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Project Management: A Technique for Coping with Change*

Filippa Marullo Anzalone**

In today's fast paced and challenging work environments, law librarians should consider using project management techniques to help them manage change. Professor Anzalone introduces the concepts of this effective and highly versatile management solution.

¶1 How do we manage the changes that we face in the information profession? Information managers encounter multiple challenges in resource formats, diverse clients and staff, and evolving technology platforms and interfaces on a daily basis. Unfortunately, increasing demand for technology implementation in library operations and for expanded user services has occurred at the same time that most library budgets and staff sizes have decreased.[1] We law librarians must find ways to manage both resources and people more effectively.

¶2 Project management offers such an instrument. It is a highly organized and information-driven management tool that, for now, is used primarily by the

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1. Library literature on the dilemma of managing change and reengineering with diminished budgets and staff is abundant. For information on the general academic library's plight of having to do more with less, see Barbara G. Leonard, *The Metamorphosis of the Information Resources Budget; Library Finance: New Needs, New Models,* 42 LIBR. TRENDS 490 (1994); PEGGY JOHNSON, AUTOMATION AND ORGANIZATIONAL CHANGE IN LIBRARIES (1991). For some observations on the future of law libraries and law librarianship in particular, see Kathleen M. Price, *Technology and Law Library Administration,* 70 ST. JOHN'S L. REV. 145 (1996) (excellent discussion of change in library administration in the face of the rapidly advancing technology); TOWARD A RENAISSANCE IN LAW LIBRARIANSHIP: THE REPORT, RECOMMENDATIONS AND MATERIALS OF THE AMERICAN ASSOCIATION OF LAW LIBRARIES SPECIAL COMMITTEE ON THE RENAISSANCE OF LAW LIBRARIANSHIP IN THE INFORMATION AGE (Richard A. Danner ed., 1996) (in addition to the final report and recommendations, it also includes pertinent and thought-provoking short papers by the "blue ribbon group of law librarians" who were members of the special committee for the two years it existed). For a short but very telling editorial on public libraries coping with change, see Nancy Melin Nelson, *Imagine! More Cats in the Hat: Books, Services, Staff; Library Budget and Staff Cuts,* COMPUTERS IN LIBR., Apr. 14, 1994, at 4. *See also* Richard T. Sweeney, *Creating Library Services with Wow! Staying Slightly Ahead of the Curve; Buildings, Books, and Bytes: Perspectives on the Benton Foundation Report on Libraries in the Digital Age,* 46 LIBR. TRENDS 129 (1997) (discusses creating libraries with a passion for added-value service and user satisfaction).

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manufacturing and building professions. Because a construction project is usually accomplished through the work of a number of subcontractors, such as masons, plumbers, electricians, and carpenters, project management, with its concept of a central team and manager, is widely used. In fact, project management has become virtually synonymous with the building and construction industry. Although service professionals may consider it a rather alien concept, project management is a flexible, mission-oriented management tool that can be used to move both complex and simple projects along.

¶3 Although project management's widespread popularity is a relatively modern management phenomenon,[2] it has been studied for almost a century.[3] Service professionals, including library and information center managers, would do well to adapt project management's structure to their work environments to move projects along with existing, and often reduced, resources and work forces.

¶4 In this article, I provide a project management primer for law librarians unfamiliar with this powerful organizational tool. I explain the four essential elements of a project management life cycle: conception, planning, implementation, and termination. I describe some of the visual aids, time management charts, schedules, and software available for project planning, monitoring, and control. Finally, I discuss some of the communication and interpersonal factors vital to managing a project team.

Toward a Definition of Project Management

¶5 In order to conceptualize what project management is, we begin by establishing definitions for the individual terms, "management" and "project." Management is defined as "the application of skill or care in the manipulation, use, treatment, or control of things or persons, or in the conduct of an enterprise, operation, etc."[4] Management has also been described as "the judicious use of a means to accomplish an end" and "the ability to enlist the active support of others to accomplish a goal."[5] A project is defined as "something projected or proposed for execution; a plan, scheme, purpose; a proposal.[6] A project is "any undertaking with a defined starting point and defined objectives by which completion is identified."[7] A project

2. The Project Management Institute, which collects and disseminates project management training materials and develops standards (e.g., *Project Management Body of Knowledge*), was established in 1969. For more information about the institute, see *Project Management Institute* (visited Nov. 3, 1999) <http://www.pmi.org>.
3. *See* Dan Marmion, *How Do You Manage Those Projects*, COMPUTERS IN LIBR., Feb. 1990, at 29. According to Marmion, project management has been seriously studied for over a century. In fact, project management pioneer Henry L. Gantt was born during the Civil War!
4. 9 OXFORD ENGLISH DICTIONARY 293 (2d ed. 1989).
5. AT&T MANAGEMENT EDUC. & TRAINING, INTRODUCTION TO PROJECT MANAGEMENT 2-2 (1989) [hereinafter INTRODUCTION TO PROJECT MANAGEMENT].
6. 12 OXFORD ENGLISH DICTIONARY, *supra* note 4, at 597.

