

Meeting the Challenge of Multi-Project Management

Managing multiple people on multiple projects

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When *I* use a word,” Humpty Dumpty said in a rather scornful tone, “it means what I choose it to mean – neither more nor less.”

Lewis Carroll

Through the Looking Glass

Introduction

In the world of white-collar work, “multi-project management” means different things to different people. To the chief executive officer, it means six-sigma process improvement efforts, accelerating cycle time, competitive products in a strong strategic portfolio, and increased profits. To the engineering vice president in charge of new product development, “multi-project management” has overtones of strategic portfolios, production ramp-ups, market projections colliding with manufacturing costs, and “break-even time” analysis. To the chief information officer, it means internal customers quarrelling about whose need is the most urgent. To the head of the marketing department, it means a staff being asked to split time between the corporate-sponsored process improvement efforts and their regular work demands. To the project manager, it’s a noisy, contentious environment where other projects steal your key people.

To the individual white-collar, professional who is dividing time between two projects, “multi-project management” means juggling appearances to keep two bosses happy at the same time. The closer you get to “multi-project management,” the more difficult it looks. It challenges everyone in the organization – and those actually splitting their time between several projects have the biggest challenge.

The most common form of divided time management for the individual professional is not even “multi-project,” it is “multi-assignment” management – dividing time between a regular, functional job and a special, temporary project.[1] A work assignment can be either a regular job activity or a project task. The project work usually extends beyond the boundaries of the regularly defined job.

In order to respond to the challenge of “multi-project management” we will dedicate the first half of the chapter to solving this most common problem, “multi-assignment” management. We will begin with the *knowledge worker assigned to both a regular job and a temporary project*. The solution to the simple form of this common problem should point the way to the solution of the more complex cases of multi-project management. If

we can solve the problem for the knowledge worker, we can specify the minimum requirements for what the white-collar organization must do to support the worker's needs. In the second half of the chapter we will explore how these minimum requirements may be turned into "just enough process" to meet the challenge of multi-project management. So just how does the individual knowledge worker successfully balance a regular job and a temporary project?

The Challenge to the Individual

We ought to give the whole of our attention to the most insignificant and most easily mastered facts and remain a long time in contemplation of them until we are accustomed to behold the truth clearly and distinctly.

Rene Descartes

Rules for the Direction of the Mind

From "Interruption" to Work Assignment

For this discussion, we will adopt a simplifying rule of thumb and say that a small project, one that requires less than 20% of your time, can be handled as an "interruption" in the normal give and take of a regular job.[2] (If you find 20% too large, supply your own boundary for when assignments become "interruptions.") Our knowledge worker's balancing problem begins when the project's work grows larger than four days a month. (If several small fragments of projects are being worked on, then they can be bundled together under the heading of "small projects" and treated like a single project of some size.)

If a month contains twenty workdays, a large project might, in an extreme case, claim as many as sixteen days. If the project's demands grow even larger, then the balancing problem disappears and the month transforms itself into a "project month" with a few "interruptions" from the regular job. By using the "20% rule of thumb" we can focus the problem of "balancing two assignments" on a month where each work assignment takes between four and sixteen days.

So, for the moment, our knowledge worker begins with a pile of work that totals no more than twenty days of work for the month. The work is split between days of project tasks and days of regular job activities.

Pick-Up-Sticks Planning

If you are a knowledge worker, planning your work can be like playing a grown up game of pick up sticks. You circle the pile of work, sizing up the pieces, looking for a good piece to start with. After the first piece, you may choose to pick up other, similar pieces to achieve some efficiencies with what you learned from the first piece. You also consider the size of each piece and compare how long it will take to finish with what remains of the day or of the week. You will try to pick up pieces that make your work schedule efficient.

You also consider what must be done first, what piece precedes what other piece, so that you progress in a natural order through the work. So you circle the pile of sticks, grouping pieces where they give you efficiencies, being careful not to pick up a piece out of order.

The pieces in this pile may be either regular activities for the office or special tasks for the project. The interplay between the two is hard to predict and depends heavily on the nature of the actual work itself. In general, the regular work is more familiar and more predictable (because you have done it before). The project work is less familiar and less predictable (because, by definition, the result is unique, so some of the work must be new). As you walk around the pile you can clearly see the outlines of the regular work while the outlines of the project work remain somewhat obscured.

The Whole Week

What guidelines for balance does the “pick-up-sticks” approach suggest if you are a white-collar professional? Let’s begin with smallest details and begin by *scheduling the whole week*. The seven-day week is large enough to provide a degree of flexibility, yet small enough to be clearly understood. Many time-management methods recommend weekly planning.[3] A week allows for balancing professional and personal commitments, as well as for balancing long-term and short-term professional activities. And most important, a week allows you to balance office activities and project tasks.

Imagine a table with columns headed “Monday,” “Tuesday,” and so on, through “Sunday.” The rows are the hours of the day labeled in thirty-minute increments from 6:00 a.m. to 9:00 p.m. Enter pieces of work on this table. Begin with personal activities, then turn to the project-office mix of work lying in a pile. (See Figure 1.)

Figure 1. Mornings a Week at a Time

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
7						
8						
9						
10						
11						

We are assuming you do not need to schedule time to learn how to do your assignment. Even on projects, the evidence is that people “often” have adequate technical talent to perform the task.[4]

First Things First

What’s next? A skilled worker seeks to achieve a good balance by *doing the most important work first*. When the departmental schedule is most important, you pick up any regular activities that must be completed before a deadline. When the project’s schedule is in jeopardy, you pick up project tasks that lie on the critical path. When two assignments both need your immediate attention, you get help or push out the least important deadline.

When the schedules have been attended to, you do the next most important work. As you arrange the work in declining order of importance, wherever you can, you bundle the pieces of work in the most efficient manner. This may mean bundling project work together, then bundling office work together, or it may mean bundling similar work (both office and project) together.

The way you “pick up” work here is by placing it on your weekly personal calendar. You begin by placing the “big bundles” on the calendar before the “smaller bundles” and finally the individual pieces. You try to arrange your work so that if the big bundles shift you can gracefully rearrange the smaller bundles and individual pieces. You allow for the variation inherent in the estimates of the work, especially the project work.

Reduce Risks Early

A second rule of thumb says *do “risky” assignments early*. When you have a choice, and one assignment has a higher risk factor than another (either in terms of likelihood of problems, impact if there is a problem, or uncertainty about the estimate of how big it is), you should do the risky assignment first. This lets you find out early whether you have a problem or not, when you still have the maximum flexibility to respond to the problem. Do the well-known and “safe” work later to avoid having “last-minute” crises.

“Schedule Driven” Work

A third rule of thumb says *limit “schedule driven” work*. Avoid filling more than 85% of your workweek with “schedule driven” work.[5] That’s 34 hours of “schedule driven” work in a 40-hour week. Scheduling 34 hours of “schedule-driven” work does not mean you will work less than 40 hours, it means you will at least *plan* for six hours of “work that can be delayed.” The six hours may actually be spent on a variety of options: on slips in the “schedule driven” work, on helping others with their work, on unexpected risk events, or on the originally planned “work that can be delayed” itself.

If you plan 40 “schedule-driven” hours, allow yourself 47 hours, following the 85% rule, to complete them. Also, remember that when working more than 50 hours, you will lose efficiency and you should allow for that loss in your planning.[6]

How Big are the Pieces?

While work that comes from the regular job may be familiar, work from the project is probably less so. It's wise to keep the less familiar project tasks under control by keeping them relatively small. A well-formed project task should take the worker *no more than two weeks* to finish. The upper boundary when you are full-time on the project is ten workdays, or 80 hours. Office activities may be allowed slightly larger boundaries because they can be more reliably predicted.

