLS

Lean relies heavily on trying new processes, rapidly assessing how well they work, and making revisions—all of which enable continuous improvement. The team emerged from future state planning with workflows and tools that were deliberately in draft form so they could make changes before they were over-invested in particular approaches. The first month of implementation consisted of taking the tools that were in draft form and refining them to a usable state. Members of the CFG met with the individuals who worked on the mini-projects by workflow (archival, bibliographic, digital) to step through the workflows and tools in detail so that the group members could clearly understand how each tool functions in the greater whole and could see the gaps between the draft form of each and a form ready for implementation. The CFG prioritized the tools most critical to all processes along with those in the most incomplete form.

The whole team met again for a workflow-specific review of the flowchart, a view of the draft project tracker, and articulation of plans for training for both small groups and the whole team. They celebrated the work done during the first month of implementation and recognized groups and individuals for their contributions. During that meeting, they reinforced the idea of prototyping the new processes and documentation and making notes on needed changes in a shared document rather than getting caught up in details. This is an essential underpinning for continuous improvement in the short and long term.

IMPLEMENTATION: TEST PROJECTS

With those tools and mindset in hand, the team moved to test projects, each of which used one or more specific components created during the redesign. All of them also tested the overall workflows and structure for project planning and tracking and were the focus of all the work; other collection preparation stopped in order to fully embrace the new processes. Over the course of three months, the team completed one archival, one bibliographic, and the end of two digital projects.[39] The two digital projects proceeded smoothly with clear project plans, templates for metadata, and project tracking. The bibliographic project enabled student assistants to accurately search the library's catalog to identify duplicate and unique items which addressed a major pain point for the CATS department. The archival project tested the use of a number of components, including inventory spreadsheets for import into ArchivesSpace, exporting MARC records from ArchivesSpace, and using digital-on-arrival processes.

Results

After these test projects were completed, the project director and all involved staff conducted a review of the initial implementation. Persons involved in each workflow met as a group to step through the process and note where there was insufficient information, missing steps, or flaws in the tools. The review processes uncovered elements that needed improvement, specifically the project tracker, specific uses of ArchivesSpace, and the review of digital collections. Also marked for discussion was initial curation of bibliographic collections and whether unnecessarily complex processes had been implemented. Small groups then made changes and improvements to the tools and processes.

During the review period, the project director also met individually with all involved individuals for 30-minute structured interviews. Interview questions addressed the experiences of each individual and areas of change or continuity in both their work and the work of

the organization (See Appendix B for questions). The project director took notes during each interview, invited every participant to review and correct those notes, summarized both the interview notes and the workflow-specific sessions, and performed analysis of keywords and themes. The summary was shared with and discussed by all Lean participants in a celebration, and with the entire organization in an all-staff meeting.

FIGURE 2
Word Cloud of Summary Notes, 2021 December

Quality

Participants reported that the work completed during the test projects was more consistent and of higher quality. Project plans meant that the overall information on a project was easily available, and decisions were made just once rather than several times. Because individuals had clear roles in the processes, their work felt more relevant and appreciated. And even though work stopped on other projects in order to focus on and measure the results of the test projects, the quality of the test projects meant that the overall impacts were positive.

Quantity

At this stage of the project, there was still insufficient data to assess whether the new processes increased the quantity of collections that could be prepared for researchers. Considering they went from having no idea how long work took to having some means to estimate it through the TCS toolkit, it is an improvement, nonetheless. With the new processes, participants stated that the work felt faster because of having increased clarity and fewer bottlenecks. Continued data collection will show whether this perception is quantitatively supportable.

Relationships

Improvements in quantity and quality were important, but somewhat unsurprising. The most significant change seen in the initial implementation was in relationships. The keywords

used most frequently during the interviews described increased understanding, collaboration, clarity, communication, and transparency. Participants reported an increased sense of responsibility toward one another, and an increased sense that all roles are clear and valued. They reflected that ASC is much more connected and integrated with the rest of the organization, rather than operating as a distinct and siloed entity. Several participants discussed the experience of talking openly about the pain points, which they felt were previously taboo in the organization, and expressed gratitude and support for being encouraged to have these discussions and to seek solutions together

Discussion

The Lean redesign processes at the University of Washington and Montana State University occurred at very different organizations and more than five years apart. However, both processes share some common themes: collections stewardship, the function of standards compliance, and fomenting and sustaining organizational change. For both organizations, having permission to discuss pain points was not only needed, but was an entryway to creating solutions. In both cases, the Lean redesign resulted in significant positive outcomes along with challenges that should inform similar projects at other institutions.