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can be a "one-shot, time limited, goal-directed, major undertaking, requiring the commitment of varied skills and resources."[8]

¶6 Putting these definitions together, we can define project management as the *process* used to develop a plan or blueprint to achieve the delivery of a new product or service. It is a process that usually requires the integration of complex steps to achieve the actualization of a project with minimal disruption of other organizational goals. Because coordinating multiple tasks often involves a greater depth and breadth of knowledge and expertise than that commonly possessed by one person, a project team works under the direction of a project manager. The project manager has the responsibility of organizing and directing the physical and human resources needed to plan and ultimately execute the project.[9]

¶7 Project management differs from everyday functional management in some distinct ways. At the end of a project management cycle, a project manager and team will have created something new, and the team and the project manager will either move on to another enterprise or, most likely, return to their everyday functions. Most important, at the end of the process, there is always closure, a real end to the project management process.[10] In short, project management is a method for getting something done, whereas functional management is a method for keeping things going.[11]

Is Project Management Another Name for Strategic Planning?

¶8 Project management is often confused with strategic planning, the continuing and sometimes excruciating process of organizational self-examination that includes a statement of mission and goal setting.[12] Many law librarians are familiar with long-range strategic planning. By examining the differences between the two management techniques, we may arrive at a deeper level of understanding about what makes project management unique and especially appropriate for use in today's work milieu.

¶9 In good strategic planning, an organization collectively develops goals, objectives, and strategies to reach new and improved levels of service. The strategic planning process involves the whole organization, and decision making is

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7. Alice Gannon, *Project Management: An Approach to Accomplishing Things,* RECORDS MGMT. Q., July 1994, at 3, 3 (quoting PROJECT MANAGEMENT BODY OF KNOWLEDGE 16 (1986)).
8. *Id.* (quoting LINN C. STUCKENBRUCK, PROJECT MANAGEMENT: THE PROFESSIONAL'S HANDBOOK (1981)).
9. *See* INTRODUCTION TO PROJECT MANAGEMENT, *supra* note 5, at 2-2.
10. *See* Robert L. Sanders, *Finishing What We Start: A Lesson for Functional Managers From Project Management and Automated Workflow,* RECORDS MGMT. Q., Apr. 1995, at 48, 48.
11. *See id.*
12. For an excellent "primer" on strategic planning for libraries, see RICHARD A. DANNER, STRATEGIC PLANNING: A LAW LIBRARY MANAGEMENT TOOL FOR THE 90'S (1991).

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usually accomplished by democratically designed committees that operate through compromise. This is often an open-ended and time-intensive process.

¶**10** Unlike the loose brainstorming and shared decision making that is characteristic of long-range strategic planning, project management is an enterprise that is limited in time. A hallmark of project management is the concentrated and directed "intellectual effort involved in developing methodologies and control mechanisms to ensure that the good idea evolves into a service or product."[13] Consensus, often time-consuming to reach but highly valued in strategic planning, is actually an anathema to the shared vision, narrow, goal-oriented nature of project management. In project management, the individual members of a project team are selected on the basis of their special technical abilities and knowledge. In strong contrast to the democratically formed strategic planning committee, each project team member brings unique expertise to the group to enrich the team effort. So, although project teams are not hierarchically grouped, team decision making is not accomplished by group think, either. Rather, the project manager is charged with moving the project team inexorably toward its goal.

What Does a Project Manager Do?

¶**11** Within the collaborative work environment that exists when the project management approach is followed, the project manager occupies a sensitive position because he or she is not the normal supervisor to whom the team members report within the organization. The project manager is not a functional manager. For example, the project team members' evaluations, promotions, raises, and job security are usually not dependent on their relationship to the project manager, but rather to their line supervisor. As a result, the project manager's job is complicated by a real authority versus responsibility gap.[14]

¶**12** The project manager has to have a high energy level and be a manager of many talents to face multifaceted responsibilities. It is the project manager who must define the project goals, sell the project idea to top management, and negotiate resources for the project. It is the project manager who selects, motivates, monitors, and communicates with team members. And it is the project manager who, at project's end, evaluates and communicates the team's progress in meeting goals to all interested parties.[15]

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13. KIRSTEN BLACK, PROJECT MANAGEMENT FOR LIBRARY AND INFORMATION SERVICE PROFESSIONALS 3 (1996).
14. *See* PAUL C. DINSMORE, HUMAN FACTORS IN PROJECT MANAGEMENT 43 (rev. ed. 1990).
15. The roles of project managers are described in all the sources cited for this article. One particularly pertinent source for libraries is Elaine Sanchez, *Project Management and Organizational Change from the Advent to the Aftermath of Automation: Library and Cataloging Department Perspectives*, *in* INTRODUCING AND MANAGING ACADEMIC LIBRARY AUTOMATION PROJECTS 97, 97–98 (John W. Head & Gerard B. McCabe eds., 1996).

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Why Project Management and Why Now?

