

# Project Management

A Guide for Sustainable Entrepreneurs

**SUSTAINABLE ENTREPRENEURSHIP PROJECT**

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## **Project Management: A Guide for Sustainable Entrepreneurs**

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### **About the Author**

Dr. Alan S. Gutterman is the Founding Director of the Sustainable Entrepreneurship Project and the Founding Director of the Business Counselor Institute ([www.businesscounselorinstitute.org](http://www.businesscounselorinstitute.org)), which distributes Dr. Gutterman's widely-recognized portfolio of timely and practical legal and business information for attorneys, other professionals and executives in the form of books, online content, webinars, videos, podcasts, newsletters and training programs. Dr. Gutterman has over three decades of experience as a partner and senior counsel with internationally recognized law firms counseling small and large business enterprises in the areas of general corporate and securities matters, venture capital, mergers and acquisitions, international law and transactions, strategic business alliances, technology transfers and intellectual property, and has also held senior management positions with several technology-based businesses including service as the chief legal officer of a leading international distributor of IT

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# Project Management

## §1 Introduction

The members of any organization engage in a myriad of tasks and activities on a day-to-day basis. While each member has his or her own list of task responsibilities, the tasks and activities performed by various members are typically interrelated and require some level of collaboration. It is impossible to track and measure all of these activities without breaking them down into understandable units. One way of doing this is to look at the workflow within the company as various projects and to view the managers and employees involved into those projects as teams. If that approach is accepted it is apparent that project and team management are important subjects for any company and that the members of the company, particularly executives and managers, need to be trained in how to effectively design and implement projects and collaborate with one another in a team environment.

A set of tasks and activities that need to be performed are not necessarily a project regardless of how important they are to the organization or the number of members that might be involved. A project is indeed a set of tasks and activities; however, a project is more specifically defined as a temporary process to complete a clearly identified set of tasks and activities within a defined period in order to achieve clear and agreed upon goals and objectives. Projects are generally used for new or one-time efforts, such as development of a new product; however, once a project is completed certain aspects of the project activities may be incorporated permanently into the organizational structure. A project is a process that must be carried out in accordance with very definite requirements relating to time, resources and performance specifications of the outputs of the project. As such, a project must be “managed” to ensure that the goals and objectives are clear; that the process is well thought out; and that resource limits in terms of people, money, time, raw materials and equipment are observed and respected.

Project management encompasses all of the skills and tools necessary to effectively define, plan and execute projects. Project management is a tool for conducting and completing unique, one-of-a-kind projects or functions necessary for execution of the strategy of a company without disrupting what would otherwise be the normal workflow imbedded in the formal organizational structure. In general, project management creates and imposes a temporary management system over the normal organizational structure in order to accomplish a specific task or activity. Harold Kerzner, one of the leaders in research relating to project management, offers the following useful formal definition of project management that identifies key elements of the process: “Project management is the planning, organizing, directing, and controlling of company resources for a relatively short-term project that has been established to completed specific goals and objectives. Furthermore, project management utilizes the systems approach to management by

having functional personnel (the vertical hierarchy) assigned to a specific project (the horizontal hierarchy).”<sup>1</sup>

Planning, organizing, directing and controlling are four of the five functions or activities that are normally associated with traditional management and each of these are reflected in Kerzner’s definition of project management. Missing from the array of activities delegated to a project manager is the responsibility for “staffing,” which is the fifth activity that is normally associated with traditional management. The reason is that staffing remains a line responsibility and the project manager can only request resources while the final decision as to what, and how many, resources will be diverted to the project will normally be left to the line managers for each of the functions involved in the project. There are exceptions to this rule, of course, for situations when senior management intercedes and overrides the discretion of line managers to ensure that sufficient resources are diverted to certain mission-critical projects that must take priority over day-to-day tasks and activities. An example is creation of “project teams,” which are groups of specialists from throughout the company who are brought together on a one-time basis by senior management to collaborate on solving a particular issue or problem that is central to the company’s strategy and operational activities.

While project management pertains to relatively short-term projects, there is no hard and fast rule with respect to scope and duration. For example, engineering or construction projects may be as short as six months and as long as five years. Larger projects, such as the designing, building and launching a nuclear power facility or a state-of-the-art manufacturing plant, may take as long as ten years. For most small companies, however, short-term projects generally must be completed within three to twelve months since they are typically critical to the overall mission and strategy of the company and delays can be particularly risky to the survival of the company. Estimating the duration of a proposed project can be difficult in many cases since the actual scope of the work required may be impossible to determine until project activities are well under way. Moreover, project managers need to carefully guard against the possibility of unanticipated changes in the scope of the project that can lead substantial deviations from the original schedule as well as additional costs.

Since projects are, by their very nature, limited in scope, the participants must deal with specific constraints that will ultimately determine how the work of the project team is designed and scheduled and the specifications and value of the outputs of the work of the team. For internal projects, the relevant constraints include time, cost and performance. However, when the project is done for a customer, an additional constraint—customer satisfaction—must be added. Another thing to consider for customer-focused projects is that the customer is concerned only with results and has no real interest in how the company designs the way in which the project is approached and completed. Regardless of whether a project is internal or done for a specific customer, success will depend not only on technical abilities, and the availability of resources, but also upon the creation

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<sup>1</sup> H. Kerzner, “Project Management”, in C. Heyel and B. Menkus, *Handbook of Management for the Growing Business* (New York: Van Nostrand Reinhold Company, 1986), 424.

and maintenance of an organizational culture that values the cooperation and teamwork necessary for project teams to achieve their goals and objectives.

## §2 Forms of project management

It is possible to identify several different forms of project management, each of which raises unique issues with respect to project management techniques and cooperation and coordination between different departments and business units within the company.<sup>2</sup> The simplest form has been referred to as “fragmented,” or “partial project,” management and will be used in cases where project management is required only for a small portion of the activities of the company. A good example would be the use of project management techniques within a single department, such as marketing or manufacturing, while the remainder of the company continues to rely solely on traditional management tools. This type of project is relatively simple to execute given that there is little need to reconcile actual or potential conflicts with other departments; however, it is still necessary to understand some of the tools that are available to improve how the project proceeds. Moreover, the manager or employee within the department who is responsible for the project should be trained in basic communication, company and project management techniques to be sure that the project is completed on a timely basis and that the end result conforms to the expectations of all of the interested parties within the department.

