

7

Resource Management

Resource management is a rather broad category that can cover everything from product inventory to staff expertise to liquid assets such as cash. Resources can be broken down into five general categories: “physical things, energy, monetary value, information resources and various kinds of capabilities” [1]. While other chapters focus on IT asset resources and IT knowledge resources, this chapter will focus specifically on human resources assigned to projects. Project stakeholders are those individuals that have a stake in the success of the project. While the PM and the sponsor are the two most obvious ones, other stakeholders make up the project’s human resource pool. This pool could include the end users, the programmers, the vendors, the architects, the testers, and various other support personnel.

Traditionally, when one thinks of human resource management in an IT project context, they think of how to best leverage various skill sets, over time, on a single project. Elements such as team acquisition, scheduling, morale, motivation, training, productivity, and success are all things that a PM needs to consider when managing the human resources on a project. These same elements also serve as part of the

foundation for how an IT PMO will need to manage resources across multiple projects. If resources are continually pulled from one project and placed on another, the focus on their personal growth and training will get lost in the shuffle. Low morale will lead to unmotivated and unproductive project team members. While PMs now focus on maintaining the motivation of the resources on their own projects, will they also need to understand how past and potential future projects affect them? This is where the IT PMO can provide cross-project support and growth opportunities for project resources, and thus allow the PMs to keep their focus where it should be—on supporting project resources on their own project.

Supporting the morale of IT project resources across projects is a task required of IT PMOs in highly project-centric organizations such as IT consulting companies. In less project-centric organizations, this task is left to the resource's interproject, or functional, manager. Another resource management task that is common among IT PMOs in any organization is resource leveling. "Portfolio management is about resource allocation." If you squander scarce resources on the wrong projects, you can starve the truly meritorious ones [2]. In other words, as the IT PMO manages the aggregate project portfolio to satisfy the corporate strategy, it also needs to balance the company's finite project resources. With the IT PMO leveling the project resources across the portfolio, projects in the pipeline won't have to spend as much time competing for resources throughout the project's lifecycle [3, 4]. Ignoring political wrangling, PMs will more clearly understand whether they are worthy of a high-demand resource based upon the priority and the progress of their project.

The last two chapters showed how a PMO can centralize and help manage the more technical aspects of the portfolio through architecture and asset management processes. While these management tasks are embraced by leaders with technical backgrounds, it can be easy for an IT organization to mistakenly focus only on a portfolio's technical hurdles and goals. "The main reason we tend to focus on the technical rather than the human side of the work is not because it's more crucial, but because it's easier to do" [5]. This chapter will show that risks to the success of a portfolio reside in the management of project resources, as

well. The IT PMO can help projects acquire, support, and schedule internal resources to ensure a healthy portfolio. Also, when outsourcing is necessary, the IT PMO can apply some of the same concepts it uses in asset management to outsourced vendor management. Finally, we will review how the resource management team best fits into the project pipeline.

7.1 Acquiring Resources

As a project goes through the approval process, the sponsor (or the project proposer) should start building the project team (phase four of the initiative approval process). Starting with the project or program manager, the sponsors will usually seek out people they know have been successful in the past. But before the candidate can be assigned to a sponsor's proposed project, the candidate needs to be either free of project or departmental duties or have sufficient spare time to make part-time contributions. The sponsor will need to work with the project candidate's functional managers, whether they are other PMs or other functional business unit managers. Before approaching the functional managers, the sponsor should prepare or have answered the following questions for each candidate.

1. Are they available?
2. What is the relative priority of their current projects?
3. Are their best skills not being leveraged fully?
4. Do their matrixed managers want them to return quickly?
5. Who is lined up to grab them next?

7.1.1 Functional Managers

Typical project-oriented organizations follow a *matrixed* structure, where each resource reports to the project or program manager and to their assigned interproject matrixed manager (or functional manager). For example, a systems administrator (SA) or a database administrator

(DBA) may report to the director of infrastructure and the director of data support, respectively, for reviews and compensation. While a company's project list has a set of priorities, a functional manager has his or her own independent priorities that can prevent critical resources from being freed up. Therefore, when acquiring a resource, a PM needs to contend with not only the priorities of the project portfolio (via a portfolio resource manager), but also with the priorities of individual business managers that are responsible for the resources (see Figure 7.1). As projects come and go, resources may or may not become available, depending on the needs and the priorities of other higher priority projects and functional managers.