A work assignment has two opposing sets of forces pushing on its size and duration. Pushing to make it larger and longer is the worker's desire for autonomy and the manager's desire to lessen the overhead of reporting. Pushing to make it smaller and shorter is the worker's need to see progress and the manager's need to minimize the impact of a missed deadline. (If the deadline were eight days, you could take corrective action sooner than if the deadline had been fifteen days.) An old rule in software development says never let a task exceed two weeks.[7]

From Hours Per Week to Days Per Month

Our knowledge worker needs to balance work over days of the month as well as the hours of the week. At any one time, a project task can range in size from four to ten days, with complementary job activities filling the schedule. If you are a skilled knowledge worker, how many project tasks can you complete in a month?

In the best case, by skillfully balancing your time between the regular job and the temporary project, you can finish several small project tasks ahead of schedule and manage to log *four* completed milestones during the month. (Remember, at least four days were reserved for your regular job.)

In the worst case, you could fail to complete a single milestone. For example, you have only four days available for project work and a task planned for nine days. If the project work was limited to four staff-days during the month, the project task should have been split into two smaller pieces.

There are a number of ways to break up a task into sub-tasks. When faced with the worst-case schedule, you should take the initiative to break up the work in such a fashion that the project manager can expect *a deliverable within two calendar weeks*.

So in the worst case, after you split the task into pieces, you get one completed milestone in a month. If you started just before the beginning of the month, completed the first task in a little longer than the expected two weeks, you could still be working on the second task when the month runs out.

The result? Our individual worker, by skillfully balancing the regular job and the temporary project, can, in one month, accomplish some regular job activities and *one to four project tasks*.

The Ongoing Work

The new work assignments come to our knowledge worker from the job supervisor or the project manager, from the regular needs of the job or from the posted plan for the project. The assignments often arrive with embedded challenges and attached urgency.

On the regular job, you handle work activities in the routine way. You report your work according to the defined operations of the office. Communications are governed by office policy.

On the project, new work can arrive when a predecessor task is completed, when a co-worker needs a hand, when a change of plan intervenes, or when a risk event occurs. You deliver completed tasks as soon as they are finished and report their delivery in the weekly or biweekly project progress meetings. Communications are governed by the project communications plan.

As a skilled knowledge worker you constantly juggle your plans for the week and for the month. Business value drives each assignment's priority. As special needs arise, you fluidly rearrange the job activities and the project tasks to optimize your delivered business value for the week and for the month. You use the "work that can be delayed" to safeguard the "schedule driven" work and keep things moving according to plan. In short, you successfully balance your regular job and your temporary project.

Balancing Skills

Our knowledge worker can successfully meet the challenge of balancing a regular job and a temporary project by exercising skills that include:

- Obtaining a good estimate of both the size and the schedule of every job's activities and of every project's tasks.
- Intelligently grouping small pieces of work (parts of both regular job activities and project tasks).
- Managing personal and professional hours on a seven-day week.
- Doing the most important work first.
- Doing the risky assignment before the safe assignment.
- Committing to no more than the total real calendar days available in the month.
- Limiting "schedule driven" work to 85% of the calendar and scheduling "work than can be delayed" to the remaining 15%.
- Defining, or re-defining, a project task to finish within a two-week duration.
- Understanding the business goals of both the regular job and the temporary project, and being able to choose between them.

From Multi-Assignment to Multi-Project

Now that we understand how a knowledge worker can balance the demands of a regular job and a temporary project (the problem of multi-assignments), how does our knowledge worker apply these skills to more than one project (the problem of multi-projects)? The answer, it turns out, is simple.

Our white-collar professional can handle at most five assignments, activities or tasks, a month. If each task comes from a different project, our knowledge worker can balance up to five “multi-project” obligations across the four weeks of the month. With reasonably sized tasks, the number will usually be between two and four.

Remember that the month’s assignments should include three days of “work that can be delayed.” Such work can be either job activities or project tasks not on the critical path (and with sufficient slack to avoid affecting the critical path).

So by applying “multi-assignment” balancing skills an individual knowledge worker can solve the “multi-project” problem. The next pressing question is what must the white-collar organization do to allow the individual knowledge worker to exercise these balancing skills?

The Challenge to the Organization

A man is rich in proportion to the number of things which he can afford to let alone.
Henry David Thoreau
Walden

Just Enough Process

We will begin with the minimum requirements needed to help our knowledge worker and expand our list only under duress. Our goal is to understand what are the few, critical, organizational actions necessary to meet the “multi-project management” challenge. Looking at the knowledge worker’s list of skills on the previous page we see that, at a minimum, the organization must:

- Provide good estimates of both the size and the schedule of every job’s activities and of every project’s tasks.
- Avoid committing any person to more than the month’s total calendar days.
- Be sure that work plans limit “schedule driven” work to 85% of the calendar and allow “work that can be delayed” to fill the remaining 15%.
- Encourage skillful individual time management.
- Be sure every assigned project task has a two-week (or less) duration.
- Be sure that everyone understands the business goals of both the regular job and the temporary project(s) in a way that enables them to choose among them.

While the list is obvious, these minimal requirements may provide a real challenge to many organizations. For starters, how does an organization provide good estimates for both job activities and project tasks?

Good Estimates

Regular job activities may not always be easy to estimate, but they should be easier than the unfamiliar tasks of the average project. Project estimating has received a lot of attention over the years and experienced-based ranges of values will do the trick in most circumstances.[8] Range estimates can capture what total-quality experts call “common

cause variation” and will reliably estimate both the individual tasks and the project’s overall size and schedule.[9]

An organization with elementary project planning skills should have no trouble providing our knowledge worker with estimates for the work assignments he or she is being asked to undertake. The functional departments can do the same. Our knowledge worker can use the estimates to fit the work into the days of the month. If the total plan exceeds the days available, the knowledge worker must renegotiate the work.

The Monthly Fit

Organizations that fail to understand their role in supporting good project management usually fail the “monthly fit” test of adequacy. The leading symptom of this failure is that the responsible senior line manager cannot say how many staff-days of project work are budgeted for the up-coming month.[10] A related symptom is that the project and department managers do not know the total work the people on their projects have been asked to do. Another symptom of this problem is that the project managers complain that their projects are understaffed. Such symptoms are all too common.[11]

Sometimes department managers assert that their staff is 100% dedicated to department work, but cannot supply any supporting details. Sometimes the list of department work totals well over 100% to show that no member of the staff can possibly do any additional work. In both cases, the senior line manager must insist on better tracking of time spent. Only when the departmental work is held to the same standards as the project work can rational trade-offs be made.

When even the heads of the individual departments and the managers of the active projects have no idea what their group’s total staff-day budget for the up-coming month is, the first thing the organization must do is:

- Have each department manager submit their budget in staff-days for everyone in the department.
- Have each project manager submit a budget in staff-days for everyone on the project.
- Have both (or all) the parties agree on the number of staff-days for each staff person involved, so that *everyone’s budget is within the calendar month’s available staff-days*.
- Have everyone adjust the plans’ schedules to reflect the monthly agreement.

This agreement among the projects and the departments is the responsibility of the senior line manager overseeing both. The agreement must be reviewed monthly and probably should look ahead two or three months. “Best practice” companies have this meeting at least monthly and sometimes more frequently.[12] Software tools exist to track these agreements in a practical way with a minimum of overhead to either the department heads or the project managers.[13]

At a strategic level, “best practice” organizations practice quarterly (or semi-annual), long-term resource planning, to be sure the multi-year goals of the organization can be

factored into the monthly decisions. Successful project managers know they must be prepared for both the monthly and the quarterly meetings.

Project Managers of Part-time Resources

In order to be effective during the monthly meeting, a project manager needs to have reviewed the project's planned budget for each part-time staff member. The project manager must first know *how much* time will be required of each individual. Only after that question is answered should the project manager explore what the detailed *schedule* will be.