Stewardship

Both institutions faced slightly different versions of the same challenge: responsible stewardship. For the University of Washington, a backlog of material lacking even basic metadata meant that a large number of collections were completely inaccessible. Montana State University lacked the same degree of backlog, but was challenged to meet donor and administrative expectations without either making promises that could not be fulfilled or keeping promises while significantly overtaxing library staff. As the TCS report observes,

> Archives and special collections are charged with collecting materials that document our society and its institutions as well as with the ongoing, responsible stewardship of these records. Yet many archives and special collections struggle to manage the volume of materials under their care. Accumulations of inaccessible, poorly described collections and inadequately preserved materials can create a breach of the trust we hold with collection donors and users. Matching collecting activities to resources is fundamental to stewardship.[40]

The TCS authors also observe that archives and special collections have given significant focus to reducing backlogs and preparing collections more efficiently. They propose a new approach that uses a constraint model for collecting so that libraries collect within their capacity and make promises to stakeholders that they can keep.[41] That model builds on existing efficiencies and adds a measured approach to calculating and communicating capacity. These experiences suggest that processes redesigned using Lean support both approaches. The Lean redesign at the University of Washington fit, chronologically and theoretically, into the "increase efficiency" trend. It fulfilled that goal: quantitative measures showed a marked increase in the number of collections accessioned each year. The redesign at Montana State University, with its twin focus on increasing efficiency *and* understanding and articulating capacity for preparing new collections, was parallel with the framework of TCS and "responsible stewardship." While

the quantitative data is still emerging, the improved communication lays firm groundwork for responsible stewardship.

However, the calculation and communication tools provided by the TCS toolkit are just one part of responsible stewardship. The other part, which both institutions confronted, is creating and supporting a team rather than an individualistic approach to special collections work. University of Washington Lean team members were not unanimous in their support for the process. Some reluctantly participated, convinced that their voice would not be heard. The Lean process is designed to address this issue: team members incrementally and collectively document the current state and imagine the future state point by point and moving forward only when all are in agreement, turning the skeptic into a big supporter of the process. For Montana State University, departments and individuals had no real understanding of how the library prepared unique collections for use. Lean current state process mapping helped every member of the team understand where their work fit in. One team member observed, "every piece of this flowchart represents a promise that we make to one another."[42]

Standards Compliance

The "special" in "special collections" meant, for decades, unique approaches for processing every collection; it is a legacy of the profession that is difficult to move past.[43] The emergence of DACS as a descriptive standard just eighteen years ago counters that legacy. With the developments of the last twenty years—EAD, DACS, standardized rights statements, and all of the advances in name authority work including the Virtual International Authority File (VIAF) and Social Networks and Archival Context (SNAC)—practitioners in unique collections increasingly understand and see both the advantages of standardization and the limitations of customization. Both institutions used Lean processes to significantly enhance their ability to create consistent metadata for use and re-use and to move that metadata through systems.

For MSU, standardization was one approach to relieving pain points uncovered during the Lean redesign. These changes—metadata templates for digital collections, ensuring that bibliographic searching was done consistently by student assistants, clearly defining levels of physical processing for archival collections—made immediate and tangible differences in how the work was done. They represent a move from a completely customized process to one with the right level of routine and room for appropriate customization. However, this change was difficult: for some staff, standardization felt like moving toward a "cookie cutter" process. The current state mapping process provided an opportunity for the project leader and the consultants to key in on individuals' expertise and perspectives and to carefully consider how to draw on it to create balanced approaches.