¶13 In today's work world, organizations are asked to deal continuously with change. To stay competitive and to respond to our users' rapidly changing needs, we need a model of elastic and accountable management. Library and information services management is evolving and changing rapidly. Job descriptions and responsibilities are outdated almost as soon as they are written. Flexibility within an organization and the ability to apply the expertise and talent of our staffs directly to demands and issues as they arise is key. Project management is an ideal tool for service organizations to use to respond to change quickly because it creates a parallel "organization within the organization" for the express purpose of developing a specific project. Since project management is used to control and manage the development of a single endeavor, it is characterized by flexibility and temporality.

¶14 Project management is especially suited to libraries because most libraries are made up of smaller departments which use distinct procedures to perform different operations. The departments function like the subcontractors in a major construction project. Because of the multiplicity of tasks and procedures in libraries, real change, even when relatively simple, is a complex matter to deal with. Major operational changes are usually consequential enough to be defined and managed as projects.[16] "[A]ny event or purchase that is out of the ordinary or a new experience can be defined as a project and benefit from being planned and implemented in a managed way."[17] Project management's objective—the more effective and efficient use of internal physical and human resources—presents a viable management solution for today's information professional.

> Given that end users are increasingly sophisticated, combined with tight budgets and schedules, we can't afford an overly hierarchical structure. We organize into projects and teams. We may be involved in any number of these, in varying capacities, at the same time. And everyone is expected to contribute. We have to move quickly, be effective and work independently.[18]

A Project Management Exemplar

¶15 Usually, an ongoing project coexists with the normal business of a particular organization. Consider, for example, the experience of a group of academic librarians at the Biblioteca di Ateneo of the Universita Degli Studi di Trento in Trent, Italy, which conceived and designed an orientation program for new library employees using project management techniques. The librarians on the project

16. *See* Sanders, *supra* note 10, at 52.
17. BLACK, *supra* note 13, at 1.
18. Leslie Goff, *Project Makes Perfect—Project Management Skills Are Becoming Must-have Commodities for IS Professionals*, COMPUTERWORLD, May 22, 1996, at 92, 92 (quoting Brian Graham, project manager for Columbia University's administrative information services).

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team decided that in order for new library workers to appreciate and truly understand the services provided by the library to the university community, new employees would spend time learning the procedures of each functional department of the Biblioteca di Ateneo via a rotational training program. The design and implementation of this orientation program occurred alongside the normal business of the library. In the beginning stage of the project's development, a project manager was selected who formed a team of technical specialists with the requisite expertise and experience to design the new project. Instead of retooling the organization as needs evolved, this horizontal, "mini-organization" actively worked toward satisfying a particular need, which was, in this case, the development of an effective employee orientation program.

¶**16** The librarians at the Biblioteca di Ateneo of the Universita Degli Studi di Trento designed an orientation program for new library employees in early 1997 as part of a seminar on library project management that I presented. We reviewed it and implemented it six months later in the summer of that same year during a follow-up session to the seminar. The pilot for the orientation program was so meticulously planned and so successfully implemented that it continues today! What made this orientation project different from the completion of other assignments was the librarians' serious commitment to using project management techniques. A project manager was chosen by the group and given apparent authority to act by the library director. The project team members were selected from the various departments and branch libraries of the Biblioteca di Ateneo to ensure that the orientation program would be inclusive and meaningful. The planning process started during the project management seminar and continued for about six months. During the planning process, differences of opinion were aired by various members of the team and moderated by the project manager. The project manager knew that she was operating under time and resource limitations and that she would be held responsible for the team's meeting the summer deadline for the project's implementation. Since team members had regular functional jobs to occupy their attention, the project manager made sure that communication about assignments and meetings was circulated and that progress toward the goals was carefully documented. I will use this orientation program for new library employees as an example to illustrate some of the points that I make about project management.

Step One—The Conception Phase

¶**17** Basically, project management takes a project through a four-step life cycle: conception, planning, implementation, and termination. The conception phase is the vision stage. No amount of resources, including money or people, will make a project a success without a thoughtful initial vision. Vital questions that can affect a project's path are appropriately asked at this stage of the process. Depending upon whether a project manager has been selected, these questions

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may have to be considered by the person or group who conceived of the project in the first place. A project can be initiated by an organization's senior administrator, a management committee, or intrepid staff who perceive a problem that needs fixing. Although a project is often imagined by a person or group who elect to put it in someone else's hands, the project's initiator and the project manager can be one and the same person as well. Some examples of vital conception stage questions are: was the project identified as a solution to an issue posed by an external source, such as a client or user group? Or was the project's impetus a perceived internal need, such as increasing staff productivity? Knowing whether the idea for the project arose out of a perceived external or internal need of the organization may affect how and with whom a project begins, its prioritization in the organization, and ultimately, how and when a particular project gets funded.

¶**18** Visualization of the project's end goal and working backward in the planning process to accomplish that end is probably the most indispensable step in the project management process.[19] To illustrate, at the Biblioteca di Ateneo, the idea for the employee orientation program arose out of an impression that new employees did not have a strong concept of the library's mission and services. By working backward from the goal—designing a program to help new employees learn about the work of other library departments so they would appreciate their contributions in the context of the whole operation—questions and issues about how to design the orientation program arose with ease.