An emerging "best practice" in many companies is to leave working out the details of the schedule to the individual knowledge worker in consultation with the project managers, cooperating fellow workers, and department heads. This can work if everyone's monthly total fits within the month and no one is grossly overworked. Software that supports the individualized scheduling has proven quite successful in practice.[14]

The watchword for successful managers of part-time project resources is "don't level your resources, *budget* your resources." Part-time, white-collar resources frequently have such volatile schedules that traditional resource leveling is a waste of time. It's a waste of time because the resource's constantly shifting schedule requires constant re-leveling. And the new answers are no more lasting than the old answers. A skillful manager will recognize when over-planning is a waste of time and back off.

What can the skillful project manager do to ensure his or her project will get completed in this multi-project environment with part-time resources?

1. Be sure to fight for monthly allocations of the appropriate resources.
2. Adjust the plan's schedule to reflect the result of these resource fights.
3. Be sure everyone knows the business value (priority) of the project (and each assigned task).
4. Be sure that a "schedule driven" task is highlighted to the individual who will be working on it.
5. As you negotiate the work plan with each individual, make sure that the no task exceeds the two-week boundary. (Redefine the work if necessary.)
6. Make sure each of your resources has scheduled at least three days of "work that can be delayed" during the month.

Deciding Who Gets the Critical Resource

Multi-project management grows more complex when a person with a unique skill is needed for two different assignments at the same time. The decision rules are well known, (but difficult to apply):

1. Do the assignment with the bigger business value first.
2. If the assignments are close in business value and one is "schedule-driven," do the "schedule-driven" one first.
3. If both are "schedule-driven" and have the same business value, do the one that has the earliest project deadline (higher risk) first.

When a critical resource becomes a constraint across several projects, the projects should be arranged to provide the most overall business value. When value is synonymous with schedule, well-known methods can be applied to scheduling the critical resource.[15]

These three rules are often violated because the organization has failed to make, or to make widely known, an assessment of the business value of the work. But how, exactly, does the organization arrive at the business value of the work?

Business Value

When a project is undertaken to provide a unique service, the business value is the expected net profit that the project earns by completing the effort. When a project is undertaken to produce a product, the business value of the project is entwined in the fortunes of the product.

A basic understanding of the business value of the products produced by the projects is critical to the organization wrestling with the challenges of “multi-project management.” Business value determines whether the project should be done at all, and whether, after it has been started, it should be continued. Business value determines who gets the organization’s scarce resources first. Business value affects the value of a day of schedule, the value of a product feature, the value of a dollar of cost. Finally, business value allows everyone on the project to make intelligent tradeoffs in their day-to-day work decisions.

The business value of a project is best expressed in two dimensions, profit over time. Not only *how much* profit, but *when it will occur*. Two of the many ways to view such business value are shown here.[16] Figure 2 is a six-year business model of the product that includes the investment (mostly the project cost) and the return (the product’s cumulative profit). Figure 3 graphs the monthly cash flow for the same six-year model.

Every project should have such a business model. (In fact, every project does have a model, but many remain *implicit* because no one has written the model down and made it *explicit*.) If the organization fails to provide an explicit business model to the project, the project team should construct its own and publish it to the organization.

Figure 2. A Business Model of the Value of a Project's Product

	Year					
Gross Economic Benefit (Sales)	-1	0	1	2	3	4
Economic Cost (Expenses)		143	257	463	625	375
Project Cost		105	194	369	530	335
Net Benefit (Profit)	130					
Cumulative Benefit	(130)	38	63	94	95	40
	(130)	(92)	(29)	65	160	200

Exploring Figures 2 and 3

Figures 2 and 3 have several features. First, they insist that the product of the project, the project's deliverable, be considered in terms of economic costs and benefits. The economic gross benefits are often sales, the economic costs are often business expenses plus the one-time project costs, and the economic net benefits are often profits. Second, they show how these forces are expected to play out over time. We can see the full life of the idea (or at least its future for the next six years).

Note that this "economic" cost-benefit analysis can work even in "not for profit" organizations. Coming into compliance with a new regulation, trying to reach a new audience, upgrading to meet a competitive challenge, instituting a new departmental process, or capitalizing on a new discovery, are all projects whose results have economic gross benefits, costs, and net benefits over time.

A third feature of Figures 2 and 3 is that they require advice from the relevant experts in the organization. Relevant experts might include marketing, sales, manufacturing, legal counsel, R&D, development engineering, support engineering, or representatives from a particular user community.

A fourth feature of the two figures is that they allow the project team to illustrate how a marginal change (say, plus or minus 10%) might affect the overall business value. By comparing marginal changes in project schedule, product features, and project cost, the organization can make critical tradeoffs both during the planning and during the execution of the project.[17] These discussions of marginal value necessarily require seeking advice from the relevant experts.

With the business value derived from a business model, our project team can allocate business value down through its work breakdown structure to the individual tasks.[18] After completing its detailed planning, our project team is prepared to manage its resources flexibly, and to defend itself against the onslaughts of other projects.

With a clear concept of each project's business value, the project managers and the department managers have some hope of resolving their monthly negotiations over constrained resources. Schedules must yield to business value.

The individual project business models can be assembled into a strategic portfolio analysis of the organization's many projects (especially new-product projects) and allow the senior management to adjust the projects to reflect the strategic objectives of the corporation.[19]

With the individual knowledge worker balancing the day-to-day work and with the organization engaged in "just enough process" to coordinate multiple projects, the "multi-project management" challenge has been substantially met. What remain are a few considerations about "full-time" work – when the individual is completely dedicated to one project, but the

The Challenges of Full-Time

What of architectural beauty I now see, I know has gradually grown from within outward.
Henry David Thoreau
Walden

Full-time project work has disadvantages as well as advantages. The stability and efficiency of the assignments of a “regular job” are transformed into the higher-risk, volatile tasks of the project. Safeguarding long-term functional expertise is subordinated to supporting the short-term, ad hoc needs of the project. However, organizations often decide, after carefully weighing the alternatives, to launch a full-time project.

Full-time Work for the Individual

By focusing on the needs of the individual knowledge worker, we see clearly that our multi-project solutions for part-time work also apply to full-time work on projects. Full-time project work is simply the management of a series of one to five tasks in a given month. The same intelligent grouping of work details that occurs in the multi-project world occurs when our worker is engaged in a variety of tasks on a single project. The level of contention for an individual’s services may be less and time may be more focused on the work at hand and less on switching contexts between projects. So in general, a skilled worker with a supportive organization will find the full-time environment easier to manage than the multi-project environment.

Full-time Work for the Project

A project manager with a full-time staff is much happier than a manager with a part-time staff. With the competition for staff removed, the project’s schedule and cost become much easier to manage. Dates can be met, costs can be contained, and the product appears as planned.

Full-time Work for the Organization

At the organizational level, the full-time environment usually results in an increased emphasis on project organizations and decreased emphasis on functional departments. The alternative organizational structures are well understood and documented in the literature as “functional, weak matrix, strong matrix, and project.”[20]

Organizational structures strongly influence the role of a “project office,” (or even whether one exists.) Traditionally “project” and “strong matrix” organizations have sponsored project offices to select computer tools, define processes, audit practices, and manage the career development of project managers. Today some “functional” and “weak matrix” organizations have project offices that provide part-time project managers with basic administrative support, such as scheduling or financial reporting. In almost all cases, a project office can offer critical coordination and support for the monthly resource meeting.

Conclusion

By focusing on the individual knowledge worker in a white-collar organization, we have arrived at the individual skills necessary to balance work in a “multi-project” environment. From these individual skills, we have derived a minimum set of business imperatives for an organization that wishes to enable its members to be successful in this environment. In particular, we have derived effective practices for project managers and for line managers. One critical element of these practices is an explicit model of the business value of each project.

