LIBRARY LEADERSHIP & MANAGEMENT

Aligning Customer Needs: Business Process Management (BPM) and Successful Change Management in the L. Tom Perry Special Collections

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Introduction

A lot happens before an archival or manuscript collection can be made available for research use by patrons. Archivists use the term archival processing to describe the tasks used to prepare a collection for research use. Archival processing is defined as "[t]he arrangement, description, and housing of archival materials for storage and use by patrons."[1] It consists of a series of tasks that include accessioning the items, arranging and describing them, and creating access tools to help interested researchers discover them. Archivists have invested significant energy in creating workflows to help them manage these tasks.

Literature Review

Archival processing is central to the archival endeavor. It is what allows the collections in our holdings to be discoverable and useable by our patrons. Archivists are keenly aware that the steps that they take or fail to take "will either facilitate or impede physical and intellectual control over the entirety of a repository's collection."[2] The tight relationship between archival processing and successful reference service has meant that archivists have focused a lot of energy on trying to make archival processing as efficient as possible so that researchers have adequate access to these materials.

A lot has been written over the last decade about archival processing and its relationship with good reference service. The spotlight was placed on the need to improve the efficiency of archival processing by a white paper released in 2002 by the Association of Research Libraries entitled "Hidden Collections, Scholarly Barriers: Creating Access to Unprocessed Special Collections Materials in North America's Research Libraries."[3] The report highlighted the fact that inefficient processing practices had created backlogs of undescribed and unavailable archival and manuscript collections whose lack of availability were inhibiting scholarship.

Numerous archivists have posited strategies for eliminating and preventing backlogs over the last several years.[4] Mark Green and Dennis Meissner's 2005 article "More Product, Less Process: Revamping Traditional Archival Processing" focused discussion on the best way to eliminate and prevent backlogs squarely on archival processing. They argued that the best way to eliminate backlogs is to "change the way we process so that we, with our existing resources, roughly triple the speed with which we process."[5] The Greene/Meissner article sparked an intense discussion about processing procedures in the archival community.[6]

It was in the midst of these ongoing discussions about eliminating backlogs and improving the efficiency of archival processing that staff members in the L. Tom Perry Special Collections[7] (hereafter Perry Special Collections) began looking for tools and techniques to better enable us to meet the needs of our patrons.

Managing Archival Processing in the L. Tom Perry Special Collections

This paper examines a project undertaken at Brigham Young University to automate and improve the archival workflows used to manage archival processing in the Perry Special Collections. It briefly traces the history of the department's management of archival processing and how early attempts to automate the tasks associated with archival processing failed to achieve our goal of increased efficiency. It then introduces business process management (BPM) techniques and principles and concludes by examining how BPM enabled the department to achieve its goal of improved archival efficiency and better patron service by focusing on the needs of one of its main customer bases—its curatorial staff. Enabling curatorial staff to more efficiently process archival collections meant that those research collections were available in a more timely manner to our other main customer base—our patrons.

The Perry Special Collections began to systematically manage the tasks associated with archival processing in the 1990s. A processing checklist was introduced in the mid-1990s to enable curators and their student employees to track the various tasks that they were responsible for.[8] This checklist mirrored the existing workflow and was readily accepted by curatorial staff. In 1999 a second version of the checklist was developed, simplifying the form itself while making slight adjustments to the workflow. Changes in departmental procedure prompted changes to the checklist again in 2003.[9] During the course of that year an electronic

accession database was developed, Encoded Archival Description (EAD)[10] was adopted, and the departmental stacks manager position was expanded into a broader collections management position. Cross-functional transfers in processing activities, such as the passing of materials between different departments, were incorporated into the workflow, increasing the need for tracking. It was also around this time that departmental staff began to wonder how efficient the workflow was that had put into place to manage archival processing. Gathering the necessary statistical information to understand how well the workflow was functioning proved to be extremely difficult and time-consuming as the information had to be extracted from the paper processing checklists.