Another form of project management is called “departmental” project management and requires that each department have its own project managers to oversee the department’s contribution to a larger project that must pass continuously through several departments. New product development provides a good example of how this might work. The process might begin with a project manager and project management structure in the research and development department. Once the project team in that department has completed its work the torch is passed to another project manager and team in the engineering department. This process continues through the manufacturing and marketing departments. While the advantage is that each department uses a formal process to manage and complete its main responsibilities with respect to launching the new product, the obvious disadvantage is that there is no single project manager with a stake in making sure that the entire project successfully moves through all the stages from beginning to end. The obvious response to the limitations of departmental project management is “task force project management” that includes designation of a task force leader who would be “responsible” for making sure that the entire project is completed.

Finally, companies engaged in project-driven industries such as aerospace, construction and defense tend to gravitate toward “matrix” project management structures. A matrix management structure for a project requires coordination between the project manager who is primarily responsible for the work flow and completion of the project and the managers of the various functional departments that have control over the resources that the project manager needs in order to complete the project. Advantages of this type of structure include access to the specialized resources developed and enhanced by the functional departments; however, the main disadvantage is the possibility that the

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<sup>2</sup> Id. at 425-426.

managers of the functional departments can withhold resources from the project and channel them toward other projects that have a more direct bearing on the performance and operations of the department. Companies using a matrix management structure for projects may adopt different variations that are based, in large part, on how power is balanced between the project and departmental managers and senior management generally needs to be prepared to actively intervene to ensure that the project is completed on a timely basis without undue disruption to departmental activities.

In each of the forms described above there is a project manager who is held responsible for coordinating the various activities that must occur in order for the project to be successfully completed. A project manager may deal with various employees when the project is confined to a single department or may interface with line managers from multiple departments when the project objectives require cooperation and resources from several otherwise self-contained departments. While a project manager is generally given substantial responsibility, as well as an impressive title, he or she is often at a disadvantage and, in fact, it is probably more accurate to say that the project manager works for the line managers rather than vice versa in most cases. While the project manager may be given a modest project budget, in general he or she does not control the resources required to complete the project and must negotiate with the line managers that control those resources for key inputs such as money, manpower, equipment, facilities, materials, and technology.<sup>3</sup> This means that project managers must have special training and interpersonal skills, topics discussed in further detail below.

### §3 Elements of project management

Project management literature identifies several key elements that must be taken into account when designing a project and creating and implementing a project plan: people, equipment and materials, time, cash and scope. Each element is important and all of them are interrelated, which means that decisions made with respect to one element will invariably have consequences with respect to one or more of the other elements. The most important of these elements, and the most challenging one to gauge and predict, is the scope of the project and, in fact, the success or failure of the leader of the project is largely determined by how well he or she is able to manage the scope of the project. Management of the project scope requires attention not only to the goals and objectives of the project but also to collection and proper deployment of relevant resources including people, equipment, raw materials, time and working capital. Every project is assigned limited resources and the project manager must identify and define the critical path to success so that the project is completed on time and within budget and renders results that meet the expectations of the company's senior managers.

The requirements for any project should be developed by the project manager with consultation from senior executives of the company, user groups and, if applicable, customers. It is recommended that the project manager create a formal project plan before intense activities begin on the project. In some cases the project plan is first prepared in draft form and presented to the members of the project team at the beginning

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<sup>3</sup> Id. at 428.

of the project to solicit their input and suggestions. Once feedback has been obtained, and potential conflicts have been resolved, a final project plan can be prepared and distributed to all of the members of the project team. The project plan should cover each of the key elements mentioned above and it is also useful to prepare a milestone schedule and a schematic that shows the logical structuring of the tasks and activities necessary to complete the project.

Project management is both an art and a science and successful project managers understand the technical tools that are available to assist them in planning and implementing projects as well as the needed to be flexible and innovative in order to deal with the unforeseen events that will inevitably occur regardless of how well a project has been charted and planned in advance. Some general guidelines for increasing the chances of success for projects include the following:

- The overriding goals and objectives for the project should be clearly defined and understood from the very beginning and the project should not be launched until the goals and objectives have been established and agreed upon by all involved parties. If possible, the goals and objectives should be capable of being described in a single sentence. If the goals are not understood it will be impossible to direct the project and all of the team members effectively.
- The needs and talents of each member of the project team should be carefully understood and each team member should have a good idea of his or her role in the project. The project manager needs to invest time and effort in building a team orientation among the participants and this means communicating with everyone about the overriding objectives of the team and how they fit into the strategic plans for the company. Project managers should take care of their team members and become advocates for the team in seeking and obtaining the resources that they need from the company.
- The project manager should establish and maintain solid relationships with each group within and outside the company that has a stake in the completion and successful outcome of the project. Internal stakeholders can provide valuable support for the project team including access to scarce organizational resources. External stakeholders, such as customers and suppliers, should be apprised of the goals and objectives of the project. In the case of customers it is essential to obtain their input since the most important measure of the success of the project is often the level of customer satisfaction with the outputs from the project activities.
- The temptation to jump into a new project simply to demonstrate that things are happening should be resisted and the project manager should not neglect the important, yet often tedious, task of carefully planning the project and creating a project plan with accurate budgets and reasonable timetables. If planning is not done at the beginning of the project it is impossible to stop along the way and determine whether a change in direction is required.
- While project managers certainly want to demonstrate the impact that they and their teams can have on the company it is prudent for the project plan to include reasonable, even conservative, projections regarding scheduling and budgeting so that expectations among the various stakeholders can be managed from the beginning.

For example, allowances should be made for contingencies, such as delays in obtaining necessary resources, which might occur during the work on the project. Setting reasonable goals, and then achieving them, allows the team to build confidence as the project evolves. If the project can be completed earlier and/or below the budget it will be a nice surprise for everyone involved.

- Many projects involve complex issues that must be tackled simultaneously and it is important for the project manager to break everything down into manageable bites that make it more likely that the team can resolve all of the issues and then aggregate the solutions in the most efficient way to generate the necessary project outputs. When building the schedule for the project the project managers should pay close attention to related activities and make sure that the work of one group of team members is aligned with the work of other groups so that work product can be quickly and efficiently passed along the critical path for the project.
- Assuming that the project manager has done the requisite planning described above, he or she needs to learn to trust the decisions made about budgeting and scheduling and stick to the path chosen at the beginning unless and until it is apparent that a major modification in the original plan must be made due to unforeseen events. The project manager should always keep the ultimate goals and objectives of the project as his or her primary target and resist distractions that will throw the project “off track” and cause confusion and deteriorating morale among team members.
- Obviously it will make things much easier if the original project plan survives the entire project with modification; however, changes in project scope and/or the strategy for completing the project are common and the project manager should develop and enforce a formal process for considering and implementing appropriate changes to the scope of the project and its overriding goals and objectives. Project managers should strive to be flexible, particularly when valuable new ideas are unearthed during the project, but should also not forget that each change in scope must be accompanied by a corresponding change in the budget and schedule.
- When creating the project plan provision should be made for early testing of key assumption that may have been made regarding the goals and objectives of the project and the means that will be used by team members to achieve those goals and objectives. For example, if the project team has been formed to work on a new product it is important to build in customer surveys and prototype testing fairly early in the schedule to make sure that the team is on the right track. If problems arise at that point changes can be made in the project plan so that valuable resources are not wasted pursuing something that customers will not purchase. Testing and re-evaluation should continue throughout the project.