The IT PMO can make the functional manager's job easier by keeping the prioritized list of projects and initiatives up to date and visible not only to the executive committee but also to the business unit community. This allows the functional manager to make more informed decisions when agreeing to provide her resources to IT-based projects [6]. A more extreme approach as to how the functional manager fits into a highly project-centric organization would be "to alter the role of

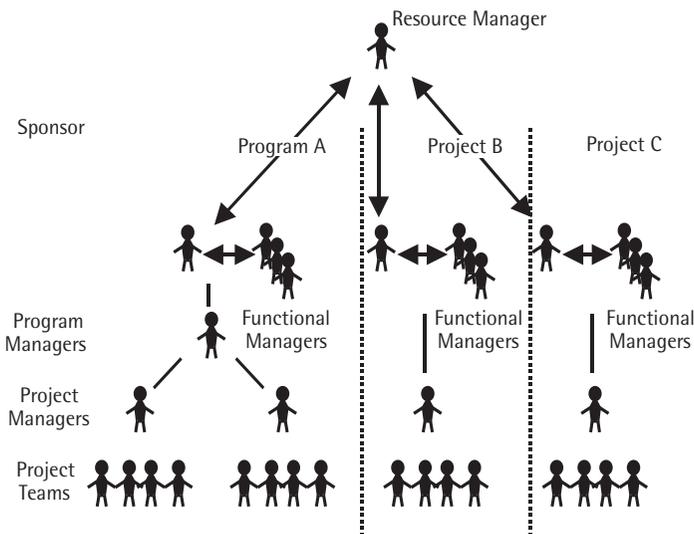


Figure 7.1 IT PMO resource manager with a clearer view of the portfolio than other managers.

functional managers from resource owners to project resource suppliers” [7]. PMs may successfully lobby to impose such organizational change on functional managers if they see a particularly negative trend, such as functional managers only providing those resources they don’t want in their department anyway [8]. If this latter approach were taken, then the IT PMO would need to take on more of the responsibility in supporting the career growth of the project resources. Whether the IT PMO acts as surrogate to or an enabler of the functional manager, strong communications need to be established with the business units to ensure smooth resource allocation.

Without smooth resource allocation, the project pipeline can get clogged. Many initiative selection committees don’t “consider the time-dependent resource requirements of projects, and most implicitly assume that all projects selected will start immediately” [9]. This is why phase four of the initiative approval process is so critical. Project sponsors need to understand the disposition of resources before the project is even approved. The IT PMO, with its awareness of this disposition across the entire portfolio, helps manage the uninterrupted flow of the approval pipeline [10]. For example, by not allowing projects to be added to the pipeline until resources are available to staff them adequately, the IT PMO has ensured that prepared projects won’t get denied access to asset, architecture, or knowledge management resources of the IT PMO.

Another way that the IT PMO can more efficiently clear up approved initiative traffic jams is through the use of resource management tools. IT tools exist that help show how IT resources are distributed by skills, across projects (see Appendix 7A for an example). If the IT PMO leverages such tools, it can remove itself as the default middleman for resource negotiations and be just a provider of up-to-date knowledge on resource disposition. However, there would be some cases where “two or more managers may be bidding for a potential project team member at the same time.” In this case, the IT PMO would need to have the authority “to say which manager requested a given person first or decide which project should get priority in staffing the desired person” [8]. To prevent business case writers from prematurely flagging the resources they may eventually need, the initiative review

committee should establish an initiative hurdle gate. For example, those initiatives that pass early review checks such as fundability, feasibility, and desirability can be allowed to flag, but not acquire, resources. Then, as the initiative gets closer to approval, the project sponsor will be closer to getting the resources needed for kicking off the project efficiently.

A common way to staff a project is to bring on few people in the beginning, then add the bulk of the staff in the second quarter of the project, and finally reduce the staff size as the project rolls out. There are several reasons why a PM follows this traditional bell curve of resource staffing on a project:

- ◆ They'd like to keep their turf wars over resources low until they can prove success with early pilots.
- ◆ Most skill sets aren't needed until later in the project.
- ◆ They'd rather wait for the best talent until it becomes available.