The implementation of new tools and a revised workflow pushed several members of the curatorial staff out of their comfort zones. It became apparent to department leadership that the value of these changes needed to be explained and that improved efficiencies in departmental processing workflows needed to be demonstrated to help the curatorial staff buy into the changes. In order to improve departmental ability to gather statistical information about its processing workflow and facilitate the tracking of the tasks associated with that workflow, a committee was formed in 2004 to develop an electronic workflow management system. The committee was composed of curators who were enthusiastic about the changes that were being implemented as well as curators who were more skeptical of the changes. The committee was charged with investigating the feasibility of automating the department's tracking forms and developing a prototype system using Microsoft Access. The committee envisioned the creation of this Access database as the first step in the complete automation of our workflows. The committee later came to recognize that what it hoped to develop was a web-based archival management system. The system developed by the department was called eWorkflows. This new tool aimed at automating the processing checklist while integrating several standalone databases that had been developed to manage different parts of the processing workflow. These databases included an accession database and a location guide database. The plan was to split the departmental processing workflow with accessioning and tracking activities built into the eWorkflows system and descriptive activities occurring outside the system using XML editors. eWorkflows would track descriptive activities by recording dates of completion and the person completing the descriptive work. Student employees made significant progress in building eWorkflows and it seemed that the system would meet departmental needs until concerns surfaced about its long-term sustainability. Administrators also expressed concern that

eWorkflows was being developed by students rather than the Library Information Technology (LIT) division. These concerns resulted in the suspension of development in early 2005.[11]

The cancellation of the eWorkflows project did not eliminate the department's need to better manage its archival processing workflow or to gather information demonstrating the value of the new workflow. The department submitted a proposal to the library administration to have the LIT division develop a system accomplishing the intent of eWorkflows. Begun in early 2005 and titled the Integrated Digital Special Collections (INDI) project,[12] the intent was to streamline and improve the workflow processes in the Perry Special Collections. It also aimed to integrate national best practices into a workflow database system.[13] With the INDI system, the department sought to make it easier to manage the assignment and tracking of processing tasks, institutionalize departmental review steps, and integrate a variety of functional areas, such as processing activities, collection management, and micrographics. It also aimed to integrate multiple, at times redundant, database applications in use in the department.

The INDI system was built on a project management framework and included multiple phases of development:

- Phase one included the base application, a project management engine, and an accessioning tool;
- Phase two called for a tool for archival description; and
- Subsequent phases were to focus on other aspects of the Perry Special Collections' distributed workflow. Among the areas to be included in these phases were reference, collection management, and digitization.[14]

Phase one of the application was released internally in July 2007 and the code for this phase was publicly released in August 2008 under an Apache 2.0 license.[15]

The first phase of development was highly encouraging to project staff. It was exciting to see a system built that could meet specific identified needs. Unfortunately, concerns about the long-term sustainability of the project again emerged when the application programmer left the employment of the university in late 2007. By the end of April 2008, work on the existing code base was halted and the department had begun planning for a replacement system.

The first step in planning for a replacement for the INDI system was a review of requirements documentation and an examination of existing archival content management systems to determine if they could meet departmental needs. The INDI project team was asked to perform this review. Their review of the requirements revealed a need for two types of functionality: 1) task management and 2) archival content management. The project team also discovered that, in spite of earlier efforts to involve curators in the development of the eWorkflows system, members of the curatorial staff felt disenfranchised from the development of the INDI product. The team needed to do a better job of involving all of the curators in the department in the selection and adoption of a replacement system. Several of the curators were openly skeptical about the goals of the project and the team needed to help them understand the value of the project and the benefits that it would bring them as well as our patrons.

The department had initially approached the development of the INDI system using a project management paradigm. However, the project team quickly discovered in the testing of INDI that a system based on project management did not work as anticipated. Projects are unique, with steps or tasks defined in the context of each project. The department did not want to treat each new archival or manuscript collection as a project that wasn't replicable. What it wanted to accomplish was the standardization of archival activities by using the same procedures every time for all new archival and manuscript collections. This was not a project management approach. Rather it was task-based management, and the project team quickly discovered a field devoted to this type of activity—business process management. It also discovered that business process management offered tools for increasing the involvement and buy-in of curatorial staff.

Business Process Management

Business process management (BPM) focuses on aligning organizations with the needs and wants of their customer bases through the "systematic management, measurement and improvement of all company processes through cross-functional teamwork and employee empowerment."[16] It supports "business processes using methods, techniques, and software to design, enact, control, and analyze operational processes involving humans, organizations, applications, documents and other sources of information."[17] BPM is all about standardizing activities and processes in order to improve organizational efficiency in meeting customer needs—both internal and external customers.[18] This was exactly what the department was trying to accomplish. It needed to improve the efficiency of its processing workflows so that they

met the needs of curatorial staff and improved their ability to make archival and manuscript collections available to patrons in a timely manner. The department also needed to increase the buy-in of curatorial staff in the implementation of a new set of tools and an adjusted archival workflow.