For both institutions, revising processes also included ensuring that the metadata created during them was both consistent across the organization and compliant with national standards. Inherent to the process was engaging the role of accessioning in establishing consistent bibliographic control. For the University of Washington, the Lean process forced a reckoning about the meaning of accessioning—once everyone agreed on the definition and what they wanted out of the process, it was easier to move forward and engineer the process to check all of the boxes. They realized they wanted each accession to have at least a minimum level of description. They identified all of the fields in their collection management software that were essential at each level of the process. In some cases these fields corresponded to fields that would be displayed in their finding aid and their MARC record (the outward facing mani-

festations of the invisible accessioning work). In this way they baked standards compliance into their everyday expectations of what accessioning is and always strove for the "golden minimum." They agreed that all accessions would be made discoverable by the end of the accessioning process whether or not any detailed processing had been done or was planned. They embraced the "accessioning as processing" framework out of necessity.[44]

For Montana State University, the Lean process established a clear practice of doing fully standards-compliant minimal description on accessioning, and in ArchivesSpace, so that the metadata could be re-used for as many outputs as possible: EAD finding aid, MARC record, digital collections metadata, and a variety of administrative reports, including those for donors. This eliminated both tedious cut-and-paste work across multiple systems and the re-creation (often in different forms) of metadata for those outputs. For ASC staff members, learning and practicing standards-compliant basic description was a hurdle but ultimately achievable for most.

Managing Change

Fundamentally, Lean redesign is about people embracing the changes they identified, implementing the solution they have formulated, and tracking progress toward goals they have established. It is a bottom-up, grassroots process that respects the people who do the work. This makes it a powerful approach to creating and sustaining change in an organization, so long as there is also continuous support and expectations for sustaining new processes. Absent that support, new processes will lose steam.

At the University of Washington, the Lean process was supported through their department administration and encouraged in general at the University.[45] Within this context, each team member was expected to be motivated to participate and commit to new and more efficient practices. They learned from their facilitator that it is common for team members to not find themselves in the new work, so the retirements of the accessioning staff were unsurprising. The changes also set up the new Technical Services Archivist for success: they joined an already motivated group that had adopted new processes and wanted to continue to improve them.

However, over time enthusiasm waned for the idea of continuous improvement at the University of Washington. Some staff were, if not resistant then, more likely to fixate on the extra effort to master new tools and less committed to a common workflow. In the end, a uniform workflow was not adopted by all curators. The director did not manage the process, failing to insist on the need for adherence to common/shared practices and workflows and failing to assign the authority to enforce it to another person in the department.

At Montana State University, the project director and Mauch/Cresta closely monitored the level of engagement and skills evidenced by members of the team throughout the process. Some individuals were expected to be strong contributors to this work, either directly by contributing knowledge of specific processes or more indirectly by asking questions of colleagues. Some individuals emerged as strong contributors unexpectedly, proving themselves strong systems thinkers and reliable collaborators. Some demonstrated that they were less engaged by not following agreed-on project norms or contributing to discussions. And some individuals had struggled more than others to articulate how work might be done differently and why. Sharing these observations allowed the project director and Mauch/Mozina to shape individuals' places in the project and identify both those who could contribute a great deal, those who were likely to contribute more to very specific topics, and those who would need

additional support and encouragement to contribute well.

One of the roles the strong contributors began to play was to provide peer support. A few team members expressed concern that the new processes were overkill, and that they were documenting and planning at the expense of actually accomplishing the work. This is a reasonable concern and a reflection of what a profound change this was. This type of skepticism can emerge because it is hard for people to see how the work they do fits into the process: they are simply doing the work in the way that seems best to them, sometimes in the way that is most expedient or convenient. Stepping through the Lean process enhanced everyone's understanding of how and why their work impacts others. For example, a new process at Montana State University ensured that donated bibliographic materials were accurately searched in the ILS before being selected for the collection was one of the most impactful. When one team member expressed their reluctance about changing processes, another team member described how inaccurate searching wasted their time and made it harder to do their job. Yet another team member stated to the resistant one, "[name], [they] need you to do this in order to do [their] work!"[46] After this discussion, one of the test projects that used the new processes yielded significant change. While CATS had in the past received 100% of bibliographic materials with unclear selection criteria or that lacked other key information, the new processes meant that none of the materials had those issues.[47] This, in turn, made the CATS team members whose work was improved even more enthusiastic about the new processes. The individual who was resistant is willing to continue to follow the new processes as a courtesy to their colleagues.