¶**19** Visualizing and defining the project goal results in tightening the parameters of that goal before commencing the planning process.[20] Conception is the most creative phase of project management. Visualizing the effects that the project's completion will have on the library staff and clients includes asking whether their lives will be improved? What will the project mean to the people who will work on the project team? Why should this project be processed at all? Why will the team want to work on it? What will the library staff, the project team, and the library users do when the project is completed? What are some of the important steps in the process? Again, depending on where the idea for the project originated, these key questions may or may not be asked by the project manager and members of the project team. The questions may be asked by the organization's senior management, for example. Some of the answers to the conceptual stage questions are a prelude to the selection of a project manager. Some questions and reasoned responses will often help inform the selection of the team members if they have not already been chosen. The earlier the project manager is on board, however, the better.

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19. *See* W. Alan Randolph & Barry Z. Posner, *What Every Manager Needs to Know About Project Management*, SLOAN MGMT. REV., Summer 1998, at 65, 67.
20. *See* FERGUS O'CONNELL, HOW TO RUN SUCCESSFUL PROJECTS 5–7 (1994).

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¶20 Fashioning an outline of the project's life cycle is a logical next step in this initial stage of the project management process. Involvement of clients and staff is an essential step toward guaranteeing a project's success. Because it is important that perceptions about client or staff needs are accurate, communication between groups within and outside of the organization is key at this as at all other stages of the process.

¶21 Determination of the scope of the project is another important piece of work. What event or succession of events will signify that the project is finished? Again, visualizing the finish line and working backward is usually the best and most effective way to plan. Conceptualizing the end result is an essential first step toward ultimately accomplishing that result.

Resources at the Conception Stage

¶22 Although budgeting and allocation of resources is more properly part of the planning stage of project management,[21] sketching an estimate of the resources needed to accomplish goals is useful at the initial stage of the operation. Resources will naturally include personnel. What kinds of skill sets will be needed to reach the goal? Who has them?

¶23 Thinking about the composition of the project team at this stage is also vital. Who will lead the team? Will the project manager and the project's conceptualizer be the same individual? Perhaps the idea for a particular project originated with upper management and choosing an individual with a technical background as project manager may be more appropriate. Identifying a project manager and project team early on and involving them in the project management process will ensure that the manager and the team are motivated and enthusiastic about the process.

Communication during the Conception Phase

¶24 Communicating with the organization's upper management is also fundamental at this juncture. In addition to buy-in and cooperation from the library staff, clientele, and project team, it is just as significant for a project's success that the organization's upper management clearly understands the ramifications of the project's initiation. For the project to commence, especially if it needs significant financial and human resources, authority to advance with the process is of utmost consequence. Multidirectional lines of communication are key to this stage of the project management process. Creating external, internal, horizontal, and vertical communication channels at the conception stage of project management establishes trust among all concerned parties.

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21. *See infra* ¶¶39–41.

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Step Two—The Planning Phase

¶25 Spending time on the planning stage of a project's management will reap benefits in the execution phase.[22] The planning phase is the time to combine visualizations and daydreams into a concrete plan of action. This is the stage in the project's life cycle when detail plays a significant role. To illustrate, planning for the Biblioteca di Ateneo's new library employee orientation program took about six months. Planning the details of each rotation within the various departments and branches of the library for new employees was time-consuming and required collaboration of all project team members.

¶26 Personnel to be involved in the project should already have been identified in the initial conceptual phase. The consequential step during the planning phase is the organization of the team and enlistment of support for the process from both top management and the team members themselves. It is the responsibility of the conceptualizer and the project manager to define and pin down the objectives that will move the process forward toward the ultimate goal. It is crucial that the project manager and the team plan effectively and communicate their business rationale widely within the whole organization to avoid negativity and resistance to the process.[23] Setting the project's goals, defining the distinct tasks to be accomplished, and assigning team members to specific tasks all happen at the planning stage.

¶27 In the project planning stage, a means of monitoring and controlling the progress of the project's development must be established. Serious thought about how to track the project's evolution and keep the work flow on schedule is fundamental to this phase. You have to plan to manage and then manage your plan![24] Countless methodologies are suggested in the literature for the essential tasks of monitoring and controlling the project's progress.[25] Time-management aids and work-plotting tools, such as job-planning forms, job assignment forms, and work breakdown structure (WBS) forms, are available in a number of monographs[26] or textbooks on project management as well as in software[27] designed specifically for project management.

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22. A colleague who has been heavily involved in project management in libraries has opined that for every hour spent in planning, four hours are saved in the execution stage. Interview with Diane Klaiber, Executive Director of the New England Law Library Consortium, Harvard Law School, Cambridge, Mass. (June 13, 1996).
23. *See generally* James A. Ward, *Project Pitfalls*, INFO. SYSTEMS MGMT., Winter 1995, at 74 (discussing the fact that despite the best efforts of the project manager and the team, organizational forces can thwart a project's success).
24. Variations on this theme can be found in almost any book or article on project management. *See, e.g.*, Randolph & Posner, *supra* note 19, at 65.
25. *See, e.g.*, Tom D. Conkright, *So You're Going to Manage a Project*, TRAINING, Jan. 1998, at 60.
26. *See, e.g.*, O'CONNELL, *supra* note 20.
27. Microsoft Project™ is one example; its online wizard and tutorials provide excellent illustrations of many of the forms referred to in this article.