The appeal of BPM was the fact that it "addresses the interdependence of strategy, people, processes, and technology in achieving business objectives."[19] It provided tools that would allow the department to carefully evaluate its business processes and develop better ways to implement them—all with the end goal of allowing our curatorial staff to provide improved services to our patrons.

It is useful to define exactly what is meant by the term *business process*. Definitions vary widely through the literature, but the one that resonated with the department defined a *business process* as "a series of interrelated activities, crossing functional boundaries, with specific inputs and outputs."[20] It is a set of steps or tasks (workflow) that need to be completed in order to offer a particular service. In this sense, archival processing comprises the various activities necessary to acquire, process, preserve, and provide reference service for a collection.

BPM provides a number of tools that enabled the department to design and implement more efficient business processes. A brief discussion of each of these tools will be followed by a more in-depth examination of how the project team has used these tools in the Perry Special Collections. The tools that will be examined are process mapping, process modeling, statements of work, and use cases.

Process Mapping

Process mapping is the process of analyzing business processes to help "increase customer satisfaction by identifying actions to reduce process cycle time, decrease defects, reduce costs, establish customer-driven process performance measures, reduce non-value-added steps, and increase productivity."[21] Process maps allow organizations to gain a better understanding of how a business process functions and who the major players in the process are. The two principal types of process maps are: 1) relationship maps that "show the customer-supplier relationships or linkages that exist between parts of an organization"[22] and 2) cross-functional process maps that "show how an organization's major work processes cut across several functions."[23]

Process maps can be built at three levels of specificity: macro, functional-activity, and task-procedure. Macro flowcharts typically depict two to seven steps that are the critical elements of a process. They facilitate understanding the big picture and help to define the boundaries of a business process. Functional-activity flowcharts are a mid-level of detail. They include the job titles of the people working in the process as well as the activities that they perform. Task-procedure flowcharts are the most detailed. They include all of the details necessary for a new hire to know how to perform their job.[24]

Process mapping is a useful first step in improving the efficiency of a business process. It "helps you plan your route, highlights obstacles and opportunities along the way, provides a way to gauge progress, and helps you communicate and illustrate your intentions to others."[25] With a clear understanding of the activities in the business process and how they interact with other activities, the next step is modeling that business process.

Process Modeling

Process modeling involves "modeling a business process, using standard graphical and XML representations, as a flow of activities."[26] It involves carefully analyzing the component pieces of a process and how they work. Finished process models describe the conditions that "define how and when an activity is performed."[27] Process modeling is done for both the actual process and the proposed process improvement. Processes are modeled using at least one of the following charts: general process charts, process flow diagrams, process activity charts, or flowcharts. General process charts summarize "the current process, the redesigned process, and the expected improvements from the proposed changes."[28] They provide a good overview of the entire process and how component tasks interact. They describe the activities by category, the amount of time each activity takes, and what percentage this represents of the time that it takes to complete the entire business process. Process flow diagrams allow staff to "draw movements of items from one activity or area to another on a picture of the facility."[29] They are useful for identifying redundancies and unnecessary movement between tasks. Process activity charts complement the general process chart by "providing details to gain an understanding of the sequence of activities in the process."[30] They are useful in identifying which tasks provide value to the process and which tasks function as controls. Flowcharts are the BPM tool that most people are familiar with. They are used to "graphically depict activities, typically in a sidelong arrangement such that they follow the movement of a job from left to right through the

process." [31] Flowcharts are useful in identifying decision points and parallel activities in a process.

When used in conjunction with process mapping, process modeling provides a powerful window into how an organization can streamline its work and achieve optimal efficiency. It allows organizations to envision changes to activities and their inter-relationships without actually changing anything and allows them to explore various possibilities for process improvement before actual implementation. It provides an excellent opportunity to gain feedback from staff when change to existing workflows is necessary or desirable. Once a business process has been mapped and modeled, organizations are ready to move into the implementation phase. Statements of Work (SOW) and use cases help define what needs to be accomplished and establish the parameters of the work to be done.