As an organization gets better at “multi-project management” it will achieve more business value with less difficulty. “Multi-project management” will mean the same thing to all parties. Everyone will understand that as they move to meet the challenge of “multi-project management,” they can expect to see job satisfaction increase, business productivity rise, strategic focus sharpen, and bottom-line profits increase.

An Afterword: Manager Brown’s January Work

All models are lies. Some models are useful.
George Box

Introduction

To better understand what work planning might look like in detail consider, for the moment, Manager Brown’s January Work. Manager Brown runs a generic department. Like many senior line managers in white-collar companies, he must meet the multi-project challenge. Brown wants to make sure that the regular work of the department gets done. At the same time, Brown has two winter projects going on, Generic Project Apple and Generic Project Pear. His success next year depends on completing both of these projects as soon as possible. His problem is how to coordinate his regular work with the work of his two projects.

(The actual work details in this example have been “abstracted” to provide a generic model that fits many different work situations.)

Brown runs a small department. Working for him are Red, White, Blue, Yellow, Black, and Green. Black and Blue will manage the two winter projects: Black, the Generic Apple Project, and Blue, the Generic Pear Project. It’s late December and Brown is getting ready to sit down with Black and Blue and lay out their January work.

Before the meeting each constructs a list of work. The three lists look like those shown in Figure 1. Let’s explore each of the three lists.

Brown's List

Brown is in charge of the department's regular work. From experience, he knows how long most jobs take by the hour, day, week or month, and he knows who has the skills to do them. He jots down some of those thoughts in his activity description and sketches the number of staff-days that each will require for the month.

Brown supports his estimate with some background numbers. As you look at these figures you are reminded that some activities require considerable, even full-time, work. Other activities are special monthly activities that need to be done at a certain time of year. For these special activities, Brown notes what kind of skill is needed. (Skills are represented here as geometric shapes such as circle, triangle and so on. Each individual worker may possess one or several skills.) As it turns out, every activity that Brown puts on his list for the meeting needs to be completed in January.

Figure 1. Work List of January Days of Work: First Detailed Thoughts

Work Description	Monthly		Work Assignments							Check		
	Stff-day	Budget	Background	Brown	White	Black	Yellow	Blue	Green		Later	
Regular Department Work												
Activity A, an hour a day	2.5	=1*5*4/8		2.50							ok	
Activity B, two hours, twice a day.	10.00	=2*2*5*4/8			10.00						ok	
Activity C, two people, four hours a day	20.00	=2*4*5*4/8				10.00	10.00				ok	
Activity D, two hours, three times a week	15.00	=2*3*5*4/8		7.50	7.50						ok	
Activity E, one person, full time	20.00						20.00				ok	
Special monthly activity F, Circle or Square	6.00	3,5,10		6.00							ok	
Special quarterly activity G, two days this month, Circle	2.00			2.00							ok	
Special one-time activity H, 20 hours, Triangle	2.50	=20/8						2.50			ok	
Special one-time activity I,	5.00	2, 4, 9				5.00					ok	
<i>Total Regular Dept</i>	83.00			18.00	17.50	15.00	10.00	20.00	2.50	0.00	0.00	ok
Generic Project Apple												
Activity AA, an hour a day	2.5	=1*5*4/8				2.50					ok	
Activity AB	2.00	1,2,3				2.00					ok	
Activity AC, Square	8.00	5,8,11				3.00		5.00			ok	
Activity AD, Square	7.00	4,6,11			2.00	2.00				3.00	ok	
Activity AE	7.00	4,6,11								7.00	ok	
Activity AF, Circle	7.00	3,6,12								7.00	ok	
Activity AG, Circle	7.00	3,6,12								7.00	ok	
Activity AH, Circle or Ellipse	6.00	4,5,9								6.00	ok	
Activity AI, Circle or Ellipse	4.00	2,4,6								4.00	ok	
Activity AJ, Circle	8.00	7,8,9								8.00	ok	
<i>Total Generic Project Apple</i>	58.50			0.00	0.00	2.00	9.50	0.00	0.00	5.00	42.00	ok
Generic Project Pear												
Activity PA, an hour a week	2.00	=4*4/8					2.00				ok	
Activity PB, Square	2.00	1,2,3					2.00				ok	
Activity PC, Square or Triangle	7.00	5,7,9					7.00				ok	
Activity PD, Square or Triangle	8.00	7,8,9							8.00		ok	
Activity PE, Triangle	8.00	7,8,9						4.00	4.00		ok	
Activity PF	10.00	4,6,20								10.00	ok	
Activity PG	7.00	3,6,12								7.00	ok	
Activity PH, Circle	8.00	7,8,9								8.00	ok	
Activity PI	8.00	5,8,11								8.00	ok	
Activity PJ	9.00	7,8,12								9.00	ok	
Activity PK, Circle or Square	8.00	7,8,9								8.00	ok	
Activity PL, Circle, Square, or Ellipse	7.00	3,6,12								7.00	ok	
Activity PM, Triangle	8.00	7,8,9								8.00	ok	
Activity PN, Square or Ellipse	8.00	5,8,11								8.00	ok	
Activity PO, Circle or Square, and Triangle	8.00	4,8,12 (4)								8.00	ok	
Activity PP, Triangle	7.00	5,7,9								7.00	ok	
Activity PQ, Triangle	8.00	7,8,9								8.00	ok	
Activity PR, Triangle	9.00	8,9,10								9.00	ok	
Activity PS, Triangle	6.00	3,6,9 (3)								6.00	ok	
Activity PT, Triangle and Square	8.00	4,8,12 (4)								8.00	ok	
Activity PU	5.00	3,5,7								5.00	ok	
Activity PV	7.00	5,7,9								7.00	ok	
Activity PW Circle	9.00	7,8,12								9.00	ok	
Activity PX	8.00	7,8,9								8.00	ok	
Activity PY, Circle, Square and Triangle	6.00	3,6,9 (3)								6.00	ok	
<i>Total Generic Project Pear</i>	181.00			0.00	0.00	0.00	0.00	0.00	15.00	12.00	154.00	ok
<i>Total Monthly Work Assigned</i>	126.50	Staff-days		18.00	17.50	17.00	19.50	20.00	17.50	17.00	196.00	
<i>Remaining Work</i>	196.00	Staff-days										

Brown assigns the department's regular work to himself, Red, White, and Yellow. He goes light on Black and Blue who will be leading the projects, and frees up Green who will be helping on the projects.

Black's List

Black makes a preliminary list of tasks for the Generic Apple Project. She sizes the project tasks by using three-point estimates of the staff-days of work involved. (The formula for a three point estimate with an assumed underlying triangular distribution is, mean = [low + likely + high]/3.)[21] She lists activities in the order she thinks they should be done. She lists the required skills that certain activities require, be it "circle" or "square" ("ellipse" is optional). She assigns Green where she can best use him. As she assigns the work she realizes not all of it will get done in January, so she stops and comes to the meeting prepared to adjust her draft list.

Blue's List

Blue goes through similar thinking as he builds the list for the Generic Pear Project. Several tasks can benefit by lots of help and a few tasks require several people (noted in parentheses). The tasks, like Black's, are estimated in staff-days of work and placed in the order they need to be done. Blue also specifies required skills for certain tasks. He knows that several activities may be performed in parallel, but that even so, his project will continue for several months. He comes to the meeting prepared to be flexible.