Managing change and supporting individuals is also an ongoing process that takes considerable time and attention from leadership. At Montana State University, Mauch/Cresta provided both intensive support during the redesign and supported the project leader in sustaining support for managing change. Mozina observed that when people are used to doing something a particular way, the easy path will be to do it the same way. Deviating from the old way can arouse emotion and stress, and people will naturally resist the additional effort associated with the new practice.[48] Countering this natural tendency requires significant effort by individuals, peers, and organizations.[49] Team members needed to acknowledge the urge to fall back into old habits, remind themselves of the rational path, and use the new practice. Manager expectations and peer support play essential roles in supporting these changes. Balzer acknowledges this reality in his observations about an institution's readiness to undertake a Lean redesign: "Major institutional change is an ambitious undertaking, and university leaders should be fully cognizant of the sustained commitment needed to implement LHE [Lean in Higher Education]."[50] Indeed, some observe that many Lean redesigns fail in the long term because of lack of leadership support and because employees just don't want to change.[51] Additionally, staff turnover and changes in leadership introduce both challenges and opportunities. Onboarding new employees, or even new student assistants, gives the team a chance to introduce the improved workflows to colleagues unfettered by the "old way" of doing things. Furthermore, new team members are good at exposing points in the process that need more clarity or refinement.

The University of Washington Special Collections is a standalone department in a relatively large organization where, historically, most of the work has been done within the department rather than across the organization. Montana State University had the same situation despite its much smaller size and sought better integration across the three departments. For both organizations, the Lean process resulted in better integration both within the department and

across the organization. For instance, during the qualitative assessment at Montana State, one of the most frequently cited advantages was a better understanding of others' work. The process built better relationships across departments. For the University of Washington, attempting standardized work has necessitated partnerships with other departments. With the realization that SC can't do the work alone, they looked to other experts including Acquisitions, Cataloging, and Preservation.

Advocacy and Administration

Process redesign, continuous improvement, and managing change may be grassroots in nature, but they also require substantial support from leadership in order to be successful.[52] Responsible stewardship is not in itself the focus that upper administration may gravitate toward! But it enables the higher visibility things that administrators want, including exposing high profile collections, enabling impactful scholarship, and supporting transformative learning experiences for students.

For MSU, library administration enthusiastically supported the Lean process, including advocating for the grant that supported it and providing encouragement throughout the initial redesign. The results of the redesign increased library administration's understanding of responsible stewardship. Acquisition of prestigious collections that raise the library's profile and support transformative learning experiences for students was already a priority, but an understanding of what is required for responsible stewardship was less so. By articulating the steps involved, using well-formed tools from the TCS kit, and showing a determination to improve both quality and quantity, they were able to increase the understanding of those requirements. Over time, they anticipate they will learn more about how well they are able to match aspirations and resources to complete collection preparation within predicted timeframes.

Assessing Success

For both institutions, carrying out a Lean redesign advanced both efficiency and responsible stewardship. The most immediate results were improved communication and relationships both within the departments and across the organizations. For the University of Washington, the redesign measurably increased the amount of work done. For both organizations, the redesign increased standards compliance and the ability to re-use metadata.

For the University of Washington, with eight years passed since the Lean redesign, they can now see both success and failure. The director was thrilled with the initial outcomes and because the process had improved so dramatically, it seemed by all accounts that "accessioning was fixed." Everyone involved in the Lean launch and the subsequent activities–including daily huddles that continued for several years and weekly meetings that continue to this day—understands how crucial an improved accessioning process is to every other part of our work. In addition to permanent "fixes," they hired a temporary accessioning assistant for backlog management for 22 months. Using the new processes and concentrated staff time to attack the backlog, they moved 545 collections through the accessioning process, effectively cutting their "hidden collections" in half. It was due to the Lean process mapping that they were able to get a handle on the steps needed to daylight collections that hadn't yet gone through the accessioning process.

In spite of these successes, they still have a substantial backlog. Why haven't they obliterated it by now? It turns out that they aren't alone. TCS reasons that continuing backlogs

"cannot be addressed solely through increased efficiency in technical services and infusions of extra labor"; capacity constraint must be considered as well.[53] Capacity constraints, defined as "factors that limit production, performance, or output," are at the heart of the TCS framework and surrounding tools.[54] At the University of Washington, while accessioning was improved and continued to evolve, no amount of efficiency in that realm could get at the underlying issues surrounding the lack of sustainable stewardship of collections. Leadership (deans and directors) are encouraged to engage in process improvement by providing leadership support and developing an overarching collection management policy that embraces the TCS framework and thoughtfully considers staffing and space constraints.