Statements of Work

While SOWs can be used in a variety of contexts, they are particularly powerful when paired with BPM tools. A SOW is "a specific statement regarding the requirements needed in a service contract. The statement of work should include all aspects of job requirements, performance and assessment." [32] SOWs are generally used to help automate processes. They describe the current process and then represent the proposed process in graphical and textual format. They can use elements from both process modeling and process mapping. They facilitate an understanding of the changes being made to an activity and how those changes will impact other activities in the process. They are essential to successfully completing any re-engineering project because a well-constructed SOW is "the keystone for clear communication and effective interaction between naturally distinct parties. It should provide a level of guidance that maximizes the chance that the final product will serve the purposes of the partner or sponsor." [33] It is a very powerful tool for sharing information about proposed changes in ways that staff members can understand and agree to. The SOW typically includes a description of the scope of the work to be accomplished, the location of the work, and the expected period of performance; a deliverables schedule; a list of the applicable standards to follow in the redesign process; criteria for successful completion of the project; any special requirements; and any additional information useful to completing the project. [34]

Use Cases

Another useful tool is the use case. Use cases "describe the outwardly visible requirements of a system. They are used in the requirements analysis phase of a project and contribute to test

plans and user guides. They are used to create and validate a proposed design and to ensure it meets all requirements."[35] Use cases are very helpful in establishing the boundaries of the system or processes that leaders hope to implement. They "allow description of sequences of events that, taken together, lead to a system doing something useful."[36]

Use cases also help identify the actors involved in various activities and what they want from those activities. For the purposes of use cases, actors are defined as "anything that interfaces with your system—for example, people, other software, hardware devices, data stores, or networks. Each actor defines a particular role."[37] Use cases typically include two components—a diagram featuring the actor(s) and how they interact with the system and a *flow of events* statement. The *flow of events* statement is "a series of declarative statements listing the steps of a use case from the actor's point of view."[38] Taken together the use case diagram and the *flow of events* statement provide a detailed description of how an automated process is supposed to work.

Business Process Management in the L. Tom Perry Special Collections

As previously mentioned, in 2008 the L. Tom Perry Special Collections terminated the INDI project. The main goal of the INDI project had been to build a database-driven Web application to automate and manage our archival processing workflows. Project staff members were asked to evaluate the possibility of using a two system solution to replace the INDI system. They were tasked with recommending an archival content management system that could be utilized in concert with a workflow management system. The archival content management system selected was the Archivists' Toolkit[39] and the workflow management system selected was ProcessMaker.[40] The process of evaluating our workflows so that we would be able to successfully implement both of these tools marked the beginning of the formalized use of BPM techniques and tools in the department. The rest of this article examines how the project team applied the BPM tools described above to examine and improve the workflow used to provide access to archival materials.

Processing Mapping

While process mapping can be done at the scale of an entire business process, the project team found it to be most useful at the level of a particular activity. They divided archival processing into its subcomponents and then mapped those components. The following figure (Figure 1) shows the relationships and functions of the Perry Special Collections redesign of the

appraisal activity. It indicates what the component tasks of appraisal are and who is responsible for completing each of those tasks. Similar mappings were created for the department's other processing activities. Process mapping enable the project team to help the curatorial staff understand the relationships between the different activities they engaged in and how adjusting those relationships could improve the efficiency of archival processing resulting in better patron service.