However, it may be better to focus on staffing the project well in its early phases and put less energy in staffing the project in its later phases. If battles for resources have to be fought, the PM should focus on negotiating for resources needed early in the project rather than later. These fights will become easier later in the project as future successes help validate the project's cause. Also, "even if that early staff allocation turns out to be wasted, your political situation may be safer with all those people on-board early than if you were to proceed leanly staffed through the first six months" [5]. This isn't to say that you should staff up the project to where many team members are sitting idly or, worse, slowing the progress of the project (e.g., the mythical man month). Rather, if certain critical resources aren't needed for several weeks, but are difficult to acquire, get them now rather than risk a last-minute, doomed-to-failure political battle.

Once a resource is acquired, the PM should stick with his allotted time for that resource. The reason for this is "if one project requires a resource more than expected, it affects other projects requiring that resource" [10]. The only way to audit this would be to validate that the resource is applying their core, highest demand skills to the project. The IT PMO audit team could include just such a check when conducting

audits of ongoing projects (see Chapter 10). If the PM has held onto a resource beyond the required need, the IT PMO will need to have the authority (and accountability) to distribute resources to mitigate the overall risk of the portfolio.

7.2 Supporting Resources

PMs who are beginning their careers will apply the project management knowledge they've learned in courses and from books. Following such project management standards helps guide the manager toward successful project completion. But the daily battles will rely just as much on the manager's leadership skills (e.g., team building, inspiration, vision). Such skills will help keep the team continuously glued together as a focused force. When applying such principles to interproject resource management, an IT PMO needs to ensure that resources and their functional managers feel comfortable about the direction their careers and their departments are moving, respectively. Just as a PM coordinates the team to move in the direction of project success, an IT PMO coordinates the organization to move cohesively in the direction of strategic success. Part of this coordination involves ensuring that resources receive fair and ongoing career support between projects. Such cross-project attention helps resources feel that contributions to any project, as well as to their departmental manager, carry just as much weight on their performance reviews.

To ensure that a project-oriented organization gets the utmost output from its personnel on projects, employees' performance evaluations need to also be tied to their work on projects. This means that project sponsors will need to also participate in a project member's career growth and not rely on their functional managers to fulfill all of these tasks. Sure, human resources lays out guidelines for peer reviews, management reviews, and career path templates. But, to support such long-term (usually annual) goals, PMs need to ensure that the resource will be a good asset to the project (i.e., happy, focused, motivated, and productive). The IT PMO can support the functional manager by ensuring the projects to which the resource is assigned map to the goals of the individual's career, as well as the goals of the company. Then, with such

multidirectional support from the organization, the resource can be held fairly accountable during their performance review.

7.3 Scheduling Resources

Scheduling resources on a project has always been one of the key challenges of a PM. Even when the PM has a good bead on a resource that they have worked with several times in the past, a personal crisis or an unforeseen technical hurdle can throw schedule estimates out the window. To account for such unknowns, the PM can use the common technique of adding buffers to the end of each major work package. For example, if the resource feels that it will take three days to complete a task, the PM will add it as a four-day task to the project plan. The extra day is an *implicit* buffer, or an increase in the duration of a task just to account for risk. Another method of adding time buffers to a project is shown in Figure 7.2. Here, a program of dependent projects has *explicit* time buffers added to the end of some critical release iterations in each project. These buffers, which are a part of the project plan, act as a secondary level of schedule risk mitigation. Combined, both types of scheduling buffers can help keep projects on a planned schedule and, thus, reduce the overall risk for failure.