Figure 2. Budget of January Days of Work: Summary Version Before the Meeting

Work Description	Monthly Work Assignments										
	Staff-day		Brown	Red	White	Black	Yellow	Blue	Green	Later	Check
Regular Department Work	Budget	Background									
Regular activities (A-E)	67.5		10.00	17.50	10.00	10.00	20.00				ok
Special activities, Circle, Square(o), Triangle	15.50	4 activities								15.50	ok
<i>Total Regular Dept</i>	<i>83.00</i>		10.00	17.50	10.00	10.00	20.00	0.00	0.00	15.50	ok
	Staff-days										
Generic Project Apple	Budget	Background	Brown	Red	White	Black	Yellow	Blue	Green	Later	Check
Activity AA, an hour a day	2.5	Mgt								2.50	ok
Milestone AE, Square	24.00	4 activities								24.00	ok
Milestone AJ, Circle, Ellipse (o)	32.00	5 activities								32.00	ok
<i>Total Generic Project Apple</i>	<i>58.50</i>		0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.50	ok
	Staff-days										
Generic Project Pear	Budget	Background	Brown	Red	White	Black	Yellow	Blue	Green	Later	Check
Activity PA, an hour a week	2.00	Mgt								2.00	ok
Milestone PE, Square, Triangle	25.00	4 activities								25.00	ok
Milestone PJ, Circle	42.00	5 activities								42.00	ok
Milestone PO, Circle, Triangle, Square, Ellipse (o)	39.00	5 activities								39.00	ok
Milestone PT, Triangle, Square	38.00	5 activities								38.00	ok
Milestone PY, Circle, Square, Triangle	35.00	5 activities								35.00	ok
<i>Total Generic Project Pear</i>	<i>181.00</i>		0.00	0.00	0.00	0.00	0.00	0.00	0.00	181.00	ok
	Staff-days										
<i>Total Monthly Work Assigned</i>	<i>67.50</i>	<i>Staff-days</i>	10.00	17.50	10.00	10.00	20.00	0.00	0.00	255.00	
<i>Remaining Work</i>	<i>255.00</i>	<i>Staff-days</i>									

The Monthly Resource Meeting

By the time Brown, Black, and Blue get together they have boiled their lists down to the summary categories in Figure 2. They quickly see that they have more work than they can do in January. With $67.5 + 255 = 322.5$ staff-days of work and 7 workers it is easy to see that the projects will go on for several months. The three make the work assignments for Browns' regular departmental work. They distribute the work so that everyone is under the 20-day limit except for Yellow who is working full-time.

After they complete the regular work, the group turns its attention to Black's project. Black is not only managing the Apple Project; she is its chief worker. (Both Black and Blue possess all the skills needed on their projects.) White and Green have "square" skills and can help a little. Black can expect to have half of Milestone AE done by the end of the month with the rest of the work put off until February.

Blue's project is similar to Black's. With Green's help he manages to complete Milestone PE by the end of the month. Green has both "square" and "triangle" skills.

By the time they are done they have revised their work assignments to look like those in Figure 3. The "Later" column reveals work for the next month. The "ok" is a spreadsheet check to be sure that the assigned work adds up to the monthly budget.

Figure 3. Budget of January Days of Work: Summary Version After the Meeting

Work Description	Monthly		Work Assignments								Check	
	Budget	Staff-day	Background	Brown	Red	White	Black	Yellow	Blue	Green		Later
Regular Department Work												
Regular activities (A-E)	67.5			10.00	17.50	10.00	10.00	20.00				ok
Special activities, Circle, Square(o), Triangle	15.50	4 activities		8.00		5.00			2.50			ok
<i>Total Regular Dept</i>	83.00			18.00	17.50	15.00	10.00	20.00	2.50	0.00	0.00	ok
Generic Project Apple												
Activity AA, an hour a day	2.5	Mgt					2.50					ok
Milestone AE, Square	24.00	4 activities			2.00	7.00			5.00	10.00		ok
Milestone AJ, Circle, Ellipse (o)	32.00	5 activities									32.00	ok
<i>Total Generic Project Apple</i>	58.50			0.00	0.00	2.00	9.50	0.00	0.00	5.00	42.00	ok
Generic Project Pear												
Activity PA, an hour a week	2.00	Mgt							2.00			ok
Milestone PE, Square, Triangle	25.00	4 activities							13.00	12.00		ok
Milestone PJ, Circle	42.00	5 activities									42.00	ok
Milestone PO, Circle, Triangle, Square, Ellipse (o)	39.00	5 activities									39.00	ok
Milestone PT, Triangle, Square	38.00	5 activities									38.00	ok
Milestone PY, Circle, Square, Triangle	35.00	5 activities									35.00	ok
<i>Total Generic Project Pear</i>	181.00			0.00	0.00	0.00	0.00	0.00	15.00	12.00	154.00	ok
<i>Total Monthly Work Assigned</i>	126.50	Staff-days		18.00	17.50	17.00	19.50	20.00	17.50	17.00	196.00	
<i>Remaining Work</i>	196.00	Staff-days										

The High-level Critical Agreement: Monthly Days of Work

Brown, Black, and Blue try to stop when they have reached the point where each individual is in the 17-19 day range (Yellow is a little over). They have reached a critical agreement on the monthly days of work. They have figured out how to work within their resource constraints.

They have also wisely left a little slack in their plan to *increase* their efficiency. They know that the department team works well together and that they need some time to help each other out, rearrange schedules, and deal with the many small emergencies of work life. As a second check on their slack, both Blue and Black will assess their project schedules to be sure that the “schedule-driven” tasks total less than 16 staff-days for their team-members. As a third check, each individual will also examine his or her own personal monthly calendar.

Before they conclude, the three managers sketch out what February, March and April may look like. With a regular three-month projection, planning the current month will become a matter of making the final small revisions to a month that has been looked at four times.

The Detailed Project Scheduling

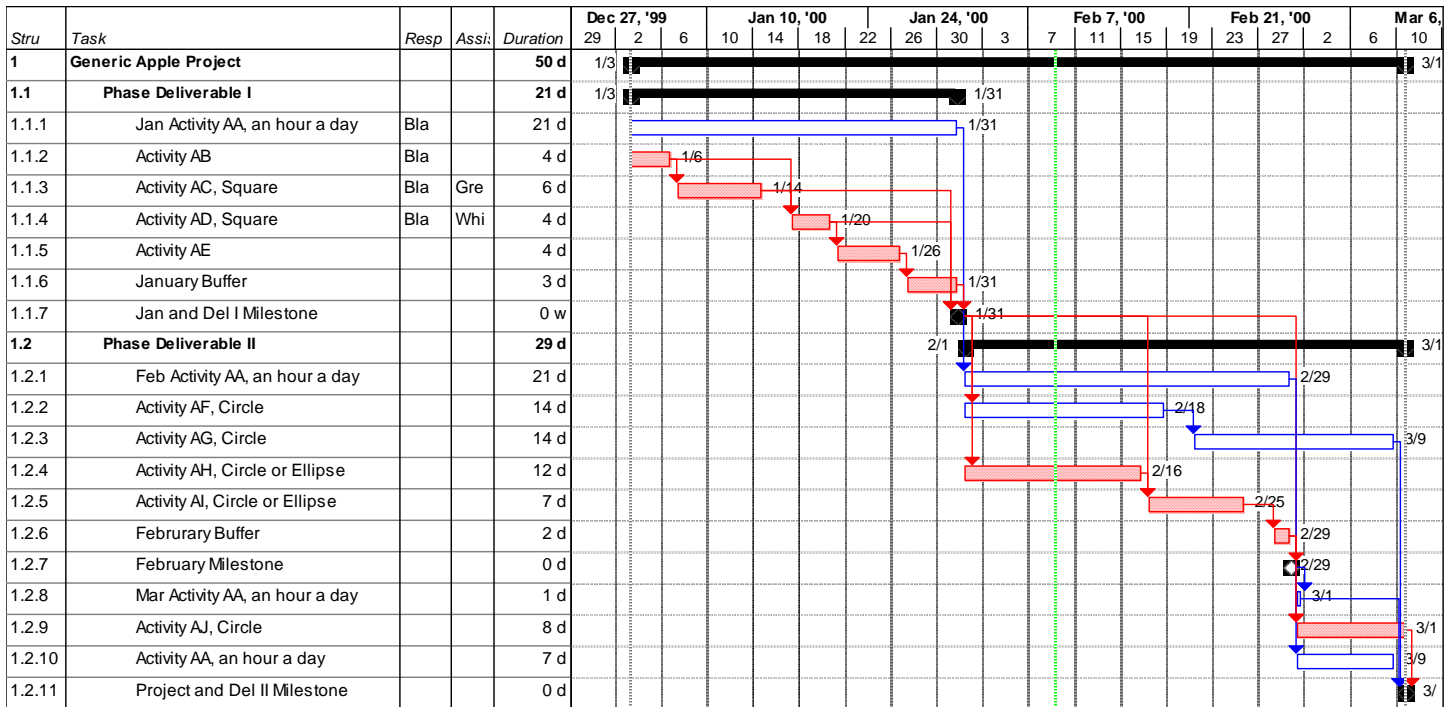
During the January meeting Brown, Black, and Blue have made a number of staffing decisions without fully understanding their detailed scheduling implications. Brown knows how the regular work looks because it changes little from month to month. But after the meeting Black and Blue will set up (or go back and review) their detailed project plans to see how their staffing constraints will affect the projects' completion dates.