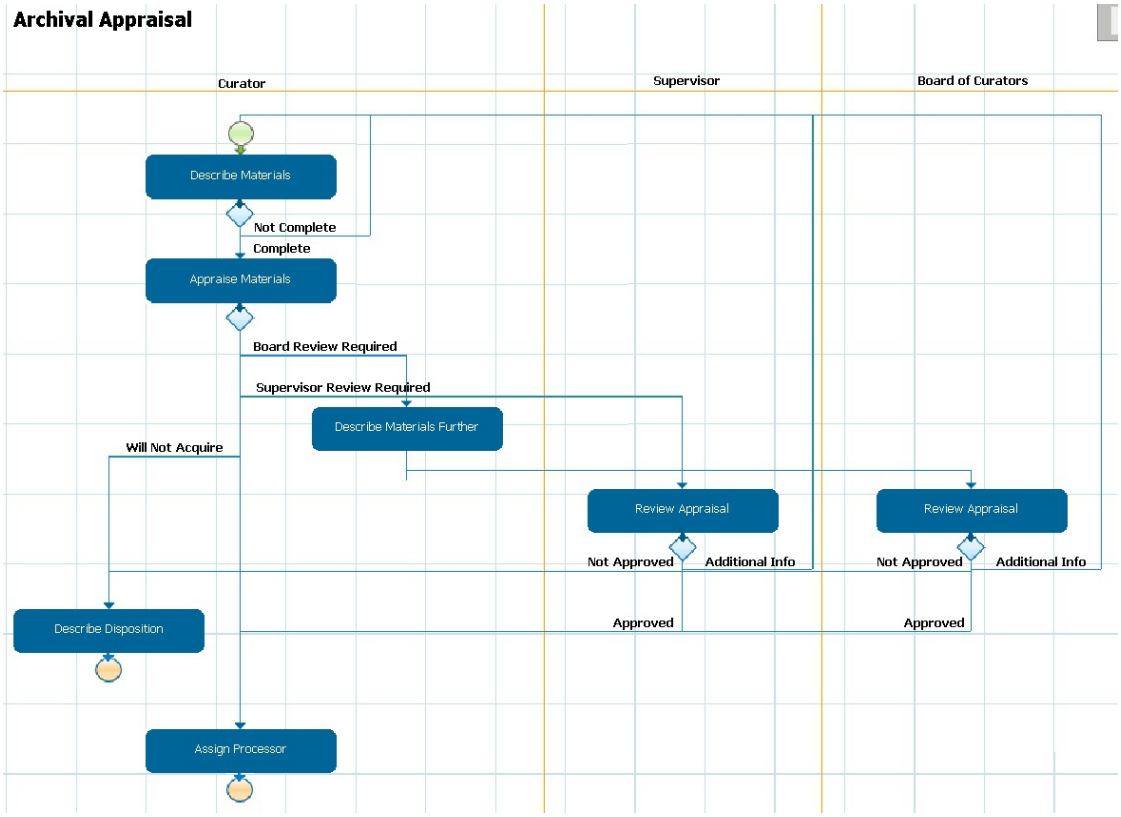

Figure 1. Appraisal process map

Process Modeling

The next BPM tool that the project team utilized was process modeling. The process modeling tool that the project team found most useful in gaining an understanding of the department's archival business process, and communicating that information to curatorial staff, was flowcharting. The project team used flowcharts to gain a better understanding of each of the component workflows that comprise the department's archival business process. The following figure is a sample flowchart (Figure 2) from the redesign of the departmental archival business process. It maps the then-current appraisal process and underscores how complex even a relatively simple task can be. It revealed the number of decision points and tasks involved when a curator appraised a collection for potential acquisition.