The challenge in leveraging the buffer management style of project scheduling is in where to best place the buffers and in deciding how big to make them. Most PMs introduce time buffers using three different

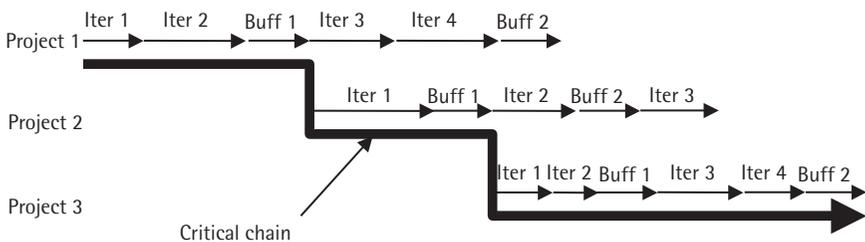


Figure 7.2 Critical path example using three projects, each with multiple iterations.

mechanisms. The first one is that estimates should be based on pessimistic views of past experiences. The second is that total estimation should increase in direct proportion to the number of management levels involved. Management layers are the roots of bureaucratic slowdowns for any project. And the third is that estimators also protect their estimations from a global cut made by executives. For example, many times upper management will request a cut in schedules by 20% across the board. To anticipate this, estimators will add an additional set of buffers that increase the project duration by 20% [11]. As with corporate earnings, project duration estimates are judged by how accurately they match reality. Estimators can be just as scrutinized for overestimation as they would be for underestimation. This desire for accuracy helps keep project sponsors from requesting drastically more time than is needed in business cases.

Another method PMs use when scheduling projects is the critical path approach. Projects can have bottlenecks when certain tasks in a project cannot begin until other tasks have completed. If not scheduled properly, this can lead to idle resources and delayed releases. Critical paths can also exist in a larger scale scenario such as a program of dependent projects. For example, Figure 7.2 illustrates a critical path scenario where project 2 can't begin until iteration 2 of project 1 has completed and where project 3 can't begin until iteration 1 of project 2 has completed. The PMs will not eliminate all unforeseen timeline problems through buffer management and critical path awareness, but they can reduce them.

7.3.1 Drum Resources

When multiple projects share a constraint resource, such a resource is referred to as a *drum resource* (because the projects tend to go by the beat of the drum of that resource). Drum resources are usually identified as those resources where demand for a particular skill outstrips supply. Seasoned IT PMs are experienced with the bottlenecks that certain drum resources can create: SAs, DBAs, and IT operations are all well-known examples. The ideal position for such an organization is to have the supply of drum resources slightly in excess of the demand. "This then gives the organization some contingency to deal with the

unexpected” [12]. By better scheduling and staffing these drum resources between projects, the IT PMO, the PMs, and the functional managers can ensure that less time is wasted on lead or warm-up time.

Many PMs handle drum resources’ time by requesting that they distribute their workload across projects and document the percentage of time they are spending on each project. “Firms in shorter-term projects and dynamic markets” lean more toward this flexible resource model of allowing resources to multitask [2]. Unfortunately, such fragmented time “is guaranteed to waste the individual’s time” and results in long delays in product launch, which can lead to lost revenues [13]. A worker with multiple cross-project assignments will spend a large amount of time each day readjusting to each new task on different projects [5, 11]. Instead, the resource should be scheduled to complete one full task on one project before shifting to another task on another project. Generally, companies with a longer term perspective tend to take this latter approach.

Once initiatives and projects are prioritized by the IT PMO and once the resource manager understands which drum resources will be needed by which projects, a central drum resource schedule can be developed and maintained. Before a PM develops his project schedule, he should be aware of when the drum resources are being used by other projects. To help reduce resource contention, project schedules must be synchronized to this central drum resource schedule. In essence, the project pipeline “becomes a pull system because the drum schedule determines the sequencing of projects” [14]. Projects get pulled into the pipeline if drum resources complete tasks on other projects early. For this reason, projects add buffers to guard against another type of risk: drum resource availability. Such buffers need to overflow before and after the desired start time of the drum resource. This allows for flexibility in the usage of drum resources that may become available early or late [14].

An estimator should not buffer the end of each task on a project; rather, she should buffer the beginning of those tasks that require the drum resource [11]. Transferring the buffers in this way not only increases pressure for noncritical task completion, but also mitigates the risk of other projects not releasing a drum resource when scheduled.

Such buffers are called *capacity buffers*. In reality, the noncritical path buffers shouldn't really be removed from the project. Rather, they should be tacked onto the projectwide buffer at the end of a project. As unforeseen events cause tasks to take longer than scheduled, corresponding blocks of time should be removed from the project buffer. This allows the PM to focus his stress on those tasks that reduce the project buffer. Secondary focus should then be placed on those tasks that are not yet affecting the project buffer but are consuming part of the capacity buffers [11] (i.e., other projects that might affect the PM's project schedule).