A Lean redesign also requires significant time and energy to support it. In both cases, the departments needed the help of skilled consultants to design and carry out the redesign. For the University of Washington, that expertise was available in a unit on campus; for Montana State that expertise required an internal grant to support Mauch and Cresta's work. Both entities found that after conducting a successful redesign, it was challenging to sustain change and make continuous improvement part of the culture. Successfully sustaining change requires substantial support that begins at the highest level in the organization and continues throughout the hierarchy, down to individuals who are invested in the work and can also contribute to peer support. Balzer elaborates on all of these points.[55] Last, the constant change in any organization, including gaining or losing positions, key staff moving to other organizations, and special projects that take precedence over day-to-day work, makes continuous improvement difficult to sustain as a single unit. Instead, the enthusiasm for and commitment to sustaining change needs to be supported across the organization. Middle managers (e.g. department heads for archives and special collections) must be prepared to not only continuously support their and other department members, but to engage administration and solicit ongoing support.

Lean Principles for Archives Collection Preparation

Lean Principle[56]	Lean for Archives Collection Preparation
Customer defines value for each project	Prioritize what users value most over what archivists value most.
Identify (map) how value is created	Map the work in detail so that collections are prepared through a clearly identified sequence of actions
Focus on the flow of work and avoid any interruptions	Understand how work moves from one person to another and provide transparency in those processes.
Let the customer pull value from the producer	Provide predictability for preparation times.
Pursue perfection	Enable continuous improvement of processes that integrate the expertise of all personnel involved. Integrate new practices and innovations. Don't get stuck on just one way to do things!

Conclusion

For the special collections units in the libraries at the University of Washington and Montana State University, a Lean redesign for portions or all of collection preparation processes had

transformative impacts on quality and quantity of work. Both institutions learned valuable lessons about what is necessary to initiate and sustain change, to support team- and standards-based approaches, the key benefit of responsibility to each other, and the value of a framework that is not commonly used in special collections and archives. Both institutions increased their capacity for responsible stewardship. Most importantly, Lean's grassroots approach and respect for people allowed all staff, particularly those resistant to change, to engage with both the process and to carry through on changes to the work. With sustained administrative support and attention, archives and libraries can benefit from implementing Lean or other BPM approaches. Doing so is consistent with recent moves toward standardization, efficiency, and collecting within constraints. It is a substantial effort and an ongoing investment, but the ongoing results are worth it!

Acknowledgment

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Appendix A: Lean Background and Terms

The following are some common terms used in Lean. Montana State University and the University of Washington did not use these terms in precisely the same ways; these definitions reflect the common and variant uses.

Current state: The process "as is" today. Articulated and analyzed through a variety of means, including flowcharts, spaghetti diagrams, and others.

Future state: What processes will look like in the future, after redesign. Articulated through a flowchart or value stream diagram.[57]

Huddle or cross-functional group: A short, frequent, meeting of people who play roles in a workflow. Also known as a standup, these can be daily or another interval.

Lean launch: A cycle with a defined beginning and end devoted to designing or redesigning a process[58]

Process Redesign: Re-engineering a business process so that it delivers greater value to the customer(s).[59]

Lean Redesign: The active work of using Lean tools to reduce waste, increase value to the customer, and improve efficiency and quality.[60]

Respect for People: A focus on valuing the contribution and opinion of those involved with the work. A fundamental value of Lean.[61]

Report Out: Describing expected results and how the process must operate to deliver them.[62]

Kaizen: the Japanese philosophy of continuous improvement, applied in a short, intense, focused workshop that redesigns a sub-process.[63]

Appendix B: Montana State University Project Assessment Questions

1. Describe your role in processes (e.g. which new or revised processes did you "touch" the most?)
2. What do you think has changed about your work as the result of having new processes?
3. What hasn't changed about your work?
4. What do you think has changed about us as an organization as the result of having new processes?
5. What hasn't changed about us as an organization?
6. What do you think needs to change?
7. What are you most pleased about?

As part of planning for this assessment, the Project Director confirmed requirements for IRB review. She determined that, as an internal improvement/quality assessment initiative, IRB approval is not required (https://www.montana.edu/orc/irb/human_subjects_research.html). In reporting on this assessment, she is following best practices, e.g. not identifying individuals and seeking permission for any quotation.