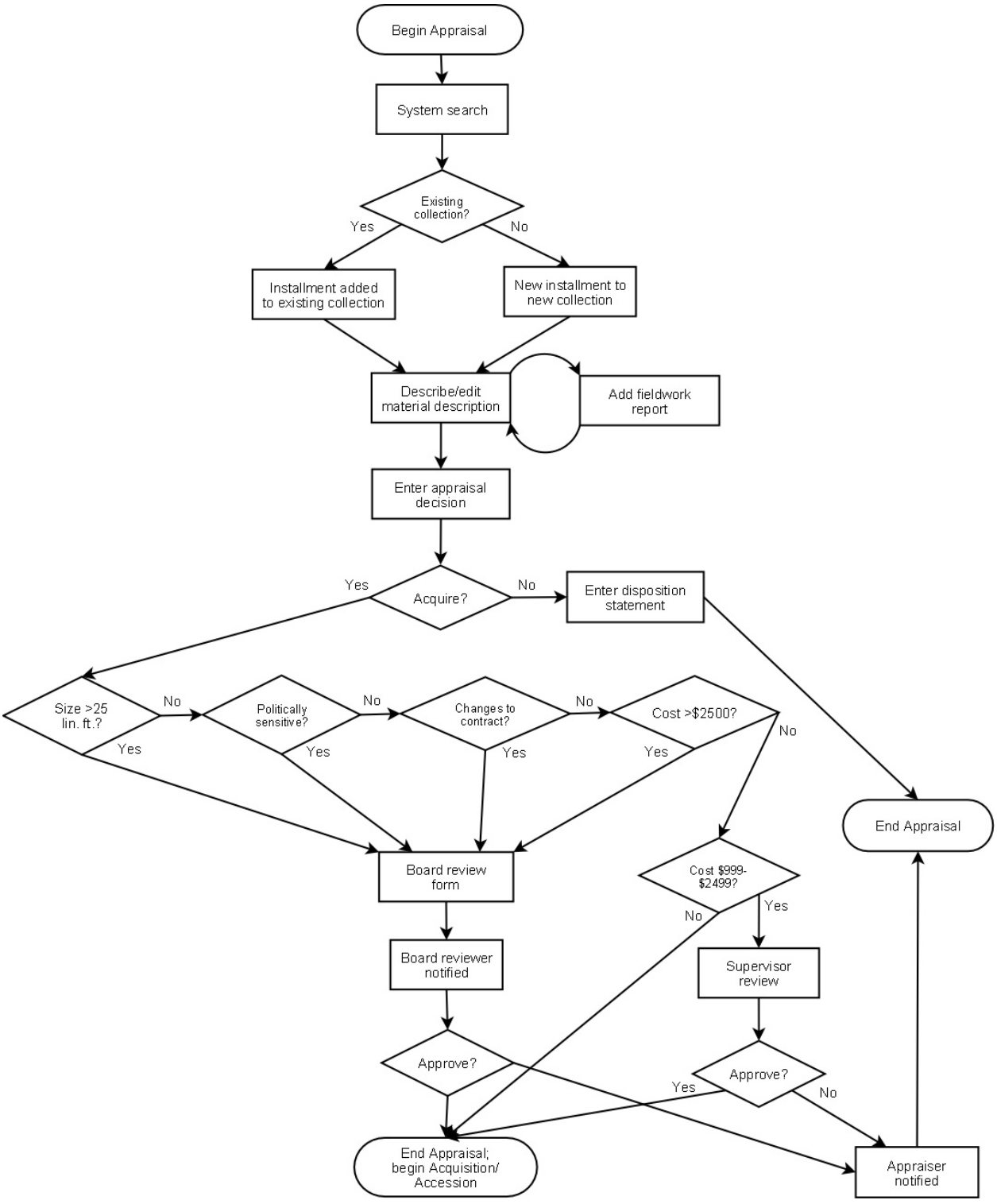

Figure 2. Appraisal Flowchart (Perry Special Collections) as of September 2008

The project team performed similar mappings for the other tasks in the department's archival workflow and sought feedback from the curators to ensure that their needs were being met. Armed with feedback from the curators, the project team created new flowcharts indicating how the workflow might be modified to be more efficient. The following flowchart (Figure 3) illustrates the proposed workflow for basic processing.