7.3.2 Critical Chain

Figure 7.3 shows the critical paths of three projects that have been prioritized and scheduled without the guidance of a central drum resource

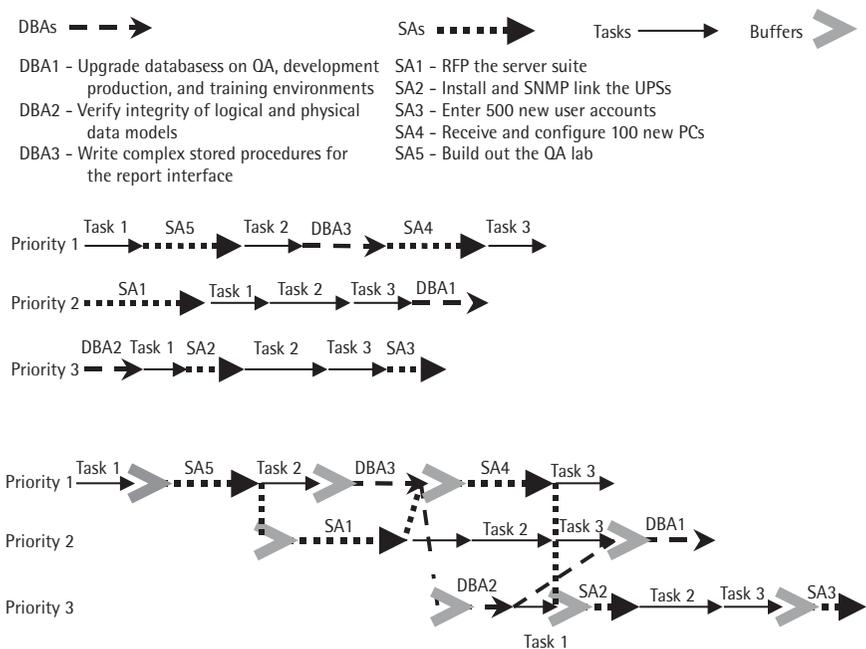


Figure 7.3 Critical chain example using one SA and one DBA as drum resources.

schedule. This example shows two types of tasks that need to be completed by drum resources: DBA tasks and SA tasks. If these schedules were allowed to stand, then PMs would be spending much of their time battling for use of the resources. In order to remove a contention for a resource, the project sponsor will need to consider postponing one of the tasks [11]. To help decide how to best delay project tasks or alter the project kick-off dates, the IT PMO will need to work with the functional managers of these drum resources to develop drum-dependent schedules (the third box in Figure 7.3). The second box shows how a project schedule can then be altered by showing how drum resources are scheduled on other projects and how projects are prioritized by the IT PMO.

The critical paths of the first box in Figure 7.3 are bridged by what Eli Goldratt, author of “Critical Chain,” refers to as the drum usage, the buffer protections, and the interproject ropes (drum-buffer-rope for short). By eliminating fragmented drum resource allocation, a PM can feel more confident that when given a drum resource for a given amount of time, the PM will have 100% of that resource’s attention until the scheduled task is completed. The path the drum resource takes between projects is the rope that shows the interdependence of each seemingly decoupled project. These drum resource ropes between project critical paths are referred to as the critical chains of the project portfolio. By managing these ropes, the corporate drum resources, and the project buffers, an IT PMO can help prevent projects from stumbling over each other after they are approved and financed. (The AARK Management PowerPoint presentation in the accompanying CD-ROM provides an animated version of Figure 7.3. There is also a listing for a company that provides critical chain project management software in the PPM software section of the CD-ROM.)

7.4 Outsourcing

One reason companies can get disenchanted with out-of-control and unwanted IT deliverables can be a lack of control over IT and strategic outsourcing. Companies may hire management consultants to help develop corporate strategies and business initiatives, and they may hire

IT services companies to run IT projects. While this is necessary in many cases due to a lack of resources and experience, many companies use these tactics more than they should. Because outsourcers are under extreme pressure to complete a project, they tend to recycle past successes into new projects to help in reaching deadlines on time. To tip the balance of risk mitigation more in their favor, outsourcers prefer to install the same “canned” solution they did for your competitors. “The more a company uses outsourcing as a competitive thrust, the more likely it is that its competitors will copy its strategies and move to an equitable market position” [15]. If a company wants a custom solution, it better be prepared to spend quite a bit more money on deliverables and a lot more time on contractual details.