Notes

1. See https://dictionary.archivists.org/entry/processing.html.
2. Other sub-disciplines include Total Quality Management, Operations Management, and Six Sigma.
3. Marlon Dumas, Marcello La Rosa, Jan Mendling, and Hajo A. Reijers, "Introduction to Business Process Management" in *Fundamentals of Business Process Management* (Springer Berlin, Heidelberg 2013): 1.
4. William K. Balzer, *Lean and Higher Education: Increasing the Value and Performance of University Processes*, 2nd Edition (New York: Routledge, 2020): 15.
5. James P. Womack and Daniel T. Jones, "Beyond Toyota: How to Root out Waste and Pursue Perfection," *Harvard Business Review*, vol. 74, no. 5 (1996): 140.
6. Kim Dong-Suk, "Eliciting Success Factors of Applying Six Sigma in an Academic Library: A Case Study," *Performance Measurement and Metrics* 11, no. 1 (2010): 25–38, https://doi.org/10.1108/14678041011026847.
7. Sarah Anne Murphy, "Leveraging Lean Six Sigma to Culture, Nurture, and Sustain Assessment and Change in the Academic Library Environment," *College & Research Libraries* 70, no. 3 (May 2009): 215.
8. Elizabeth Nelson, "Using Six Sigma and Lean in the Library," *College & Undergraduate Libraries*, 22: 3–4 (2015): 312–324, https://doi.org/10.1080/10691316.2015.1070701.
9. Shaunessy Everett and Marihelen Hatcher, "Do More, Better, for Less," *Library Journal* 131, no. 15 (September 15, 2006): 28.
10. Jeanne F. Voyles, Linda Dols, and Ellen Knight, "Interlibrary Loan Meets Six Sigma: The University of Arizona Library's Success Applying Process Improvement," *Journal of Interlibrary Loan, Document Delivery & Electronic Reserve* 19, no. 1 (January 2009): 75.
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12. Lenore A. England and Stephen D. Miller, *Maximizing Electronic Resources Management in Libraries: Applying Business Process Management* (Witney: Elsevier Science & Technology, 2015).
13. Elizabeth Nelson, "Using Six Sigma and Lean in the Library," 319.
14. J. Gordon Daines III, "Aligning Customer Needs: Business Process Management (BPM) and Successful Change Management in the L. Tom Perry Special Collections," *Library Leadership & Management* 29 no. 1, http://dx.doi.org/10.5860/llm.v29i1.7101; J. Gordon Daines III and Cory L. Nimer, "Integrating Process Management with Archival Management Systems: Lessons Learned," *The Code4Lib Journal* 6 (2009), http://journal.code4lib.org/articles/1016 .
15. Daines, personal communication with Jodi Allison-Bunnell, 2020 October 2.

16. Mary Jo Pugh, "The Illusion of Omniscience: Subject Access and the Reference Archivist," *The American Archivist* 45, no. 1 (1982): 33–44; Elsie T. Freeman, "In the Eye of the Beholder: Archives Administration from the User's Point of View," *American Archivist*, 47 (Spring 1984): 111–123.

17. Paul Conway, "Facts and Frameworks: An Approach to Studying the Users of Archives," *The American Archivist* 49, no. 4 (1986): 393–407.

18. ARL Research, Teaching, and Learning. Exposing Hidden Collections Conference Summary, 2003. http://www.arl.org/rtl/speccoll/hidden/EHC_conference_summary.shtml; ARL Special Collections Task Force Final Status Report July 2006, https://www.arl.org/wp-content/uploads/2006/07/special-collections-task-force-final-status-report-july2006.pdf; both accessed 2021 January 11.

19. "Program History," https://www.clir.org/hiddencollections/program-history/, accessed 2021 January 11.

20. "Digitizing Hidden Special Collections & Archives," https://www.clir.org/hiddencollections/, accessed 2021 January 11.

21. Mark A. Greene and Dennis Meissner, "More Product, Less Process: Revamping Traditional Archival Processing," *The American Archivist* 68, no. 2 (2005): 208–63.

22. "User-centered Archival Description," in *Describing Archives: A Content Standard*, https://saa-ts-dacs.github.io/dacs/04_statement_of_principles.html#user-centered-archival-description, accessed 2020 December 11.

23. Chela Scott Weber, Martha O'Hara Conway, Nicholas Martin, Gioia Stevens, and Brigette Kamsler, *Total Cost of Stewardship: Responsible Collection Building in Archives and Special Collections*, (Dublin, OH: OCLC Research, 2021), https://doi.org/10.25333/zbh0-a044, accessed 2021 September 23.