Many of the guidelines describe above emphasize the need for project managers to carefully plan project activities and manage and control the resources assigned to the project. This is the “science” of project management that must be thoroughly understood; however, the best project managers are people who can also be pragmatic, flexible and adaptable and who are willing and able to intelligently “break the rules” in order to make sure that the project goals and objectives are achieved and that the outputs from the project are acceptable to internal and external customers. Project managers should have an open mind and be willing to listen to new ideas that may be offered by members of the

project team and other stakeholders. In many cases a valuable piece of information may have been missing when the original project plan was developed and project managers must realize that the best path can only be discovered by actually conducting the various work activities related to the project. Project managers must always keep the schedule and budget in mind but also be prepared to make changes in the plan to take into account new information.

#### **§4 --Scope of work**

The statement of the scope of work should identify the goals and objectives of the project, including specifications for the end result of the project; briefly describe in narrative form the work required to complete the project; and identify the material funding limits and other constraints (i.e., time). The length of the statement of the scope of the work will vary depending on the size and importance of the project and for small projects may be no longer than a couple of sentences. It is important, however, for the project manager to prepare a statement for all projects regardless of size because this is the best way for the manager to be sure that he or she has invested the time and effort to identify all the resources necessary for completion of the project and think through the most efficient way to manage those resources so that the project can be completed within the time and budget constraints established by the senior executives of the company.

The biggest potential problem for the project manager with respect to scope is the possibility—in fact, the probability—that the scope of the project will change as work proceeds and more information is obtained about desired results for the time and effort that is being expended on the project. In some cases changes will be required because the initial estimates of the work involved failed to take into account issues that were not foreseen at the outset of the project. In those situations the project manager may call for additional resources and/or more time to complete the project. A change in scope may also be necessary when new opportunities are identified during the initial phases of the project. For example, when the project team is working on development of a new product and is conducting preliminary customer surveys it may become clear that customers are looking for certain features that were not originally part of the project plan. In order for the project to be worthwhile and achieve the desired objective—development of a new product that meets the specifications of the target customer group—changes in the project scope must be made to build in the time and other resources necessary to incorporate the new features into the product design.

Changes in project scope are not, in and of themselves, bad things; however, from a project management perspective it is essential to track all changes, regardless of size, and to make sure that provision has been made for appropriate modifications to the resources that are committed to the project and/or the timetable for completion of the project. Changes generally present the project manager with several different choices. For example, consider the fairly common situation where a project team is working on the development of a new product and there is a desire to increase the functionality of the project beyond what was originally contemplated when the project plan was first formalized. In most cases everyone can agree that more functions will translate into a

better project that will be perceived as more valuable by customers; however, the project manager must be mindful of the restraints that inevitably bound each project—the schedule and the budget. If additional functionality is desired the project manager must either push out the schedule in order to build in the new functions or increase the budget to acquire more resources (e.g., people) to create the desired functionality without changing the target date for completing the project. Another alternative, which might alleviate the need for changes in the schedule and/or budget, is to eliminate non-essential requirements included in the original project design and focus attention on the new requirements. This approach should be selected carefully since too many design changes might have unforeseen consequences.

The risks and stress associated with a potential change in the scope of the project can be greatly alleviated by advance planning. If changes in the scope of the work, such as a modification to the design of a new product, are required the project manager needs to be able to respond quickly and obtain a decision as to how the changes should be implemented so that the support of stakeholder groups can be gathered for modifications to the schedule and/or budget that will impact the activities of other departments such as product launch planning and setting the price for the new product. One way to manage and control changes in the scope of the project is to implement a formal change management procedure that is completely understood by team members and all of the other project stakeholders. The change management procedure should identify what might constitute a change that must be approved, describe the steps that must be taken to consider and approve a change, establish who has the authority to accept or reject proposed changes, and describe how notice of changes will be disseminated and how changes will be integrated into the project plan. While change management should be approached seriously and formal rules should be put in place and followed an effort should be made to avoid being overly bureaucratic since this can have an adverse impact on the timetable for completing the project. Each change request should describe the proposed change and the reasons therefore. The person or persons with authority to approve or reject a change should be given a finite amount of time to review the change request; however, no decision should be made until sufficient information has been made available regarding the change. In many cases a “change review board” may be created that includes the project manager and managers from other involved departments who are in a position to evaluate how the particular change will impact the functionality of the product or process being developed during the project. Having specialty expertise available to review a change makes it easier to determine whether adjustments will need to be made to the schedule and/or budget if the change is accepted. If a change is accepted the team members should meet to discuss the change and identify what modification might be needed to the project plan and to their own specific activities. A record of deliberations on proposed changes should be maintained so that the impact of changes on the overall success of the project can be analyzed once the project is done.

## **§5 --Resource management**

The scope of the project dictates the various resources that need to be allocated to the project and which must be managed by the project manager. Resources can be broken

out into a number of different categories and each of them presents unique management issues. Generally the most important resources are “human,” including employees directly assigned to work on the project, people from other departments within the company who are expected to make contributions to the project activities even though they are not directly reporting to the project manager, and personnel from outside parties that provide inputs for the project (e.g., vendor employees and/or independent contractors providing services necessary for completion of the project). For each of these persons the project manager must track the amount of time spent on the project and the quality and efficiency of the services rendered in furtherance of the project. In addition, however, the project manager must be sure that he or she has access to the right people with proper skills and tools and the appropriate amount of human resources will be available at crucial times to ensure that project proceeds smoothly along the timetable that has been established in the project plan. Finally, the project manager is responsible for making sure that everyone involved in the project knows what they need to do and that they all are motivated to completely their tasks on a timely basis and at or above the expected level of quality and efficiency. Complications are likely to arise when there is a matrix organizational structure since employees assigned to a project may also be accountable to a manager in another department or business unit. In that situation the project manager must work carefully with the employee and the other manager involved to be sure that the requirements of the project are taken into account when the employee’s schedule is set.