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Using Milestones for Project Control

¶**28** Some project management experts advise establishing short- and long-term checkpoints, or milestones, for project control. Project management is like a journey. Establishing frequent milestones for short-term control enables the project management team to detect and correct mistakes early on in the process.[28] A milestone used to determine how the project was moving along for the Biblioteca di Ateneo employee orientation program was whether each library department or branch library had designed activities for three to five days in their respective areas for new employees.

¶**29** Recognizing unplanned variations and taking remedial action promptly is a project management best practice. Although it is certainly difficult to foresee and plan all possible project milestones during the planning phase of a project's life cycle, it is best to start with the project's major issues and progressively move down toward the details.[29] Open communication with the members of the project management team should provide intelligence about the various possible scenarios. Frequent communication with both external and internal constituencies and environmental research about the enterprise to be undertaken in the planning stage of a project's life cycle will go a long way toward ensuring successful project completion. Because the outlay of resources is little to nothing in the conception and planning stages of project management, doing the "homework" is key toward guaranteeing success in the later stages of the project's life cycle. In the implementation phase, fiscal and human resources will be spent as the project management team invests considerable time and energy in the venture. Good information gathering before greater expenditures of resources will help the project management team remain motivated as the process evolves. Team members will more easily measure their progress if they are regularly encountering distinguishable short-term indications that their work is moving in the right direction toward attainment of a project's goal.

¶**30** Recognizing milestones, although vitally important, is just one activity of project monitoring and control. Scheduling and prioritizing activities are equally significant to a project's life cycle and its eventual success or failure. Deciding when particular actions in a project's life cycle must take place and determining the interrelationships between jobs—which jobs will intersect with others and

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28. *See* Randolph & Posner, *supra* note 19, at 67. Randolph and Posner use a bicycle travel metaphor to explain the use of checkpoints. Randolph and Posner have the reader imagine a European bicycle tour from Paris to Rome. Some milestones the bicycle tourists might use to check whether they are on the right path are Geneva, Switzerland, and Genoa, Italy. Reaching these cities would confirm that the cyclists were en route to their final destination of Rome. However, were the group to reach Zurich, Switzerland, instead of Genoa, it would be clear that a mistake had been made and the route would have to be reconsidered and perhaps remapped. Who among us has not been on a trip, lost our way, and had to use familiar guideposts or markers to get back on track and reach our ultimate destination?

29. *See* DINSMORE, *supra* note 14, at 92.

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which jobs are prerequisites for others—are both important parts of the design for ensuring that there will be adequate monitoring of the project's work flow and quality assessment.

Communication during the Planning Phase

¶31 There is a synergy involved in monitoring and controlling a project and communicating that progress beyond the team. Besides anticipating particular milestones to be identified throughout the project management process, it is just as crucial that the project manager plan ways to routinely check the team's work and to establish and use open communication channels.[30] In project management, if the team's work on the project is not monitored scrupulously, the whole effort can suffer expensive and totally needless delays or be derailed completely.

¶32 The fundamental process of planning for project tasks and establishing milestones is best accomplished by the project manager together with the project team. Better results are more likely when all key personnel are involved in the identification of the crucial tasks and agree on what significant milestones will ultimately serve as checks of a project's success. A project manager cannot manage the process alone. Working and communicating constantly with the team is a sine qua non of successful project management.

¶33 To illustrate, in Trent the project team had decided together on significant milestones early on in the project's planning stage. For example, whether the acquisition department designed an orientation module for their area by a certain date was significant in charting the project's process. Moreover, if the plan of the cataloging department's orientation module depended in any way on the employee's having first spent time in acquisitions, its layout would be stalled if the prerequisite milestone, in this case the blueprint of the acquisition training module, had not yet been accomplished. Developing milestones that involved interdepartmental communication could not have been done without a cooperative team effort in the planning stage.

Powerful Project Management Tools

¶34 Project management tools, such as charts and work forms, can be used throughout a project's life cycle. Normally the use of charts and other visuals is initiated in the planning phase and used to guide the project manager and team through the implementation phase as progress is charted and memorialized. In this way, the project's planned and actual progress can be compared and evaluated during the termination phase.

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30. *See* Randolph & Posner, *supra* note 19, at 67. Continuing with the bicycle trip metaphor, Randolph and Posner posit that if the bicycle's chain is not maintained and oiled, it could break and the whole trip could be stalled or even completely halted.

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¶35 Among the most popular and widely used management tools are the graphical charts that visually chart a project's progress. The GANTT chart, developed by Henry Gantt, one of project management's earliest pioneers, during his work as an engineer for the United States during World War I, displays interrelationships between tasks and the progress made toward the completion of an entire project with a bar graph format.[31] The GANTT chart is a sort of master calendar or schedule. Although quite simple, the GANTT bar graph is one of the most useful and accepted project management visual aids. One of the GANTT chart's major strengths is that it can be used in the management of both simple and complex projects. To do a good GANTT chart, one needs information from a work breakdown structure (WBS). A WBS is essentially a list of the tasks that make up a project. Once a complex project is broken into smaller pieces, a manager can estimate times for each task and assign people and resources to ensure each task's completion. A WBS helps a manager conceptualize the work of the project and divide it into distinct activities, tasks, and subtasks. The form enables the project manager to calculate time and resource requirements even more thoroughly. However, the GANTT chart does not show the logical relationships between activities because it is a time-based diagram.