Black's Generic Apple Project

Black's project's Work Breakdown Structure, resource assignments, and Gantt chart (with its implied network logic) are shown in Figure 4.

Black has adjusted her schedule to reflect the budget constraints on her January activities. She schedules what she knows is possible within the month and hopes that a little extra can be worked in. She has extended each task's duration to reflect the staffing that it will receive. She has added dependencies to reflect how the work must be ordered and she has added milestones to signal the completion of significant events. She has added a “buffer” task to explicitly manage her schedule “slack.” She reviews what it would take to hire an extra hand to help with the project activities, if they run long

Figure 4. Black's Generic Apple Project



Green can look at the project schedule and see that her work will fall in the early part of the month. Black hopes Green can plan her schedule to meet the project's schedule. The details will be worked out between Black and Green.

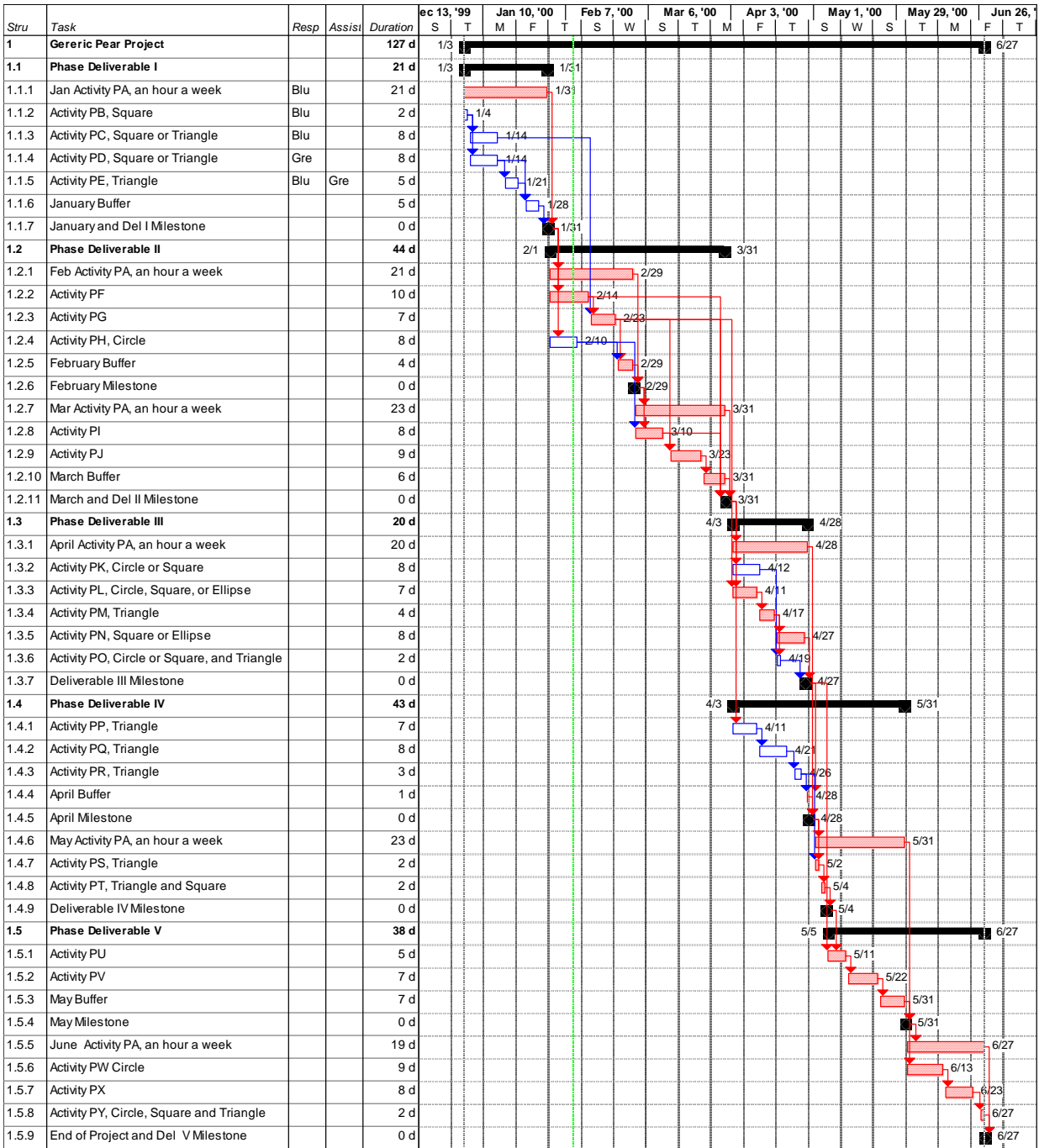
Blue's Generic Pear Project

Blue's project's Work Breakdown Structure, resource assignments, and Gantt chart (with its implied network logic) are shown in Figure 5. He has planned five days of schedule buffer to be sure that he gets the first deliverable completed in January. He has tentatively scheduled his project all the way to its end in June.

Brown's List

Brown lists the special monthly department assignments. The details are familiar to all. He makes a note to talk to White about some concerns about her special assignment. Brown expects the team to understand the regular work and sort out the details among themselves.

Figure 5. Blue's Generic Pear Project



After completing their plans, Black and Blue attach Brown's list of special departmental activities and publish a consolidated list with each individual's work highlighted. Figure 6 combines the monthly regular work with all the project work. Each member of the department gets a copy of this sheet with his or her activities highlighted. In Figure 6, Green's activities are highlighted (underlined).[22]

Figure 6. January Combined Work (With Green's Work Underlined)

Stru	Task/ToDo	Resp	Assist	Date (in ToDo)	Prio	Sta	Notes
1.1.2	Activity PB, Square	Blu		1/4/00			
1.1.2	Activity AB	Bla		1/6/00			
1.1.3	Activity PC, Square or Triangle	Blu		1/14/00			
<u>1.1.4</u>	<u>Activity PD, Square or Triangle</u>	<u>Gre</u>		<u>1/14/00</u>			
<u>1.1.3</u>	<u>Activity AC, Square</u>	<u>Bla</u>	<u>Gre</u>	<u>1/14/00</u>			
1.1.4	Activity AD, Square	Bla	Whi	1/20/00			
<u>1.1.5</u>	<u>Activity PE, Triangle</u>	<u>Blu</u>	<u>Gre</u>	<u>1/21/00</u>			
1.1.5	Activity AE			1/26/00			
1.1.6	January Buffer			1/28/00			
1.1.1	Jan Activity PA, an hour a week	Blu		1/31/00			
1.1.7	January and Del I Milestone			1/31/00			
1.1.1	Activity AA, an hour a day	Bla		1/31/00			
1.1.6	January Buffer			1/31/00			
1.1.7	Milestone Deliverable I			1/31/00			
1	Special monthly activity F, Circle or Square	Bro		1/31/00			
2	Special quarterly activity G, two days this month, Circle	Bro		1/31/00			
3	Special one-time activity H, 20 hours, Triangle	Blu		1/31/00			
4	Special one-time activity I	Whi		1/31/00			

Green's Personal Schedule

Green makes sure that her assignments will fit into her work calendar. She notes that she should focus first on Black's project, then on Blue's. She warns Blue that she will not be able to finish activity PD when it is scheduled and after Blue discusses the schedule with her, they decide that the 5 days of schedule buffer will cover it. Finally, Green notices she is doing schedule-driven work for 17 days. She knows she cannot say yes to any other "schedule-driven" work.