It is tempting for project managers to seek a large pool of human resources to work on a particular project since there is an understandable hope that the more hands that are available the quicker the project will proceed. However, as the size of the project team increases the likelihood of bureaucratic delays and conflicts also goes up and the project manager will need to be prepared to spend additional time managing a large number of relationships between team members. In fact, it has been recommended that the preferred structural approach for a project team is to break up the team activities into smaller groups who can work autonomously. When the scope of the project changes and the project manager brings in new people to keep the overall project on the same schedule the manager must not forget the time and effort that should be spent on integrating new personnel into the team and making sure that they understand the overall goals and objectives and can work well with existing team members.

Other important categories of resources for which a project manager may be responsible include equipment and materials. The equipment will obviously depend entirely on the nature of the project and the project manager may need to arrange for equipment to be transferred from other departments or business units within the company or secure the equipment from an outside vendor through a purchase or lease arrangement. The management task for equipment is similar to that which applies for human resources—making sure that the right equipment is in place to perform the necessary activities on a timely basis and in accordance with the specifications set out in the project plan. Potential problems include making sure that maintenance for the equipment—including parts and other supplies necessary for operation of the equipment—can be obtained on a timely basis so as to avoid disruption to the schedule and, in the case where equipment is being obtained from internal sources, making sure that the usage of the equipment is

properly scheduled to avoid conflicts with other departments and business units and that costs associated with shared equipment are fairly allocated. With respect to materials, the project manager must be sure that the required materials are available when needed and that the price for such materials fits within the budgetary constraints for the project.

## **§6 --Time management**

All of the human and other resources that are made available for a project will not be effectively deployed unless the project manager is able to manage their utilization within the time period allocated for completion of the project. Time management is a critical skill in effective project management and project managers who are able to keep their projects on track are generally able to meet expectation with regard to keeping the project within the budget that has been set at the outset. Project managers can use sophisticated project management software programs that can be used for scheduling activities including keeping track of the status of resources and progress toward completion of the deliverables associated with the project objectives. However, in order for these programs to be effective the project manager must put together all the necessary information about the project including all the tasks that need to be performed to complete the project, how long each task will take, what resources will be required for each task, and in what order should all of the tasks be completed. With this information the software programs will identify the critical path to successful completion of the project and will also allow the project manager to conduct sensitivity analysis to determine the consequences of changes in any of the variables.

It would seem that a project would be relatively easy to schedule if there was sufficient time and resources to permit each task to be done sequentially; however, this is rarely the case and pressure to complete projects as quickly as possible will cause the project manager to focus on how several tasks can be carried out at the same time. This can be extremely challenging when the same resources, particularly people and equipment, are needed for two or more of the tasks that are being worked on simultaneously and the project manager will need to concentrate on setting and maintaining priorities to make sure that resources are deployed efficiently. Another thing to consider for each task is how much flexibility there is with respect to the starting and ending time for that task. The degree of flexibility is sometimes referred to as “float” and the more flexibility there is for a task the higher the float. For some crucial tasks there may be little flexibility (i.e., no float) and it is absolutely essential that those tasks begin and end on a specified date in order to maintain the overall schedule for the project. Other tasks, while still important, may have more float and can be moved around in the schedule more easily without jeopardizing the target completion date for all of the tasks. The critical path referred to above can be derived by drawing a line through all of the “zero float” tasks and the most important responsibility of the project manager is to constantly manage the critical path as the work on the project continues.

Time management not only involves sticking to the schedule set at the beginning of the project, it also requires flexibility and creativity in dealing with unforeseen events that may come during the course of the project. Obviously a change in the scope of the

project, as discussed above, should dictate a re-evaluation of the schedule. In addition, however, the project manager must be mindful of the impact that a change in the availability of resources might have on the timetable. For example, if the resources needed to complete a task that was not originally part of the critical path are delayed the task may need to be added to the later part of the path and the project manager may find that he or she needs to devote an unexpected amount of time to locating and collecting the necessary resources to get the task completed within the original scheduled period. On the other hand, a task that was originally designated as part of the critical path because the resources assigned to it were only expected to be available during a fixed window of time may be taken off the critical path if the resource constraints are eased or completely removed (e.g., the window of availability for the assigned resources expands because another project to which they were assigned is cancelled or the project manager is given access to comparable resources that provides the manager with more flexibility as to when the particular task can be done).

## **§7 --Budget**

While resource and time management are important factors in evaluating the performance of the project manager perhaps the most important criteria for determining the success of a project, assuming that it is finished reasonably close to the target ending date, is whether or not the project was completed within budget. Presumably the budget should not be a problem if the resources were managed correctly and everything proceeded in accordance with the original schedule; however, the project manager must nonetheless pay close attention to the critical expense items to make sure that the actual costs are in line with the estimates that were made at the time the budget was put together. For example, assume the original project plan estimated that a task would require the services of a particular independent contractor for 20 hours a week for three specific weeks during the project and that the hourly cost of the contractor would be \$100. If, once the project begins, the contractor bills for 40 hours a week at the same rate the total cost for the task doubles from \$6,000 to \$12,000 even though the resource (i.e., one contractor) has not changed and the schedule has not been disrupted because the task was completed within the agreed three week window so that subsequent tasks could start on time. The additional \$6,000 may or may not be a significant depending on the size of the project and the budget; however, the story does illustrate how potential issues with respect to the final cost of the project may arise.

Experienced project managers typically have a good grasp of the various types of direct costs that need to be taken into account when creating a project budget. The specific categories of costs will obviously depend on the particular project; however, a typical project budget might include all or most of the following: capital expenditures, which include significant assets that must be purchased outright in order to use in the project (e.g., equipment, buildings, software, etc.); lease and rental costs, including licensing fees, for assets that must be available for use in the project but need not be purchased; staffing costs, including all of the expenses associated with employees (e.g., salaries, benefits, recruitment costs and training expenses) and amounts paid to independent contractors engaged to assist the project team; professional services, including fees and

expenses of attorneys, accountants, engineers, architects and other outside consultants; and supplies and raw materials, which cover items that will be consumed during the project and no longer available for use once the project is completed. The budget might also include other “one time” expenses that are outside of the day-to-day operating activities of the company such as special training for all or a significant number of the team members on a topic that is specifically related to the project. Certain indirect costs may also be incorporated into the budget, at least for purposes of evaluating the anticipated return on investment for the project. For example, even though the expenses associated with telephone use by team members may be paid from funds outside of the project budget a portion of those expenses may be allocated to the project using an “educated guess” as to what percentage of the telephone use of team members is related to their work on the project.