¶36 Understanding the logical relationships between a project's activities is important because that knowledge helps the project manager and team plan the most efficient sequence of tasks for completing the project. Given the importance of charting interrelationships between activities, *two* methods of project tracking have become almost synonymous with project management—the Critical Path Method (CPM) and the Program Evaluation and Review Technique (PERT).[32] With these tools, the actual steps of the project can be diaried and compared with the planned work time. When planning a project, estimating the time required for each activity of that project is an essential threshold step. Normally, a single, fixed time is sufficient for plotting a project management master schedule. However, a level of uncertainty sometimes exists about a particular task, and the PERT

31. The GANTT chart is a bar chart which plots the progress of an activity. Bar charts do not display relationships between activities and are therefore limited in their utility. However, the GANTT chart is easy to read and easy to change.

32. The Critical Path Method (CPM), also known as the arrow diagramming method, was developed by Dr. John Mauchly, one of the EDVAC computer developers. CPM is a method of tracking the critical or essential tasks that must be completed in order for a project to succeed. CPM tracking was improved by Willard Frazer, a consultant to the United States Navy's Polaris submarine project during the 1950s, who developed the Program Evaluation and Review Technique (PERT). Through the use of PERT and CPM scheduling techniques, an arrow diagram of all of the activities necessary for a project's life cycle is created. The steps in the project's life cycle are displayed as events. Time lines and interdependencies between particular activities are integral ingredients of the graphical network. Best time and worst time scenarios, as well as time differentials resulting from unforeseen or intervening events, can be plotted using PERT and CPM arrow diagrams. For more detailed information about PERT and CPM, see HAROLD KERZNER, PROJECT MANAGEMENT: A SYSTEMS APPROACH TO PLANNING, SCHEDULING, AND CONTROLLING 643, 662–64, 667–70 (6th ed. 1998).

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method of calculating an estimate of time takes three time values—optimistic, normal, and pessimistic—to produce a time estimate that has a 50 percent chance of being either too low or too high.[33] The PERT/CPM chart is a relational diagram that is activity-oriented, demonstrates logical relationships between activities, and shows the critical path of a project.

¶**37** The scheduling tools and techniques developed by early project management trailblazers were translated first into mainframe computer programs and then, in the 1980s, into software packages.[34] Since then, project management software packages have proliferated and there are a number of good, user-friendly options on the market today.[35]

¶**38** The development of user-friendly software, such as Microsoft Project ManagerJ, has automated and demystified many of the statistical calculations that are necessary for complex project management. Whether or not to use software in the planning process of project management is an important question for information professionals.[36] With project management software, many of the charts and diagrams discussed earlier are available as report formats of the software package. When selecting an appropriate package, it is important to match the type of project and any special concerns with the software package's unique attributes. For example, if monitoring, controlling, and reporting on the project's budget are all-important, a package that has a good financial module and a good reporting feature is appropriate. Look for an uncomplicated user interface and flexible information input in a software package. Once informational data is entered, the user should be free to manipulate that data to create a number of different types of project management planning and monitoring tools, such as organizational charts; GANTT, PERT, and CPM charts; milestone charts; and WBS forms. The versatility that software offers in the planning process can make learning a software package a priority for information professionals serious about implementing project management techniques in their organization. With project management software, maintaining and disseminating accurate data about the process is more fluid, and it is certainly easier to create reports such as schedules, budgets, and time line changes for the various constituencies that will be interested in monitoring the project.

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33. When there is uncertainty about an activity, a probable time is calculated for that activity, consisting of: (a) optimistic or minimum time; (b) likely or normal time; and (c) pessimistic or maximum time. Optimistic time is the time that would be required for an activity if everything goes as planned. It is a best case scenario. Normal time is the time required to do an activity without perfection of all other variables. Finally, maximum time is the time that an activity would need if nothing in the project goes as planned. It is an estimate of a worst case scenario.
34. The Harvard Project Manager was introduced in 1983. Much of this background information about the evolution of project management was obtained from Marmion, *supra* note 3.
35. For a good review of some popular project management software packages, see Nelson H. King, *According to Plan*, PC MAG., June 30, 1998, at 209.
36. *See* Allen Allnoch, *Choosing the Right Project Management Software for Your Company*, IIE SOLUTIONS, Mar. 1997, at 38.

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Developing a Project Budget

¶**39** Once jobs have been planned and assigned to people and the time estimates have been made, the budgeting part of project management can begin in earnest. Although cost considerations probably have been in the planners' minds since the conception phase of the project, realistic predictions and negotiating usually only begin as the project matures.