Chapter 5 showed that to meet the demand of the technical initiative portfolio, internal IT departments and external IT companies had to provide a supply of technical solutions. The main test that would determine which of these two IT groups supplied what percentage of the solutions is known as the *yellow pages test*. This test states that “when shared service units cannot outperform external competitors, companies should outsource these functions” [16]. Where Figure 7.4 illustrates a majority of business units “going it on their own” with their technical initiatives, Figure 7.5 shows a diminished reliance on

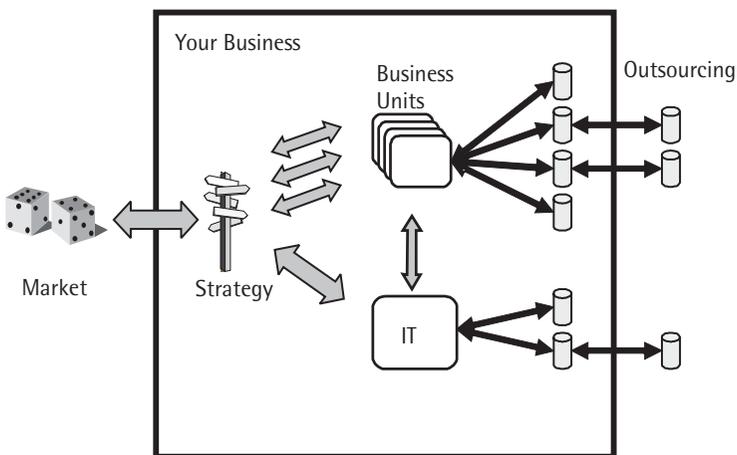


Figure 7.4 Business units that bypass IT resources for outsourced resources.

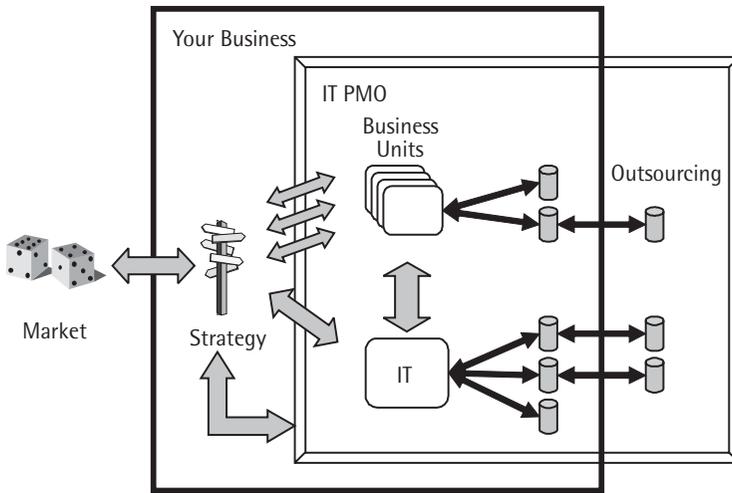


Figure 7.5 IT PMOs can draw attention to and better manage resources to avoid unnecessary and expensive outsourcing.

outsourced companies with the added support of an IT PMO. That is, the IT PMO helps replace the company's reliance on the yellow pages.

While the IT PMO not only provides better visibility into the health of the portfolio, it also helps improve and maintain the health of the portfolio. Moreover, the IT PMO acts as a marketing wing for the IT department. Too often a business unit will bypass valuable IT department resources for less-than-qualified outsourcers. While many outsourcers are experts, project sponsors can save considerable costs if they first sought and then found equitable expertise in the IT ranks. For example, outsourced IT companies are known for the motto "We get IT done"—the notion being that they are sure your IT department isn't living up to its potential. "Hundreds of millions of dollars" are being invested by outsourcing companies to shake the confidence in IT departments among business units [17]. The IT PMO won't discredit outsourcing, but would instead act as a broker of outsourcing vendors and IT resources. Even IT resources may, in turn, outsource some tasks required of them by business units. In this way, project sponsors will be more aware of which resources are available from within the company before they go shopping for resources outside the company.