The rest of the team will do what Green has done. They will create their own personal schedules and fit their work to the calendar month with particular attention to the first week. They will line up all the "schedule-driven" work and move the rest of the work around to accommodate the schedule. If anyone has difficulty with a scheduled date, the conflict will be worked out between the person and the appropriate manager or, as a last resort, in a meeting of Brown, Black, and Blue. This personal detailed scheduling works because the management team is **committed to maintaining the budgeted monthly days of work**.

Personal Scheduling

This personal self-scheduling works extremely well in the world of quick changing priorities where limited resources juggle many assignments. By limiting the overall monthly work budget for each member of the department, the three leaders, Brown, Black and Blue, can expect the individuals to work out their own scheduling details to get the work done. This places the fine details of planning where they belong: with the individual doing the work.

The formal scheduling technique known as "resource leveling" becomes worthwhile when priorities are stable, when the number of "full-time project" workers increases,

when a few scarce talents are required on several projects, and when the project's business value exceeds the business value of the departmental work. Only when the "resource leveled" schedule has the expectation of being both valuable and stable is the benefit of resource leveling worth its cost.[23]

Conclusion

For a great number of companies meeting the multi-project management challenge, Manager Brown's January illustrates a practical solution with "just enough" process: The management team budgets the monthly days of work, the project managers schedule their projects within the budgeted constraints, and each team member arranges a personal schedule to get the work done in a timely fashion.

A Final Note on Ongoing Monthly Planning Tools

While Brown worked out the month of January with his small team on a spreadsheet, a larger group would find they would need a mature resource-scheduling tool to continue forging their monthly agreements. (Of the many tools that claim to do this job, few perform adequately in real business settings. ResSolution® may be unique in having a proven track record of several years of successful use in real businesses.)

Imagine that Manager Brown's Department has grown to 20 people. Seven Yellows (with a variety of skills) are all working full-time in the expanded department, while a total of eight Greens (also with a mix of skills) are working mostly on projects. Black and Blue are each managing two projects. The ResSolution® view of the year might look something like that shown in Figure 7.[24]

Before the regular monthly meeting, Black and Blue, review their MS Project 98 Plus project plans for the needed skills, the schedules, and the total amount of work. Brown lists any special departmental activities for the month. At the meeting, ResSolution® makes it possible to search for "triangle" talent to juggle people between projects and, once again, to achieve a budget for the monthly days of work.

After the meeting the individual project plans are revised and collated. Each person gets a list of individual activities and due dates. Everyone assembles a personal calendar for the month and resolves any remaining conflicts.

With a mature resource-scheduling tool, the Brown management team plans out the regular departmental work for the year and the four projects' work in full. The team reserves time for the easily anticipated seasonal work and blocks out time for much-needed vacations. The team filters its list of people to find any combination of required talents. In addition, the team tracks the work to see how the month's days were really spent, so it can improve future planning.

Many companies have found that a mature resource-scheduling tool provides a convenient, practical way to support the critical agreement on monthly days of work. This essential picture of who's working on what assignments has helped some senior managers to achieve for the first time a realistic "monthly fit" of their total resources.

Figure 7. A ResSolution® Screen of Brown's Department for the Year

	Start	End	Total	Brown	Red	White	Black	Blue	YIGrp	GnGrp
Planned Absences										
Reserved Dates			240.0	20.0	20.0	20.0	15.0	15.0	70.0	80.0
Vacations	6/1/2000	9/30/2000	240.0	20.0	20.0	20.0	15.0	15.0	70.0	80.0
Operations			2227.5	128.0	212.0	125.0	120.0	2.5	1640.0	
Regular Departmental Work	1/1/2000	12/31/2000	2212.0	120.0	212.0	120.0	120.0		1640.0	
Special activities	1/1/2000	1/31/2000	15.5	8.0		5.0		2.5		
Projects			1665.5			2.0	51.5	73.0		1539.0
Project Apple	1/1/2000	3/31/2000	51.5			2.0	11.5			38.0
Activity AA	1/1/2000	3/31/2000	7.5				7.5			
Milestone AE	1/1/2000	2/15/2000	12.0			2.0	2.0			8.0
Milestone AJ	2/1/2000	3/31/2000	32.0				2.0			30.0
Project Pear	1/1/2000	6/30/2000	189.0					33.0		156.0
Activity PA	1/1/2000	6/30/2000	12.0					12.0		
Milestone PE	1/1/2000	1/31/2000	25.0					13.0		12.0
Milestone PJ	2/1/2000	3/31/2000	40.0					2.0		38.0
Milestone PD	2/1/2000	4/27/2000	39.0					2.0		37.0
Milestone PT	2/1/2000	5/4/2000	38.0					2.0		36.0
Milestone PY	5/5/2000	6/27/2000	35.0					2.0		33.0
New Project A	3/1/2000	7/31/2000	475.0				20.0			455.0
New Project B	5/1/2000	9/30/2000	325.0					20.0		305.0
New Project C	7/1/2000	11/30/2000	275.0				20.0			255.0
New Project D	8/1/2000	12/31/2000	350.0					20.0		330.0

Notes

1. Of 226 respondents doing project work in eight companies, over 75% spent significant amounts of time on regularly assigned, (non-project) work. Specifically, only 7 (3%) worked exclusively on project work and only 66 (25%) spent more than 80% of their time on project work. Overall, 64.5% of their time was spent on project work and 34.5% on office work. (The numeric averages don't necessarily add to exactly 100%) (See Nevison, February 2000).
2. The figure 20% is a handy place to begin a discussion of splitting time between two assignments that both demand attention. It was suggested by Heinz Scheuring, a veteran of eighteen years of project management consulting. (See Scheuring, 1999).
3. Time management is about balancing the many goals of an individual. It is especially relevant to the particular problem of balancing different work assignments. The most ardent proponents of the week-at-a-time management are Covey, 1989, and Covey, Merrill and Merrill, 1992. Oncken, 1984, and Webber, 1972, have additional valuable insights.
4. In a New Leaf Project Management study, 280 respondents doing project work in eight companies answered that "In our organization, people who work on our current projects have adequate technical skills," a heartening "often." (See Nevison, February 2000).