¶**40** Budgeting involves more than plotting the financial needs of the project. The process of developing a project's budget, like other communication channels during the life cycle of a project, includes competition, negotiation, and politics.[37]

¶**41** The money allocated in a budgeting process depends on a complex interplay among the project manager, the organization's upper management, the clients, and the project team.[38] A project manager must keep the varying perspectives of these four different constituencies in mind. For example, the client may want a new service from an organization. In the case of most information service organizations, the client is usually a member of a user group, such as the general public, the organization's professional staff, or faculty and students. The upper management of the organization usually wants to accommodate the clients' needs, but is constrained by the organization's bottom line. Thus, the communication passing between the clients and upper management is an external negotiation over how much the clients will contribute to the project and how much upper management is willing to invest for long-term goals with these particular clients. The relationship between upper management and the project manager, which is an internal communication channel, focuses on the amount of resources necessary to complete the project successfully. The project manager is usually negotiating for the most that he or she can get in order to complete the project; upper management's negotiation posture, on the other hand, is to hold the budget line down as much as possible while still getting the project completed in order to satisfy the clients. During budget negotiations, a project manager and team may be asked to produce a feasibility study—an objective look at the project and a statement of what the money and resource needs are for the actualization of the project. A feasibility study should also examine whether it is cost-effective for the organization to take on the project at all.

Human Resources Management

¶**42** In addition to a project's technical planning, the human resources side of project management must be considered. As noted earlier, the project manager is in a rather delicate situation. The manager has the responsibility of leading the team members but may not have the apparent authority within the organization to do

37. *See* RALPH L. KLIEM & IRWIN S. LUDIN, THE PEOPLE SIDE OF PROJECT MANAGEMENT 62 (1992).
38. *See id.* at 62–63.

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so. The project personnel at the Biblioteca di Ateneo were fortunate to have a project manager who clearly had the support of upper management (in this case the library director).

¶43 To lead a project team, a project manager must vigilantly maintain communication channels among all interested parties, namely, the client, upper management, and the team members. The project manager leads the team by influencing and involving them, convincing all parties to "buy in" to the project's successful outcome. Focusing on the group's success instead of individual accomplishments is an ideal way to achieve a well-run, productive project management process. The manager should focus on cultivating and optimizing the team's human resources.

¶44 The three traditional measures of project success are schedule, cost, and technical performance.[39] Usually, the organizational reward system is set up for project managers who are able to bring technically successful projects to realization either at or below cost. However, the pressure to achieve the short-term goal of cost-containment could lead a project manager to adopt management techniques that might threaten a team's morale. By using true participatory management techniques and by implementing the long-term goals of team building, motivating an organization's valued work force, and employee development, a sterile project-based, "results at any cost" attitude can be avoided.[40]

¶45 In a service industry like librarianship, it is often difficult to measure management effectiveness because we information providers are not producing a product, we are providing a service. It is especially important for us to maximize our human resources and make sure that we focus on improving the quality of those services as we attain shared objectives. The participatory management principles inherent in project management's flat organizational structure offer librarians a more dynamic means of responding to change. Doing more with less in the face of fiscal pressures and unrelenting technological change and revamping our organizational structures has been touted as a challenge to libraries' endurance throughout the past decade.[41]

¶46 To empower project managers, who are really middle managers, to use the participatory management principles of team building and development, top management must be willing to alter the traditional project management reward paradigm. Doing so will help maximize the organization's human resource potential.[42]

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39. *See* Donald D. Tippett & David A. Waits, *Project Management and TQM: Why Aren't Project Managers Coming on Board?* INFO. MGMT., Sept.–Oct. 1994, at 12, 13.
40. *See id.*
41. For example, at an ALA Conference program about improving library effectiveness and coping with financial pressures and technological change, Jerry Campbell of Duke University Library noted that an organization's "efforts to change may be inhibited by an entrenched structure." *Conference Draws Record Crowd*, AM. LIBR., July 1995, at 654, 662.
42. *See* Tippett & Waits, *supra* note 39, at 13–14.

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¶47 To avoid symptoms of apathy and low morale among project team members, managers must endeavor to avoid the traps of insufficient communication, leader and worker mismatch, poor selection of personnel for the team, inadequately defined team structures, and role conflicts or confusion.

¶48 Just as the project manager uses cost reports, GANTT charts, and PERT/CPM network diagrams to report to upper management about a project's progress, it is equally important to report on the effective utilization and development of the human resources during the project's progress. In an organization committed to participatory management principles, feedback from all levels of the organization is crucial. The project manager must report to upper management with an assessment of the project team's health. Team feedback can be gathered during meetings between the project manager and team members. Although face-to-face meetings are an excellent way to communicate, they are often time-consuming and difficult to schedule. Tippett and Waits write about a "Team Fitness Report"[43] consisting of two parts: a traditional project performance report to upper management, using typical project management and performance parameters; and a "Team Health Survey," completed by team members, which gauges the team's health and allows for negative feedback. The survey evaluates the team's understanding of team-building techniques, the effectiveness of the project manager, and the team's enthusiasm and motivation regarding the project and its progress. Information from the survey empowers the team and the project manager to make changes and initiate improvements where and when necessary.