24. Collecting areas include a rich Pacific Northwest Collection and other special collections including architecture, 19th-century and 20th-century American and English Literature, Book Arts Collection, the Labor Archives of Washington, and the University Archives.

25. In archives, "accessioning" refers to the steps taken by staff to establish preliminary physical and bibliographic control over an analog or digital acquisition. Although a standardized process is only just emerging, accessioning usually involves a minimal-level DACS description, rehousing, and a shelf or digital location. See https://dictionary.archivists.org/entry/accession.html.

26. Traditionally at University of Washington, curatorial staff are primarily responsible for acquiring materials whereas technical services staff accession, arrange, describe, and make materials discoverable using library systems. Curators are more public-facing while technical services staff are involved in hidden labor.

27. See https://dictionary.archivists.org/entry/finding-aid.html.

28. Collecting areas include agriculture; architecture and engineering; Montana and western history; Native Americans; Montana State University; politics and government; Montana history; and regional writers.

29. Since 2015, these have included collections from renowned writer Ivan Doig, scientist Frank Craighead, writer and filmmaker John Heminway, and modern artists Bob and Gennie deWeese.

30. ProCite was first released in 1983 and was popular in many industries, including libraries. It has been unsupported since 2013. https://en.wikipedia.org/wiki/ProCite, accessed 2021 October 25.

31. Kenning Arlitsch et al., "Digitizing the Ivan Doig Archive at Montana State University: A Rise to the Challenge Illustrates Creative Tension," *Journal of Library Administration* 57, no. 1 (January 2, 2017): 99–113, https://doi.org/10.1080/01930826.2016.1251251.

32. William K. Balzer, *Lean Higher Education*; Montana Library Strategic Plan, https://www.lib.montana.edu/about/strategic-plan/index.html, accessed 2021 June 7.

33. Cara Ball, Nicolette Bromberg, and Emily Hughes Dominick, "Accessioning All-Stars: Turning our Dysfunctional Process around Using Lean, A Process Improvement," Northwest Archivists Annual Meeting, Seattle, Washington, May 2016.

34. Center for Faculty Excellence, Montana State University, https://www.montana.edu/facultyexcellence/grantsawards/feg/2020feg-Rd2.html, accessed 2021 October 25. The Lean Redesign for Archives and Special Collections at Montana State University was facilitated by the partnership between Mauch Group LLC and Cresta Solutions LLC. Irene Mauch, principal of the Mauch Group, has over thirty years of experience with Lean and Six Sigma in a variety of industries, including higher education. Megan Mozina, principal of Cresta Solutions, has fifteen years of developing leaders and supporting strategic changes in higher education. In combination, they bring strong experience in process improvement in higher education, complementary skills, and extensive experience in online workshop facilitation. https://mauchgroup.com; https://www.crestasolutions.com, both accessed 2021 June 14.

35. As part of this process, the team members also agreed to a set of ground rules for the process that described shared expectations for attendance, engagement, timelines, video conferencing, and mindset.

36. In order to support the work of many small groups, the project director created an additional page for the main flowchart to document metadata and information flow among all the processes the group was develop-

ing. For instance, the overall description of a collection that is created in the process of working with a donor or seller becomes the basis for both the preliminary scope and content note in the accession record, which in turn appears in final descriptions like the finding aid. This allowed groups to see where information could be collected once and re-used, with or without modifications, and where standards-compliant forms needed to emerge.

37. Montana State University Library, Executive Team minutes, 2021 April 19 (not publicly available).

38. Adopting daily stand-up meetings with this group, or even with the entire group involved in the redesign, might be more typical. These twice-weekly meetings were more organizationally viable.

39. The two digital projects were completed by a vendor but needed to be integrated into the library's systems and made available to researchers. Two additional projects anticipated had unexpected issues with previous processing that made them unsuitable as test projects.

40. Chela Scott Weber, et al., *Total Cost of Stewardship*.

41. Ibid., 3–4.

42. Paraphrase, 2021 April. Used by permission.

43. Jodi Allison-Bunnell, Megan Mozina, Irene Mauch, "Your Work is Special! Lean Makes it Repeatable," Lean in Higher Education Conference, Glasgow, Scotland, 2021 October 21.

44. Christine Weideman, "Accessioning as Processing," *American Archivist* 69 (2): 274–283.

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50. William K. Balzer, *Lean Higher Education,* 102.

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53. Chela Scott Weber, et al., *Total Cost of Stewardship*.

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