Using Government Labor More Efficiently
– or –
Making Fractions Count

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Abstract

The inability to reschedule employees quickly in response to changing conditions creates idle employees. Especially within the research arms of the federal government, this idling is particularly expensive due to the relatively unusual and diverse skills of many employees. This paper describes a low-cost solution to optimize staff assignment, lower budgets, and reduce unnecessary staff idle time with an associated reduction in management cost and related overhead.

Background

Change has become an innate characteristic of government. Yet current federal practices are strongly biased against frequent change. For example, at the beginning of the fiscal year, management requests each NIST staff member to agree to a description of their tasks for the entire year. Although many staff are able to do so, a large number of people cannot predict what they are likely to be doing at the end of the week, no less six or twelve months distant. A ritual dance ensues in which both manager and staff knowingly "pencil" in something that sounds acceptable all the while knowing that it will soon be ignored.

In some cases, the reasons are obvious. Unexpected events (new technologies, crises, political whims, etc.) require replanning and employee reassignment. But even expected events can be undermined by funding issues, such as when funding has been requested but has not yet arrived. Congress is certainly another good example of the cause but other agencies create delays as well that are unrelated to the fiscal year. In addition, projects can be stopped mid-year for a variety of reasons. For example, unplanned staff absences can cause related work to stop. Or a higher-priority task may cause staff to be reallocated. Or unexpected difficulties in a subtask may delay subsequent tasks. In fields where the success or schedule of tasks is difficult to predict, unplanned developments are a common occurrence.

The result is that highly-trained employees are often unfunded but continue to be paid a salary. In extreme cases, RIFs are executed[1]. As RIFs are expensive financially and morally, they are generally a last resort. More commonly, highly-trained staff end up doing work far afield from their expertise and interest. In many cases, staff perform work for which they are overquali-

1. "RIF" stands for Reduction In Force but is essentially the same thing as a layoff.

fied and overpaid. Meanwhile, positions for which such staff are qualified go unfilled or are filled by less appropriate staff. So projects slip – both those that are now being executed by underqualified staff and those projects that have had those same staff removed – all because of ignorance over the availability of more appropriate staff.

Staff are also encouraged to apply for funding in areas where funding exists – not because of need or interest. "Because that's where the money is" is a frequent rejoinder to "Remind me why we're doing this?" The result contorts morals, ethics, science, policy and just about every aspect of federal operations. And the result often hurts the very management problems that it was originally intended to help. For example, such hunting can backfire by committing staff time to a project that is, in reality, lower priority, than those whose funding has simply not arrived yet.

Besides these costs – staff idling, inappropriate staffing, project delays – another significant cost is management. Staff reallocation requires management's involvement, at the very least for approval. But management can consume significant time just talking about a proposal. They must find out who has the needed skills, who is available, at what cost, for how long, etc. Sometimes more money is spent at the management level than is required by the actual work. This is frequently the case on small projects that require allocations of a week or less, making simple projects expensive or frustratingly impossible.

Proposal

This paper describes a proposed service that directly addresses the problems described in the background. In particular, we propose a registry similar to a help-wanted and help-offered agency. Unlike traditional agencies, the proposed service would be entirely automated, thereby minimizing labor costs. More importantly, the service would support fractional time allocations. For example, the typical GSA-style vacancy announcement merely notes the need for, say, a GS-12 engineer for a minimum 1-year appointment. The proposed service would list similar openings but in terms of hours, weeks, or months.

In reality, it is possible for departments or even agencies to "loan out" staff on a short-term basis. Within agencies, funds can be transferred within a single business day, making the "borrowing" of staff a reasonable way to make use of scarce and expensive resources. In fact, this type of trading occurs now – but on an infrequent basis due to the lack of knowledge of skilled staff and matching openings. Because the bulk of time management and planning is performed at the lowest administrative grouping, short of asking managers of every group in an agency, there is no way to know if there are any staff that have training in a particular area and time when needed.

The service would be accessed via a web browser allowing use from any personal computer with modest resources. Two types of access would be provided:

- Expertise available
- Expertise wanted

Expertise Available

The "Expertise Available" section of the service would provide descriptions of staff expertise along with available times and schedules.

Expertise would be described both formally and informally – there are benefits to both. For example, formal listings make searching easier. ("Language fluency: C, C++, Java") But informal listings are appropriate for many unique achievements ("Experience at debugging TCP/IP problems in broadband networks")[1]

Time and schedules could be arbitrarily sophisticated. As a simple example, staff may know that they will be available in 1 week for a period of 2 weeks until their next project. Or descriptions could be as complex as "all Thursday afternoons but must work from home" to allow for a telecommuter. It might also be appropriate to list "no availability at present time" for staff who cannot positively commit time but believe there will likely be available time in the future.

Listings may also be anonymous. This addresses several problems. For example, staff may not want to work for a particular manager/group for a variety of reasons. Staff (or management) may not want to publicize their staffing excess. Finally, staff are more likely to be honest and open about their qualifications. For example, someone might be reluctant to put "willing to learn Expect" on their resume. In contrast, saying this anonymously produces no public embarrassment or permanent stain on a reputation while leaving open the possibility of on-the-job-training that might not happen in any other way. Conceivably, staff may even list both public and anonymous listings to take advantage of their reputation as well as the possibility for exploring new opportunities.