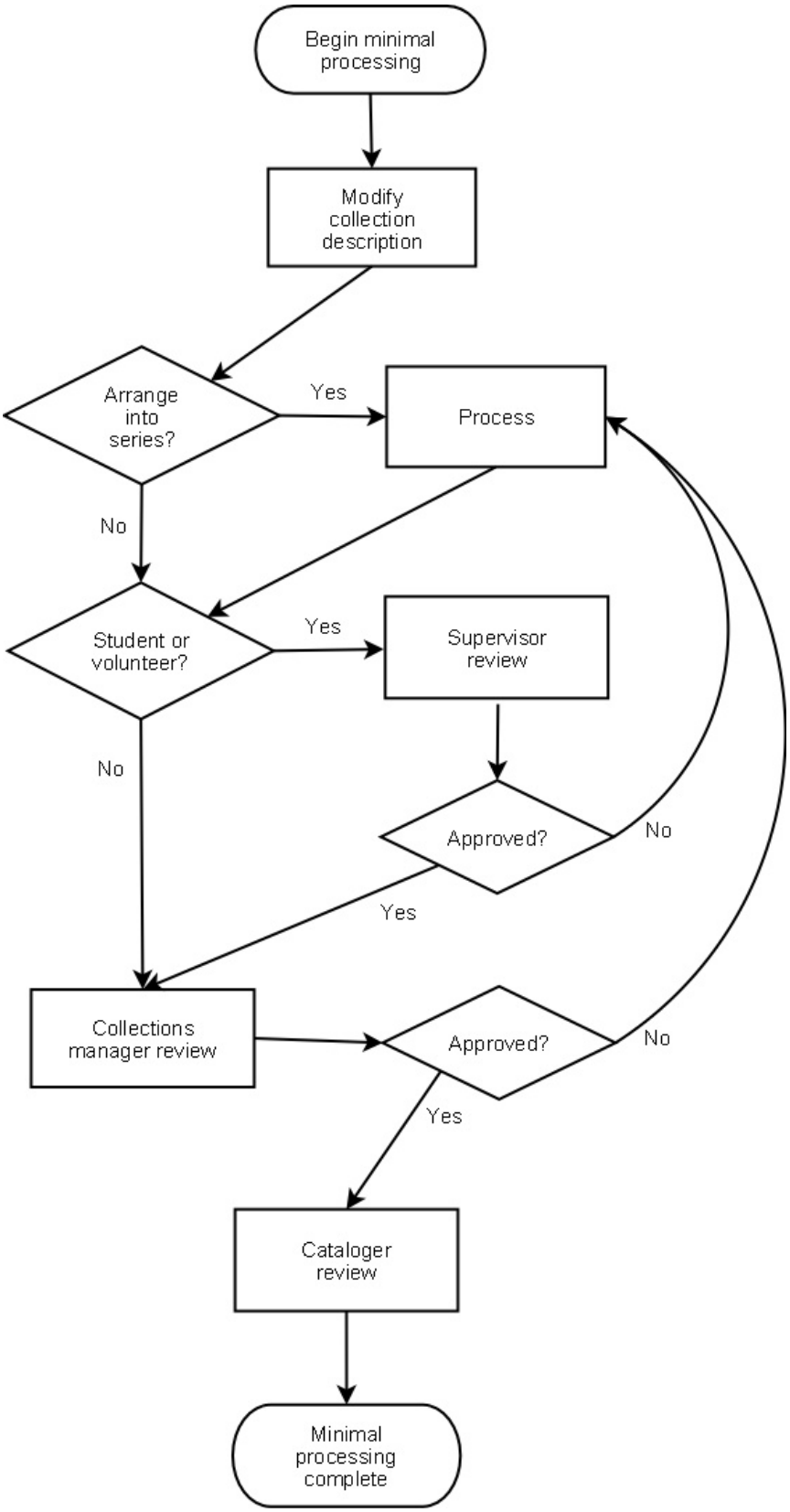

Figure 3 Proposed flowchart for minimal, or basic, processing tasks.

Flowcharting these processes allowed the project team to identify several redundancies in the departmental workflow that were then eliminated. The elimination of these redundancies had immediate impacts on the efficiency of the departmental workflow. Tasks that had been bouncing between staff members were adjusted so that all of the tasks performed by a specific staff member were completed before moving on to the next staff member. The use of flowcharts also allowed the project team to incorporate feedback from curatorial staff in the redesign of the departmental workflow. Once the project team had completed the modeling of the departmental archival business process, it turned its attention to automating as much of the business process as possible.

Use Cases

The department next engaged with use cases. Use cases are particularly helpful in identifying the "actors" involved in various activities and what they want from those activities. A use case for appraisal (see Figure 4) reveals that three actors are potentially involved in appraisal: the appraiser, the appraiser's supervisor, and the board reviewer. It also indicates the steps related to the appraisal task: description of an installment, making an appraisal decision, and reviewing an acquisition.

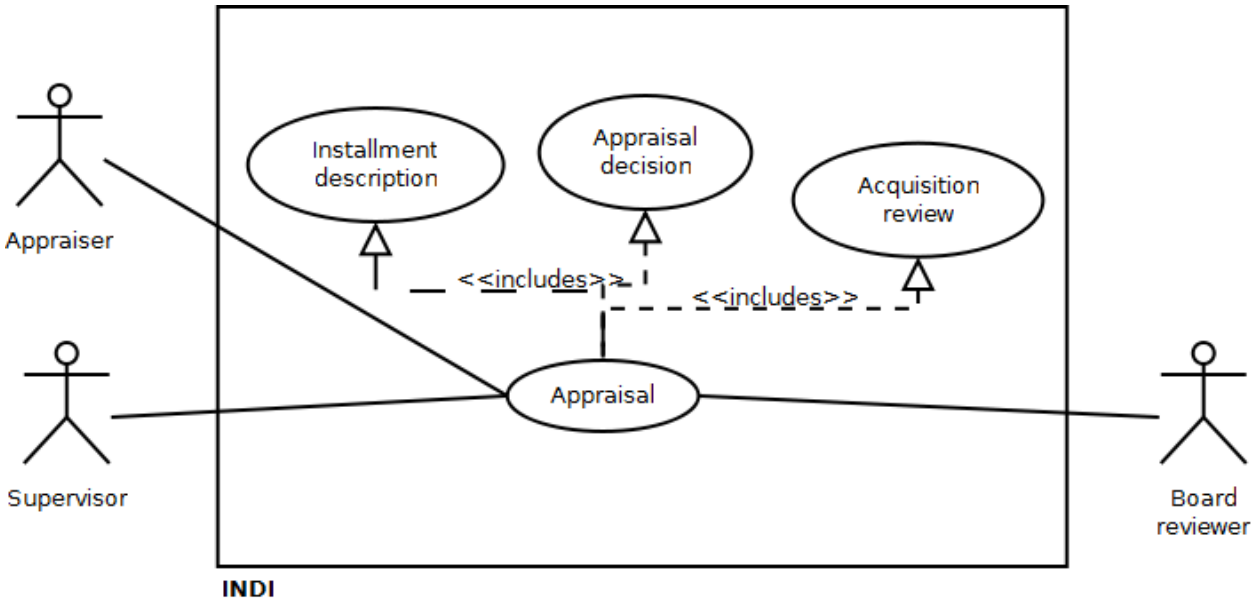

Figure 4. Appraisal Use Case diagram

The *flow of events* statement that accompanied this use case detailed the multitude of possible choices that an actor could make in initiating an appraisal workflow and how a system should

respond to each of these choices. Taken together, the use case diagram and *flow of events* statement provided the project team with a high level of detail that exposed points of potential improvement in our implementation of the appraisal activity.