There has been a recent upsurge in the desires of executive staffs to outsource IT projects to eastern European, Indian, and South American companies. Lured by the bait of lower wages, business units can overlook the many layers of risk (i.e., unforeseen costs) inherent in IT-based outsourced projects. But do the new risks associated with remote development outweigh the benefits of reduced costs of wages? Where costs can add up in travel, cultural training, project monitoring, and avenues for litigation, can companies break even with the lower costs of wages? However the costs balance out, the IT PMO is in a perfect position not only to communicate all risks and costs posed by remote outsourcing vendors, but also to require adherence to the same hurdle gates (audit points) imposed on in-house projects.

7.5 Summary

When a project sponsor wants a particular resource for his project, he needs to understand (1) whether that resource is being used in another project, (2) whether the resource's functional manager is willing to let the resource go, and (3) whether the resource will be satisfied and productive on the project. The IT PMO can help each IT-based project resolve all three of these preconditions. With the aid of the IT PMO's resource manager, a project sponsor will be able to more easily acquire and schedule resources that are used across projects. The resource manager will also help ensure that the resources are supported in their career development between projects. Figure 7.6 shows that as the business case goes through the approval process, the project sponsor can negotiate and then acquire resources from other projects or from functional managers (path 1). Resources (e.g., drum resources) can also be acquired in the middle of a project (path 2). We can see from the figure that both business units and the IT department provide the supply of drum resources. Then, as a task ends, drum resources are returned to the central pool to be used by other projects (path 3). Drum resources are those that are in high demand and require a central schedule maintained by the IT PMO. Using drum-buffer-rope scheduling techniques, the PMs can get a better handle on the critical chains of their projects.

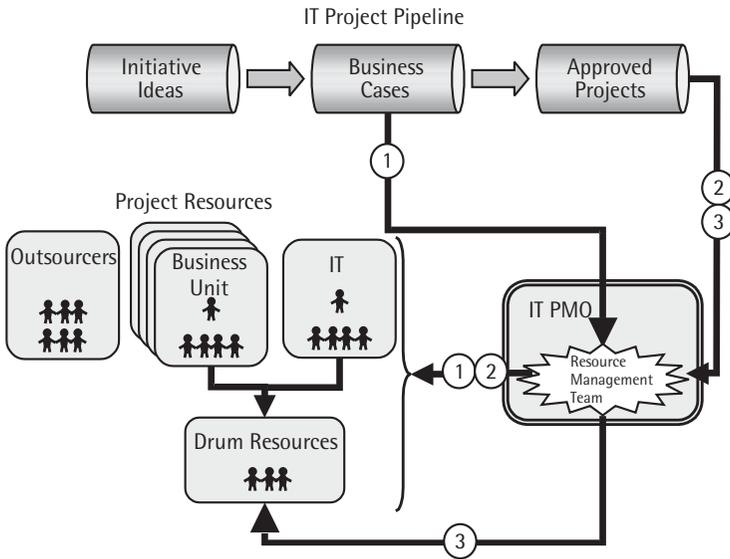


Figure 7.6 Virtual IT PMO—resource management team view.

This in turn leads to efficient resource leveling (usage) and to reduced initiative bottlenecking across the portfolio.

References

- [1] McDavid, D. W., “A Standard for Business Architecture Description,” *IBM Systems Journal*, October 7, 1998 (electronic version).
- [2] Edgett, Scott, Elko Kleinschmidt, and Robert Cooper, “Portfolio Management in New Product Development: Lessons from the Leaders, Phase II,” in *Project Portfolio Management*, Lowell D. Dye and James S. Pennypacker, (eds.), West Chester, PA: Center for Business Practices, 1999, pp. 97–116.
- [3] Spring, Steve, Beebe Nelson, and Bob Gill, “Building on the Stage/Gate: An Enterprise-Wide Architecture for New Product Development,” in *Project Portfolio Management*, Lowell D. Dye and James S. Pennypacker, (eds.), West Chester, PA: Center for Business Practices, 1999, pp. 87–96.
- [4] Elkins, Tony, “Resource Management on an E-Commerce Project,” 2002, <http://www.gantthead.com> (last accessed on January 15, 2004).
- [5] Lister, Timothy, and Tom DeMarco, *Peopeware: Productive Projects and Teams*, New York: Dorset House, 2000.