While the project manager should certainly want to minimize the costs associated with a project whenever possible it is generally better for the company, and the manager, to be realistic at the very beginning and try and take contingencies into account when setting the budget for the project. Many of the items in the budget are based on good faith estimates of the actual costs and some estimates are more reliable than others. For example, hourly labor costs can generally be fixed although problems may arise, as described above, when the actual number of labor hours exceeds the estimate. Similarly, raw materials that are essentially commodities will typically be available at competitive prices and it is unlikely that unforeseen changes in the market will cause the cost of those materials to increase substantially. On the other hand, if the project calls for complex design work to create a new product with functionality that is “new to the market” it may be difficult to project the final cost of the design work with absolute certainty and some risk of a cost overrun must be accepted in order for the product to have the requisite level of innovativeness. In that situation, the budget should include a design allowance that can be tapped into if that phase of the project is more expensive than originally expected and the project manager should carefully monitor the work to be sure that the additional expense is necessary and worthwhile. As an additional incentive, the company may provide that the project manager will be rewarded if he or she is able to significantly reduce the amount of the design allowance that must be used.

For complex projects it is impossible for the project manager to watch every single expense item. The project manager should focus on those items that are most vulnerable to unforeseen changes and attempt to mitigate the damage that those changes can have on the budget and on the schedule for the entire project. For example, while it makes sense to negotiate a favorable price with a supplier for needed raw materials provision should also be made for alternative sources in the event that the original supplier encounters problems in meeting its commitment. If an alternative source is not identified the project manager may be forced to pay far more for the materials than originally budgeted and the project itself may fall behind schedule as the project manager scrambles to locate a new supplier and arrange for shipment of the materials. Also, as noted above, the project manager must beware of changes in the scope of the project that will increase the cost and should not agree to changes or expansion of the scope without corresponding modifications to the budget.

## **§8 Project documentation**

In order for a project to be approved, and for the stakeholders to be able to follow the progress of the project once it is launched, the project managers and other interested parties within the company need to prepare the appropriate project documentation. Larger companies typically have standardized requirements with respect to the paperwork that needs to be completed for activities that qualify as projects and a particular project may raise special issues that must be addressed in the documentation. In general, however, the documentation for a project will normally include a preliminary proposal; a requirements specification; a project plan; a budget, which is discussed above; a milestone schedule; and a description of the work structure for the project.

### **§9 --Project proposal**

Every project should begin with some form of project proposal that includes basic information regarding the project in sufficient detail for the appropriate person or groups within the company to make decisions about whether or not the project should be supported and funded through the allocation of resources. While it is often difficult to create a project proposal that has all the answers before the project activities have even begun, companies should nonetheless be able to provide their managers and employees with guidelines about what needs to be included in a proposal. A proposal is sometimes referred to as a “business case” and should include a short and concise summary of the goals and objectives of the project including the anticipated outputs from the project activities. The proposal should also identify a direct link between the project goals and objectives and the overall business strategy of the company. Supporting information should be included such as preliminary budgets and schedules. When the proposal relates to a new product the proponents should submit design information and reliable research data and other information that demonstrates that the proposed product will meet an identifiable need in the marketplace and that the company is positioned to successfully market and sell the product to the target customer group. It is common for the proposal to include information on the projected return on investment, or “ROI,” so that the proposal can be evaluated against alternative possible uses of the resources that would need to be set aside in order to complete the project.

### **§10 --Requirements specification**

In order to effectively plan the project and establish the appropriate goals and objectives for the project a requirements specification should be prepared. The specification provides a detailed description of the desired end result of the project activities and should be based on a thorough understanding of what must be achieved by the project team in order to satisfy the needs and expectations of the “customers” of the team. In most cases the requirements will be set before the project begins in order to ensure that the team will be focusing on the appropriate solution and that the correct resources are made available to the team. In that situation the process of creating the requirements may take the form of a “feasibility study” or “preliminary project analysis.” However, there

are also situations where the project is launched before the requirements have been firmed up and in those cases one of the first activities of the project team is to conduct the analysis necessary to identify the requirements for the project work. For example, the first phase of a product development project might include a detailed review of existing products and extensive interviews with potential customers to understand their specific requirements and elicit their opinions as to the performance features that would be perceived as having the greatest value in the marketplace.

Requirements can be broken out into two main categories—functional and non-functional. Functional requirements refer to the functionality and utility to the end user of the product or process developed by the project team. If the product or process does not help end users satisfy a need than the project has been a waste of time regardless of how well the project activities have been managed. The description of the functional requirements should be clear and concise and should include an affirmative statement of how the product or process will perform including important features that differentiate the new product or process from what is currently being used by the end user. Non-functional requirements cover just about everything else important about the product or process. For example, end users may have specific expectations regarding the performance of a product being developed by a project team (i.e., speed and reliability) and it is also generally desirable to select a design that is “easy to use” and which allows the end user to enjoy the benefits of the product or process quickly without extensive training or deviation from existing habits. Certain products and processes raise special issues with respect to security and compliance with legal/regulatory requirements. The requirements of external stakeholders must also be considered including conditions that investors or commercial lenders might impose on the use of the funds that are allocated to the project activities. Finally, consideration must be given to how availability of the new product or process will impact existing activities within the company (e.g., how will the new product impact marketing and sales for existing products).

During the process of specifying the requirements for the project input should be obtained from all of the key stakeholders including the senior managers of the company, representatives of the departments and business units involved in the activities relating to the project, external suppliers and the eventual end users of the product or process that will be developed during the project. Stakeholder involvement is obviously important for properly identifying and describing the functional and non-functional requirements; however, the preliminary discussions with stakeholders can also be an opportunity to get them to “buy in” to the success of the project and create lines of communication that can be used while the project is proceeding to gather additional feedback and resolve unforeseen issues that may have come up once the project work has begun. A number of tools can be used for gather information that can be used to create the requirements for a project including questionnaires, interviews and direct observation of how end users currently attempt to address the opportunity or problem that is the subject matter of project. Each tool has its own subset of methodology and the project manager should be creative when determining how information should be collected. For example, one-on-one interviews should be combined with group brainstorming sessions. The goal of the information collection process is not to have the survey group actually design the new

product or process but rather to provide the project manager with a full picture of the needs of the end user and how the end user perceived current solutions and the shortcoming associated with those solutions.