Workflow Management Systems and Statements of Work

Having successfully modeled the departmental archival business process and created a number of new workflows including appraisal and basic processing, the project team began to consider how to automate these workflows. The team quickly realized that a workflow management system (WfM) could help it accomplish its task. Workflow management systems exist to "support the definition, execution, registration and control of business processes."[41] WfM systems guide users through the defined process, and provide controls to ensure that each task is performed according to the process model. Common system features include task routing, automated notifications, rules-based decision making, time-limit enforcement, prioritization, task tracking, and reporting. WfM systems require process participants to complete steps in their sequence, and allow administrators to measure the effectiveness and efficiency of the process. When used in concert with the archival content management system that the project team had selected a WfM system could help improve the efficiency of the entire process of preparing an archival collection for research use.

The project team analyzed a number of different WfM systems and decided that ProcessMaker best met departmental needs. ProcessMaker provides a SOW template that aided the project in automating the workflow comprising the department's implementation of the archival business process. The ProcessMaker template requires: an executive summary describing the project and the reasons that it has been undertaken, objectives and project scope, methodology that will be used, an analysis of the current situation, an evaluation of the need and potential for success of the project, and the proposed solution (which includes expected deliverables, an elaboration of the various steps for each activity, and workflow requirements). To complete the SOW the project team used cross-functional process maps, flowcharts and process flow diagrams to understand how work is distributed in the department and to model the team's proposed application of the archival business process. The project team created three SOWs—basic processing, value-added processing, and appraisal—that have been implement in ProcessMaker.

The use of SOWs was particularly useful in helping the project get buy-in from curatorial staff. The project team presented the SOWs at a departmental meeting and then distributed them via

email to curatorial staff.[42] Curatorial staff members were given the opportunity to give feedback and that feedback was used to modify the SOWs prior to their implementation in ProcessMaker. The SOWs helped the project team ensure that expectations were properly managed and that everyone was operating from the same framework. The SOWs allowed curatorial staff to see how changes to our workflow would have a direct impact on their efficiency and their ability to prepare the research collections in their stewardship for use by our patrons.

Conclusion

The use of BPM tools and techniques in the Perry Special Collections provided the department with a methodology to examine and improve the workflow used to provide access to archival materials. These tools enabled the project team to visualize its workflow in a variety of ways, which the team was then able to share with curatorial staff to ensure that the modifications to the workflow would enable them to successfully complete their jobs. They also allowed the department to successfully automate that workflow. Increasing the efficiency of archival processing had the added benefit of allowing us to make newly acquired archival and manuscript research collections available to the research public in a timelier manner.

We continue to evaluate the effectiveness of the changes brought about by our implementation of BPM tools. The automation of our processing workflow has enabled us to track where in the process of archival processing each collection is and this has gone a long way to eliminating additions to our small backlog of unprocessed collections. It has also enabled us to ensure that our curatorial staff is complying with departmental policy about processing archival collections within 30 days of their acquisition. This means that these newly acquired collections are available to our research patrons in a timely way. Focusing on the needs of our curatorial staff enabled us to improve our workflows in such a way that service to our patrons has greatly improved. This demonstrates the power of BPM tools and their potential for improving library services.

The BPM tools and techniques discussed in this article are applicable in a variety of library settings. Library leaders should constantly be thinking about ways to become more efficient in meeting the needs of their various patron bases. BPM provides a variety of very powerful tools to help them accomplish this goal. The real strength in BPM tools is that they allow leaders to look at the needs of all of their customer bases, including staff members, in a variety of ways and from a variety of perspectives. BPM tools help leaders understand how enabling staff

members to be more successful has a cascading effect on the service level that can be provided to patrons. This enables leaders to make informed decisions that can be successfully implemented to better improve library's abilities to deliver their services. BPM tools are not difficult to use and provide a wide range of benefits. Library leaders should use BPM tools to lead successful change initiatives.

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