5. The 85% figure is a rule of thumb that comes from skilled senior project managers. One of my most experienced partners, Carl Belack, uses 85%. (See Belack, 1999). A current client uses 6.5 hours per 8-hour day for scheduled activity. Another client's senior project manager reported in confidence that he scheduled all his projects using a four- (not five-) day workweek. The 85% figure is cited as an upper bound on the "value added work" of development engineers on projects at several clients. (See Smith and Reinertsen, 1998, and Wheelwright and Clark, 1992).
6. A personal study of 30 white-collar professionals suggested the "Rule of Fifty" which says that, "On the average, no matter how many hours a person is at work they only return fifty productive hours." Blue-collar productivity studies of the last 50 years confirm this statistic. (See Nevison, March 1992, and December 1997, and *Winning Project Management* 1998).
7. An early reference to the "two week rule" is in Metzger, 1973. Since then, numerous software clients have confirmed its critical utility.
8. An easy to read introduction to the mechanics of estimating can be found in Durrenberger, March 1999. See also, *Winning Project Management*, 1998.
9. Simple explanations of how add up estimates are in the PMBOK Guide, p. 116. (See Duncan, 1996) and Durrenberger, March 1999. For additional details on advanced scheduling, see Nevison, September 1999.
10. Marvin Patterson, the former Vice President for New Product Development at Hewlett-Packard, says, "Even though it is counterintuitive, booking every resource to the limit usually results in a huge waste of effort. If everyone is always busy on urgent tasks, people are not available when they are needed to resolve a bottleneck, and critical cross-functional talent is not at hand to get the next project started in the right direction." (See Patterson, 1992).
11. When 300 managers across the country were asked for factors causing problems on their projects, the most common answer was "inadequate resources." These managers are not just whining, they are genuinely and chronically understaffed. (See Taylor, 1998.) In a recent New Leaf Project Management study 278 respondents doing project work in ten companies said that only "seldom" was it true that "In our organization we have an adequate number of people to work on our current projects." (See Nevison, February 2000).
12. When asked if his firm allocated resources monthly, a recent client laughed and said, "right now, we are doing it weekly." This may be a little too frequently, but it can occur in a crunch.
13. Over 100 companies use ResResolution is successfully to perform this monthly budgeting. These companies combine the computer tool with monthly resource management meetings among the managers of active projects. (See *Scheuring ResResolution* ® 3.1: *Multi-project Management Resource Tool for Line and Resource Managers, User's Guide*, 1999). For an excellent introduction to the whole subject of computer aided project management see my colleague's summary. (See Belack, 2000).
14. *Scheuring Project 98 Plus*® allows an individual to collect a "to do" list and assignments from one or more Microsoft Project 98 files, to sort the all the tasks in order of their due date, and to print out the list for the month. The individual has the responsibility to contact any project managers whose work may require rescheduling and negotiate an acceptable solution. The individual can practice the pick-up-sticks,

- qualitative arrangement of the work, because his or her quantitative boundaries were set by the organization. (See *Scheuring Project 98 Plus*®, *User's Guide*, 1999).
15. Methods to develop a resource-constrained critical path for the whole portfolio of projects are well known. The methods are all “trial and error” heuristics because no analytical method exists to arrive at the one true answer to this “resource leveling” problem. Some recent approximations have been labeled a “critical chain” and discussed in Newbold, 1998. The helpful concept of DRAG on the critical path is defined and explained in Devaux, 1999. For a simple discussion of the traditional view, see Nevison, 1981.
 16. Many models exist in the literature. Figures 2 and 3 trace their origins to Smith and Reinertsen, 1998, to Patterson, 1993, and to the “return map” of House and Price, 1991.
 17. Recently the author has developed a new diagram to help project teams make the tradeoffs between scope, schedule and cost, called “The 10% Chart.” (See Barker and Nevison, 2000).
 18. Assigning value to the branches and sub-branches of a work breakdown structure all the way down to the level of the work assignments is a useful skill for all project managers. (See Devaux, 1999).
 19. Portfolio management is a familiar idea to those engaged in strategic planning. A sound approach to portfolio fundamentals includes a preliminary allocation of project resources for the next business year. (See Gill, Nelson, and Spring, 1996, and *Scheuring ResSolution* © 3.1: *Multi-project Management Resource Tool for Line and Resource Managers*, *User's Guide*, 1999).
 20. Traditional discussions on the organizational implications of projects are well known. (See Kerzner, 1998, Kezsbom, 1989, and Frame, 1987).
 21. The three-point estimate is based on the triangular distribution from the PMBOK Guide. It was selected instead of the beta distribution because it is an exact formula, and because it is a more conservative estimate. (See p. 116 in Duncan, 1996.)
 22. *Scheuring Project 98 Plus*® allows an individual to collect a “to do” list and assignments from one or more Microsoft Project 98 files, to sort the all the tasks in order of their due date, and to print out the list for the month. The individual has the responsibility to contact any project managers whose work may require rescheduling and negotiate an acceptable solution. The individual can practice the pick-up-sticks, qualitative arrangement of the work, because his or her quantitative boundaries were set by the organization. (See *Scheuring Project 98 Plus*®, *User's Guide*, 1999).
 23. No method exists to arrive at the one true answer to the “resource leveling” problem. Some recent approximations have been labeled a “critical chain” and discussed in Newbold, 1998. For a simple discussion of the traditional view, see Nevison, 1981.
 24. Over 100 companies successfully perform this budgeting through monthly resource-management meetings. (See Scheuring, October 1999).

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About the Author

John M. (Jack) Nevison, PMP is the author of six books and numerous articles on computing and management. During the course of his business career, Nevison has built and sold two businesses, managed projects, managed project managers, and served as both an internal and external consultant to Fortune 100 companies. He is past president of the Mass Bay Chapter of the Project Management Institute (PMI®), a past president of the Greater Boston Chapter of the Association for Computing Machinery (ACM), a certified Project Management Professional (PMP), and a Phi Beta Kappa graduate of Dartmouth College.

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PDU Questions: Multi-Project Management

(6 PDUs for \$59.95)

1. According to the introduction, “Multi-project management” does NOT mean:
 - a. “Competitive products in a strong strategic portfolio”
 - b. “A noisy contentious environment where other projects steal your people”
 - c. “An optimized organization working well together”
 - d. “Internal customers quarrelling about whose need is the most urgent.”

2. The most common form of divided time management is?
 - a. Multi-project
 - b. Multi-assignment
 - c. Split jobs
 - d. None of the above

3. The knowledge worker example in the article must split his or her time between:
 - a. More than one project
 - b. A job and a project
 - c. Multiple jobs and multiple projects
 - d. All of the above

4. Which is a concern when planning the weekly work?
 - a. Most important work
 - b. Most risky work
 - c. Schedule driven work
 - d. All of the above

5. A well-formed project task should take no longer than:
 - a. Two hours
 - b. Two days
 - c. Two weeks
 - d. Two months

6. Which of the following is an individual balancing skill?
 - a. Managing personal and professional hours on a seven-day week
 - b. Doing the most important work first
 - c. Understanding the business goals of both the regular job and the temporary project
 - d. All of the above

7. What is the most schedule-driven work an individual should schedule?
 - a. 70%
 - b. 80%
 - c. 85%
 - d. 90%

8. The organization should strive for:
 - a. Just enough process
 - b. A fully defined process
 - c. A minimal process
 - d. Process for everything

9. To help the individual manage multiple work assignments, the organization should:
 - a. Avoid committing any person to more than a month's total calendar hours
 - b. Be sure every assigned project task has a two-week (or less) duration
 - c. Provide good estimates of both the size and the schedule of every job's activities and of every project's tasks.
 - d. All of the above

10. Good multi-project management results in:
 - a. Job satisfaction increasing
 - b. Business productivity rising
 - c. Strategic focus sharpening
 - d. All of the above

11. Manager Brown's projects include:
 - a. Project Apple
 - b. Project Pear
 - c. Project Orange
 - d. a and b

12. Browns team does *NOT* include?
 - a. Red
 - b. White
 - c. Blue
 - d. Orange

13. Who is in charge of Project Apple?
 - a. Black
 - b. Red
 - c. Blue
 - d. White

14. The managers left a little slack in their plan in order to:
 - a. Decrease their efficiency
 - b. Increase their efficiency
 - c. Not to effect their efficiency
 - d. None of the above

15. Just enough process is illustrated by:
 - a. Management budgets monthly days of work
 - b. Project managers schedule within monthly budgeted constraints
 - c. Team members arrange their personal schedules
 - d. All of the above

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