¶49 The people side of project management is very important because of the wide-ranging consequences that flow from the so-called "soft skills" of communication, team building, and maintenance of morale and motivation.

Planning Never Stops

¶50 Although planning is a distinct phase in project management, the planning function really continues throughout the life cycle of a project. Throughout the process—formalizing, prioritizing, and scheduling jobs; assigning tasks; deciding on checkpoints and milestones; and developing a budget—many unforeseen problems and changing circumstances are likely to arise and will need to be accommodated. A carefully managed project must have alternatives and fall-back positions built into its delineated scheme. Plotting flexibility into the process is just as significant as scrupulous planning itself.

Phase Three—The Implementation Phase

¶51 After the project's conception and planning phases, the most exhilarating and sometimes frightening phase arrives. Depending on how meticulous the planning,

43. *Id.* at 14–15.

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implementation is the make-it-or-break-it part of the endeavor. During the implementation phase, the project manager will be using the highest levels of both human and physical resources. At this stage in the project's life cycle, the budget will be spent, interpersonal conflicts and morale problems will surface, and time delays will happen. In short, this is where the true test of careful planning is most evident.

¶52 As the project develops, its monitoring and control are the concern of the project manager and project team. To successfully control a project, a manager must ensure that the project monitoring function continues and is sound. Throughout the implementation phase, the project manager and the project team compare the planned activities with the actual work to evaluate the project's progress. In the event that an anomaly occurs, having an alternative strategy ready is key. At the Biblioteca di Ateneo, for example, the project team had alternative sequencing patterns built into the rotational plan for which library department a new employee would train in first.

¶53 The ability to discern when to substitute activity or to redirect the project team's efforts with an alternative plan is an essential talent for a project manager. The ability to recognize a variance in the project's real life advancement from the project's blueprint and to then improvise an alternative is dependent on the reliability of the controls decided on by the project manager and team. For a substitute solution to work, the underlying discrepancy must be discovered in a timely way and the data collected must be accurate in order for the project manager's and the team's evaluation of the progress to yield good results.

Phase Four—The Termination Phase

¶54 The end of the project's life cycle, the termination phase, is also an evaluation stage. Assessment of the project's process and communication of the appraisal to all concerned parties is the final step in the project management life cycle.

¶55 At this stage, the project is judged as either a success or failure by the evaluative measures that were identified and established during the planning phase. At the Biblioteca di Ateneo in Trent, for example, the design for the employee orientation program was considered a success and became a permanent addition to the library's repertoire for new worker training. Because personnel from all levels of the various departments in the Biblioteca di Ateneo had been part of the project team that designed the experiences and the sequencing of training opportunities for new employees, the orientation program was effective in introducing new library staff to all aspects of the library's operations. Since the orientation program was not a topdown design, both management and staff were able to have input during the planning and implementation stages. At the termination of the project, the program was evaluated as superior to the former attempts at employee orientation programs. New employees understood the importance of

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their jobs within the larger context of the Biblioteca's mission. As a result, departmental supervisors felt the questions typical of new employees were far less superficial than they had experienced in the past.

¶56 Deserving project management team personnel are usually rewarded and return to their line jobs within the organization. The termination stage may be either a winding-down or a gearing-up for the next step depending on the unique situation of a particular project. Sometimes, a project is prematurely terminated because of problems or calamitous events, such as a lack of funding. It is always most satisfying to all concerned to finish a project when the project's goals have been met and the ending of the process augurs an optimistic future.

¶57 No matter what kind of termination a project faces, there should always be a formal, written report made to the project's stakeholders. This final audit should document all facets of the project management process and describe the team's triumphs and disasters. Examination of the process of the project's life cycle may provide an organization with important information to be used at a later date.

Conclusion

¶58 The strains on productivity in the information business are the same as those faced by other businesses. Increasing costs for resources and salaries, the challenges of technology, demanding users, and a rapidly changing work environment all create a critical need for flexibility and a less bureaucratic form of problem solving.

¶59 The traditional form of most organizations in academia and in the business world has been that of a vertical hierarchy. As we move into the twenty-first century, organizational responses to environmental challenges will have to be quicker, more elegant, and more spontaneous than those that top-down management can provide. Project management, with its flattened and impermanent organizational structure, is a versatile management solution that we should all look to in order to maximize our internal, and especially human, resources.

¶60 When planning the purchase of a new resource format, the installation of a new service, or the development of a building proposal, library and information center managers should explore project management as an effective means of managing the change in their organizations that will certainly occur as these projects go from idea to completion.[44]

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44. For more information about project management, there are a number of alternatives. In addition to widely available profession-specific information about project management, the Project Management Institute has long recognized and responded to the need for general, systematic project management training and information dissemination. The institute has developed a body of scholarship about project management that is available from its Web site. *Project Management Institute, supra* note 2.

Today a number of universities offer masters degrees in project management, and there are more than two thousand project managers worldwide. *See* JEFFREY K. PINTO & O.P. KHARBANDA, SUCCESSFUL PROJECT MANAGERS: LEADING YOUR TEAM TO SUCCESS 340 (1995).

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