Once all of the information regarding requirements has been collected the project manager needs to evaluate the information and select a set of requirements that both meets the needs of the end users and fits within the constraints that have been imposed on the project with respect to resources and time. In many cases it is impossible to satisfy every wish of the end users without turning the project into something that is much larger and more complex than originally contemplated. In that situation the project manager should list all of the main requirements and order them with the most important requirement at the top of the list and the least important at the bottom of the list. This initial prioritization should be based on the opinions of end users rather than the amount of resources and time necessary for meet particular requirements. The project manager should then go through the list and identify the highest priority items that can be completed within the budgetary and scheduling restraints. Once that step is completed the project manager should provide all of the key end users with a list of which requirements are “in” and which have been set aside and the end users can provide their opinions on what items might be moved around once they understand that they cannot have all that they want.

The final step with regard to requirements is actually documenting the final decision that has been made by the project manager and approved by senior managers and other stakeholders. The requirements specification is an integral part of the project plan, which is discussed below, and should include all of the material functional and non-functional requirements stated in a clear and concise manner. The specification should also include a record of the steps taken to arrive at the final requirements and a description of how and why key decisions were made (i.e., why a particular feature was not included in requirements due to resource constraints). Each requirement should be realistic, given the resources available for the project, and should be accompanied by a means for measuring whether the end result of the project satisfies the requirement. Whenever measurement is needed the project manager should have a means for properly testing the product or process to ensure that it meets or exceeds performance-based requirements.

## **§11 --Project plan**

All projects, regardless of scope or complexity, should have some form of written project plan that can be used as a reference point for ensuring that the project is under control and is being managed efficiently. A project plan can not assure that everything will go as anticipated; however, it does serve as a foundation for breaking the entire project up into workable pieces, providing a reference point for all stakeholders and tracking the progress of the project against scheduling milestones and budgets established at the beginning of the project. The project plan can also be used as the basis for discussions among team members that focus on what may have happened since the last time that the team got together and what is expected to happen before the team has its next meeting. The process of preparing a formal project plan forces the project manager and other team

members to carefully review each activity and the proposed sequence for those activities and to consider the likelihood of events that might derail the project and generate contingency plans to mitigate or eliminate any risks to timely completion of the project.

There is no universal convention on the elements of a project plan, nor is there a consensus on the size and format for a plan; however, it is generally agreed that a project plan should, at a minimum, cover the following: the goals and objectives of the project, which generally are included in a statement of work or requirements specification; the schedule for completion of the work involved in the project including the target dates for finishing certain key interim steps (i.e., “milestones”); the resources that will be used for the project, which should include a list of key personnel and an overall budget that includes all direct costs associated with the project; and a description of how the end result (e.g., product or process) of the project activities will be delivered including any details regarding the process to be followed testing the end result to assure that it conforms to the performance criteria included in the requirements specification.

## **§12 --Milestone schedule**

As the name implies, a “milestone schedule” is timeline, with target dates, of the major milestones that need to be achieved in order for the project to be completed. Each milestone involves the completion of specified “deliverables” that are a byproduct of prior activities and which must be available to team members in order to proceed to the next stages of the project. The actual milestones will depend on the particular project and, for example, a project focusing on new product development might include the following milestones: design review meetings, completion of initial product testing, availability of prototype, completion of procurement and receipt of required licenses for sale of the product. Delivery and presentation of major written and oral reports to senior executives may also be included on the milestone schedule.

Obviously the boundaries of the milestone schedule are fixed by the amount of time that the project manager has been given to complete the project. While the milestones themselves are generally easy to recognize, setting the schedule can be extremely challenging since the typical project is broken down into multiple tasks and many activities cannot be started until earlier steps in the progression of the project have been completed. The project manager must determine how each of the tasks fit together, how long each of them will take to be completed, the degree of dependency between two or more tasks and the possibility of delays in completion of one of more crucial tasks that may upset the entire timeline for the project.

## **§13 --Work structure**

The description of the work structure necessary for completion of the project will depend on the specific project; however, the goal of the project manager in developing the description is to break the project down into manageable sub-projects stages that can be priced, monitored and controlled. For example, if the project is the introduction of a new product the project manager might segregate tasks and activities the sub-projects might

be identified as sales promotion/advertising, pricing, market test, manufacturing and training. In addition, the project manager should list the important tasks or activities for each sub-project. With respect to training for new product introduction the list of tasks or activities might include selection of salespersons, selection of distributors, training of salespersons, training of distributors, printing of literature, dissemination of literature to salespersons, and dissemination of literature to distributors. Note, of course, that activities such as dissemination of literature to salespersons and distributors cannot be done until the sales promotion/advertising sub-project is completed since that is the time when the relevant team members develop and finalize the literature.<sup>4</sup>

## §14 Risk management

As with many other organizational activities project management requires attention to risk management, which involves identifying events or issues that may present a serious impediment to successful completion of the project within the time and budgetary constraints included in the original project plan. For larger projects risk management may be a substantial issue and the project manager may actually designate a risk management officer to oversee the area. In most cases, however, risks can be dealt with more informally and managed through regular discussions among team members as they review the progress of the project and share information about unforeseen issues that may have come up during the course of the work. There are two main dimensions that can be used to categorize risks—the likelihood that a problem will occur and the impact that a problem will have on the successful completion of the project. Problems that are highly likely and which would have a significant impact on the project are considered “critical” and must be dealt with immediately. One example of a critical issue is a serious miscalculation in the scheduling of the activities for the project. Problems that are either “high frequency” and “low impact” or “low frequency” yet “high impact” are considered “major” and should be addressed sooner rather than later before they become critical. An example of what might become a major problem is the unexpected unavailability of key team members for extended periods of time. Minor problems (i.e., low frequency and impact) should not cause great concern but should be monitored to ensure that they do not become something more significant. For example, a supplier’s failure to deliver raw materials on time may be manageable if the project manager is able to locate a suitable substitute; however, repeated delivery failures by a supplier identified as key at the beginning of the project may eventually become a major, and even critical, problem.

Identification of potential risks is just the first step in the risk management process and the project manager, working in conjunction with team members, must develop an action plan that is appropriate for the type of problem and level of risk. In some cases the only option is to accept the risk and move forward with the anticipation that some form of short-term adjustments may be needed as the project evolves. For example, it is almost inevitable that key team members will be unavailable for short periods of time due to illness or unforeseen conflicts and such absences will need to be taken in stride. While the schedule may be thrown off a little bit lost time can generally be made up fairly

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<sup>4</sup> H. Kerzner, “Project Management”, in C. Heyel and B. Menkus, *Handbook of Management for the Growing Business* (New York: Van Nostrand Reinhold Company, 1986), 431.

easily. However, if a key team member is suddenly unable to work on the project—a “major” problem—the project manager better have a contingency plan in place to tap into alternative resources quickly so that the project can continue moving forward with minimal disruption. Some risks are totally unacceptable and must be eliminated even if it means increasing the budget for the project. An illustration of when this approach might be taken is when the success of the project depends on uninterrupted access to certain equipment and the project manager decides to purchase or lease a “back up” that would only be used if the first piece of equipment fails. Some risks are just too difficult to categorize, and the “manage,” without further information and in those cases the project manager may reserve further judgment until he or she, or members of the team, have done further research on the likelihood of a particular issue and the impact that it could have on the project.