-
- [6] Kutoloski, David M., and C. Thomas Spradlin, "Action-Oriented Portfolio Management," in *Project Portfolio Management*, Lowell D. Dye and James S. Pennypacker, (eds.), West Chester, PA: Center for Business Practices, 1999, pp. 261–270.
- [7] Crawford, J. Kent, *The Strategic Project Office*, Monticello, NY: Marcel Dekker AG, 2004.
- [8] Abramson, Gary, "Matchmaker, Matchmaker," *CIO Magazine*, October 15, 1999, http://www.cio.com/archive/enterprise/101599_hr.html (last accessed on January 15, 2004).
- [9] Ghasemzadeh, Fereidoun, and Norman Archer, "An Integrated Framework for Project Portfolio Selection," in *Project Portfolio Management*, Lowell D. Dye and James S. Pennypacker, (eds.), West Chester, PA: Center for Business Practices, 1999, pp. 117–134.
- [10] Englund, Randall, and Robert Graham, *Creating an Environment for Successful Projects*, San Francisco, CA: Jossey-Bass, 2001.
- [11] Goldratt, Eliyahu, *Critical Chain*, Great Barrington, MA: The North River Press, 1998.
- [12] O'Connell, Fergus, *Successful High-Tech Project-Based Organizations*, Norwood, MA: Artech House, 2003.
- [13] Khurana, Anil, and Stephen R. Rosenthal, "Integrating the Fuzzy Front End of New Product Development," in *Project Portfolio Management*, Lowell D. Dye and James S. Pennypacker, (eds.), West Chester, PA: Center for Business Practices, 2000, pp. 339–362.
- [14] Leach, Lawrence, *Critical Chain Project Management*, Norwood, MA: Artech House, 2000.
- [15] Cleland, David, "The Strategic Context of Projects," in *Project Portfolio Management*, Lowell D. Dye and James S. Pennypacker, (eds.), West Chester, PA: Center for Business Practices, 2001, pp. 3–22.
- [16] Norton, David P., and Robert S. Kaplan, *The Strategy-Focused Organization*, Boston, MA: Harvard Business School Press, 2004.
- [17] Low, Lafe, and Sarah D. Scalet, "Come Together," *CIO Magazine*, December 15, 2000, <http://www.cio.com/archive/010101/together.html> (last accessed on January 15, 2004).

Appendix 7A: Case Study—Siemens Building Technologies, Inc.—Automating Resource Management

Siemens Building Technologies, Inc., a subsidiary of German conglomerate Siemens, Inc., was seeing the majority of its projects come in late. Some even took six times longer than the original estimates. Combining this with a large number of employee complaints of being overworked, management realized that they weren't managing their resources well. The most valuable experts in the company were being split between so many concurrent projects that the company risked not only project failure, but also diminished returns from the embittered employees. To resolve the problem, IT manager John Braun installed a new application called Business Engine to better manage human resources across the project portfolio.

Employees and managers can update skill sets and availabilities into Business Engine so project sponsors will be better aware of the internal resources they can use. Such knowledge allows the business case writer to better understand whether she will need to outsource certain skill sets for different phases of the project. Another valuable feature of Business Engine is that it allows prospective project sponsors to view the resource bottleneck in real time. Before initiatives are approved, project sponsors can place tentative bids on resources to help streamline project launch upon financing. As long as such flagging of resources has imposed time limits, proactive resource management can reduce confusion and conflict between projects over resources.

So far, Business Engine is managing over 400 subject experts between 300 projects across 22 departments. Because these experts come from four different subject areas, the central project management body (e.g., IT PMO) needs to coordinate resource availability entries with the functional managers as well as with the PMs. Without such a tool, communication between all of these managers would end up becoming a tangled web of voice messages and e-mails. For large, international companies like Siemens Building Technologies, automated resource management tools such as Business Engine are essential to a smooth-running project pipeline [8].