### §15 Project managers

In the discussion above it is apparent that the focal point of activity regarding the design and implementation of a project is the “project manager” and it is not an understatement to say that the success or failure of a particular project often hinges on the selection of the project manager. In fact, project management has become so important that it has developed its own distinct career path within many companies and education and certification programs have been created to assist prospective project managers in learning and maintaining the necessary skills. There is always a temptation to recruit the project manager from outside the company in order to avoid actual or perceived problems of conflict of interest or loyalties to a particular function or department within the company. However, bringing in someone new may not be the best idea since the person would not be familiar with the way in which the company operates and others within the company may resent the newcomer and make it more difficult to complete the project successfully.

Smaller companies that do not have a steady stream of projects may tap one of the line managers to take on project management duties; however, line managers normally do not make good project managers given that they have built-in conflicts of interest and will also be distracted by their normal duties and responsibilities. In particular, if a line manager controls resources necessary for a project and also serves as the project manager he or she must often make difficult decisions regarding allocation of those resources between the project and the day-to-day functional activities that he or she is responsible for as the line manager. If at all possible, senior management should identify one or two persons from within the company who have the requisite skills and independence and assign them to full-time, dedicated positions as project managers. Assuming that these persons do not have conflicts of interest, this is the best method for ensuring that projects can be executed effectively and efficiently since the project managers can focus all of their attention on the projects and build and nurture the skills necessary for effective project management. This method works best when there is a steady stream of projects sufficient to justify allocation of resources to full-time project managers and it should be expected that project managers will handle several projects simultaneously.<sup>5</sup>

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<sup>5</sup> Id. at 427-28.

While there is a long list of desirable personal characteristics for a project manager, the two most important are communicative and interpersonal skills. Assuming that the project manager will be required to interact with managers and employees from all parts of the company, many of which have high levels of technical expertise, it is essential for the project manager to be a good communicator, poised and an effective integrator of divergent opinions and personal styles. In addition, the best project managers are able to balance technical solutions with the applicable constraints – time, cost and performance – and devote sufficient time and attention to planning and controlling the project. Finally, the project manager must be able to identify and resolve problems and make decisions and explain them clearly and thoughtfully to all parties involved and impacted by the decision.<sup>6</sup>

In order to be effective a project manager must also understand quantitative tools and methods, organizational structures and organizational behavior. Companies generally have a variety of quantitative tools and resources for planning, scheduling, controlling and monitoring work processes. Knowledge of structure of the company includes an understanding of how each line function or department operates so that potential conflicts between the responsibilities and goals of the project manager and each of the line managers can be identified and reconciled as soon as possible in order to allow the project to proceed smoothly and effectively. Finally, organizational behavioral issues focus on the conflicts that will typically arise for functional employees when they are required to simultaneously report to their line manager and to the project manager of any project to which they are assigned. In order to address problems from this dual-reporting structure senior management must ensure that managers and employees receive adequate training and guidance before imposing a project management overlay on to the day-to-day organizational structure.<sup>7</sup>

As noted above, many companies look within their own ranks to identify project managers and it is essential for managers to have experience in the specific technical and business environment relevant to the project so that they can appreciate the difficult issues that are generally involved in planning and executing projects. Employees interested in a management career often gravitate toward project management as a first step as a way to demonstrate their potential to senior executives; however, project management can be, and often is, a specialty that many find to be gratifying and fulfilling on its own. Project managers usually begin with fairly simple, small projects and if they are successful will be given opportunities to take on projects that are larger in size and scope. Project managers with a lot of experience may eventually oversee other project managers and provide them with mentoring and support with planning issues and obtaining the necessary resources for their projects. Project management training, including certification, is available through various companies such as the Project Management Institute. Certification requires specific project management education, a minimum number of hours of actual project management experience and successful completion of an examination on project management skills.

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<sup>6</sup> Id. at 427.

<sup>7</sup> Id. at 429.

## §16 Program management office

Companies that regularly use project teams should seriously consider creating a formal project management office (“PMO”) to support and encourage collaboration within the company and coordinate the simultaneous execution of mission-critical projects. For many companies, realization of their strategic goals and objectives, including timely development and launch of new products, requires a careful balance of multiple business objectives, most of which are inter-dependent with one another. If one or more of these projects fails to progress in accordance with the originally projected timetable, or within the resource budget that has been set for the project, companies can expect to encounter delays in product launches, dissatisfaction from investors, regulatory issues, and problems with cash flow and raising additional capital to complete the projects and begin new ones in the future.<sup>8</sup>

Since the PMO will be interfacing with multiple business units within the company it is essential that the PMO have visible sponsorship and meaningful support from senior management. In addition, senior management must be able to articulate and convey the strategic needs of the company with respect to bringing new products to market so that the PMO can align the project management activities with these strategic goals. When setting up the PMO, particularly during the planning stage, it is important to identify the relevant organizational stakeholders and ensure that they are committed to participating in, and the success of, the project management process. Visible senior management support is essential at this point to ensure “buy in” from the whole range of functional units within the company—research and development, supply chain, manufacturing, demand chain, finance, human resources, and legal/regulatory.

The PMO should be composed of an experienced team of skilled project managers who are prepared to take leadership roles for important projects selected by senior management. The ideal PMO leader should be able to articulate and discuss business and strategic issues at the highest level, including the ability to communicate on a regular basis with the board of directors; have demonstrated experience overseeing and managing large projects with activities that extend across the entire scope of the company; serve as a repository of project management expertise and as a catalyst for developing, documenting and implementing best practices in project management (e.g., models and standards); and have the technical skills and personality to rigorously and meticulously identify and track the key performance and financial indicators relevant to the progress of each project. Other important skills that will usually be helpful to the PMO leader include familiarity with concepts of organizational design and effectiveness and the ability to create and implement training programs. The PMO leader must also be able to deal with the whole range of stakeholders in a particular project including external parties such as vendors and customers. In lieu of an in-house leader for the PMO companies

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<sup>8</sup> The discussion of project management offices is derived from P. Allen, “Emerging Biotechs,” in *BioExecutive International* (October 2005), 18-19. See also M. Santosus, “Why You Need a Project Management Office,” in *CIO* (July 1, 2003).

may turn to outside consultants with special expertise in administering project management programs for firms in the same industry or market sector.

Assuming the company is involved in, or at least seriously considering, a number of projects within any given planning period, an important role and responsibility of the PMO can be to implement a formal project portfolio management system that can be used to assist the senior managers who are deciding between competing projects. Instead of the traditional approach to evaluating a project, which focused solely on a comparison of the costs of the project to the anticipated return-on-investment (“ROI”), portfolio management techniques are more robust and comprehensive and take into account various factors including not only the up-front costs of the initial project and ROI but also ongoing costs, strategic alignment and the risks associated with the project. The end result should be a portfolio of different projects which, taken together, offers the greatest rewards to the company in proportion to the level of risk senior management is willing to take. Portfolio management techniques also provide a powerful tool for evaluating the trade-offs between two or more competing projects that cannot all be undertaken at a particular time.

The first step in creating and launching an effective PMO involves assessment, articulation of goals and objectives for the PMO (i.e., a “charter”), and planning. Before moving forward it is essential for senior management, working in conjunction with all interested stakeholders from inside and outside the company, to create or expand the timetable that the company intends to follow with respect to all of the key projects that have been identified as necessary to achieve the company’s strategic goals and objectives. For example, when the PMO is expected to focus on project development activities the planning process should begin with a list of all the new products the company has decided to pursue and the target launch date for each product. The timetable must be comprehensive and complete and should include all of the key or high-level tasks within each of the projects and each of the critical milestones that need to be met in order to complete the projects on a timely basis. In addition, the timetable should incorporate other important dates that are likely to impact the decisions of senior management such as the expectations of investors regarding their own ROI. Using this information, and project portfolio management techniques, senior management and the PMO leadership can lay out a portfolio of projects (and execution plans for each of those projects) that are necessary in order for the company to achieve its overall financial and business goals and objectives.

Once the PMO has been launched the focus turns to continuous management of the projects that are currently underway, including monitoring and coordination, as well as planning for future projects that have been approved and assessment of completed projects in order to learn how the company as a whole can do a better job in the project management area. The PMO should also provide information and support to other departments. For example, companies are required to disclose information to regulators and investors regarding significant capital expenditures, including large projects, and the PMO should serve as the focal point for advising the accounting and legal functions about the progress of projects that are material to the business and financial condition of

the company. The PMO should itself be subjected to regular review and assessment and senior management should determine whether or not the PMO is achieving the desired objectives—increasing the success rate of projects as measured by how well the company is doing with respect to completing projects on time and within budget and implementing standardized project management techniques. Eventually the PMO should become the home base for the company's internal team of project managers and should be recognized as a resource for project management advice and training that can be accessed easily by other parts of the company.

### **§17 Challenges of project management for small companies**

Smaller companies, such as emerging companies in their early stages of development, typically lack the resources to fund a full-time project manager position for the entire length of a particular project. In most cases, the project manager has multiple responsibilities and also must discharge line management responsibilities at the same time he or she is coordinating a project. Obviously this creates a substantial risk of conflicts with respect to the time that the manager devotes to the project and how resources under the manager's control are allocated between a project and the day-to-day activities that the manager normally oversees. If possible, the responsibilities of the project manager should be limited to horizontal coordination of the activities necessary for completion of the project and line managers would remain focused on their vertical (i.e., functional) duties and lending the requisite support necessary for completion of the project.<sup>9</sup>

Due to the lack of resources, project managers in small companies are forced to juggle several projects at once and may encounter difficulties in planning and scheduling when there are significant differences in priorities among the projects. Resource limitations are also an issue with respect to what the project manager can expect to obtain from the functional managers in a smaller company. Unlike a larger company where the project manager can negotiate with functional managers during the course of a project to obtain more resources, smaller companies generally do not have any resources in reserve that can be redeployed to a project once it has been launched. Another resource-related issue is the lack of administrative support for project managers in smaller companies. Smaller companies generally do not have the separate project management office discussed above while larger companies, particularly in industries where projects are commonplace (e.g., aerospace or construction), may have a separate project support office or department with several full-time project managers and full-time administrative personnel to collect and organize information about the activities and procedures of the company that can be used in the project management process. Without this type of support the project manager in a small company must invest additional personal time in collecting information on top of the activities necessary to simply manage the project.

For smaller companies projects are generally much more mission critical for the success and growth of the company simply because smaller companies typically have fewer

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<sup>9</sup> H. Kerzner, "Project Management", in C. Heyel and B. Menkus, *Handbook of Management for the Growing Business* (New York: Van Nostrand Reinhold Company, 1986), 431-32.

projects and each of them represents a significant percentage of the company's activities. Therefore, the consequences of failure on a project are much greater for smaller companies than for larger companies that are able to spread their risk over a larger number of projects and customers. While success with a large project can vault the business of a smaller company forward much more rapidly, senior management must be rightly concerned about whether it will need to invest in additional resources or jettison smaller customers in order to take a chance on the large project. For these reasons, plus the fact that smaller companies are often slow to engage in wholesale delegation of authority, project managers in smaller companies can expect a higher degree of interference in the management of the project from senior management than is normally the case in larger companies. Since smaller companies have less resources to spare it is not surprising that project managers will be subject to much stricter monetary controls than those found in larger companies. Ironically, however, these controls may be more difficult to enforce unless the smaller company is willing and able to invest in more sophisticated control and monitoring techniques. They may have little choice when the project is driven by specific customer requirements since customers may expect that computer cost control procedures be implemented in order to generate financial reports during the course of the project.<sup>10</sup>

### References and Resources

The Sustainable Entrepreneurship Project's Library of Resources for Sustainable Entrepreneurs relating to Management is available at <https://seproject.org/management/> and includes materials relating to the subject matters of this Guide including various Project publications such as handbooks, guides, briefings, articles, checklists, forms, forms, videos and audio works and other resources; management tools such as checklists and questionnaires, forms and training materials; books; chapters or articles in books; articles in journals, newspapers and magazines; theses and dissertations; papers; government and other public domain publications; online articles and databases; blogs; websites; and webinars and podcasts. Changes to the Library are made on a continuous basis and notifications of changes, as well as new versions of this Guide, will be provided to readers that enter their names on the Project mailing list by following the procedures on the Project's website.

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<sup>10</sup> Id. at 432-33.