Expertise Wanted

The "Expertise Wanted" section of the service would provide descriptions of the expertise desired for tasks along with time expectations. Not surprisingly, this would be the converse of the Expertise Offered section – with similar benefits.

Required expertise would be described both formally and informally – there are benefits to both. For example, formal listings make searching easier. ("Language requirements: C, C++, Java") But informal listings are appropriate for many unique requirements ("Vendor has given up – need wizard at debugging TCP/IP problems in broadband networks")

Time and schedules could be arbitrarily sophisticated. The "Expertise Offered" section described several examples. In addition, management might offer "maxiflex schedule – choose your own hours" or "every Thursday for 10 hours" or "ASAP for as long as it takes". These are the kinds of things which could not possibly appear in federal job postings but would truly be helpful to applicants whether short term or long term.

Comparisons to "Contracting Out"

Contracting positions to outside contractors is a common solution to short-time labor requirements. In some cases, it works very well. Some of the best points about outside contracting are that employees can be selected specifically for a short-term task and then released immedi-

1. Commercial equipment and materials are identified in order to adequately specify certain procedures. In no case does such identification imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.

ately at the end of the task. This is definitely not the case when it comes to full-time federal employees today.

This proposal enables the best of both worlds, providing the advantages of full-time staff with contracted-out staff, albeit using full-time staff as contractors. It is possible that this would also reduce the need to contract out in the traditional sense, thereby avoiding the general problems associated with that practice.

To be brief but at least give a hint of the problems to those unfamiliar with them, the general problems associated with contracting out include:

- Contracting management can supply unqualified staff with little or no penalty.
- Contractors can be pulled off assignments at whim of contracting management.
- Contractors typically have no institutional knowledge or loyalty.

Staff Satisfaction – Unexpected Consequences, Unexpected Benefits

As with anything, this proposal may have unforeseen consequences. For example, staff who now temporarily sit idly (or work at jobs that are very easy for them) may be upset when given a job that is more appropriate to their skills simply because they have to work harder. Of course, it is hard to justify this kind of satisfaction. Nonetheless, this is a valid fear that might make staff resistant to such an idea. Indeed, some organizations have an unwritten policy that some percentage of staff time is for unmanaged research under the presumption that there are certain beneficial outcomes that cannot happen under any kind of traditional management. As with any unwritten rule, this remains a dilemma.

On the other hand, staff may find that working to their potential (via this proposal) to be worth the tradeoff. Certainly, it should reduce a large class of complaints and job dissatisfaction. In addition, it should lessen staff and management obsession over funding issues. These and related reasons are some of the rationales people use to leave federal employment and search for more satisfying employment elsewhere.

Other possible benefits may accrue from the interaction of staff with other staff that they might not otherwise ever meet. Making it easy for staff to spend time in “foreign” territory enables ideas to spread more easily. Staff working outside their usual jurisdiction may spread ideas in both directions. Staff bring new ideas to their temporary employers and they take back new ideas to their old environs. Transporting good ideas can be much more effective when done in person than when done by policy decree as is more typically the case.

Although the bulk of this paper has described the proposal as being of value for technical staff, it is likely that it could apply to any staff or management. As a simple example, managers are regularly faced with new situations. To whom do they turn at such times? Some successfully get help from their superiors. Some cannot. Rather than “asking around”, this proposal provides a way for a manager to get help from someone who has the time and experience to do so.

Another management example occurs whenever the director of an organization needs something done which could be handled by any manager. But how does the director find a manager that has the time? There is no way to do so that is both simple and efficient. But with a registry of available and qualified candidates, this is a solved problem. The director simply

chooses from the list. Clearly, this makes management more efficient at both the top and bottom levels.

Security

Since the proposed registry deals with personal information, security must be addressed. Traditional security devices such as encrypted browser links are sufficient to insure that individuals only have control over their own information.

A secondary concern is that individuals not be able to masquerade as others, intentionally or unintentionally, to prevent harm to someone else's record or reputation. Related to this is the idea that management may be fearful that a perceived natural ability to keep 100% employment of their employees may reflect badly on their funding or management skills.

These problems deserve further study.

Future Ideas

Bidding

Requests for the same resources must be resolved. It is possible that ad hoc decisions may suffice in the proposed environment. However, users may find a more scientific system of use. An analog to traditional hiring practices would include a bidding system so that offers can be made and weighed with better appropriate information for comparison. It would be worth reusing ideas from Internet bidding/auction services. For example, Ebay's proxy bidding agent could automate the bidding cycle and, more important, reduce its length thereby leading to better efficiency [1].

Availability outside the US Civilian Government

As described here, this proposal applies only to the US civilian government. The US civilian government has many attributes that are not shared by other settings, such as the lack of a profit. For this reason, it is possible to avoid certain difficulties that would exist in a more competitive environment. For example, the civilian government should have no problems related to the transfer of technical knowledge by an employee moving through different organizations. In fact, this kind of technology transfer ought to prove helpful. Obviously however, this would be perceived differently if it were to take place across corporations.

Technical/Policy Approach

The project would establish an automated World Wide Web-based service reusing some of the same functionality as job-hunting sites such as monster.com [2]. Anonymous browsing would be permitted. Authentication would be performed on all data additions or modifications. Registration and all day-to-day operations would be automated. The service would be implemented via CGI programs using technology already developed [3][4]. Backend services would be provided by a high-performance database such as Oracle or Sybase [5][6]. We believe that a dedicated web-server, database, and disk space would be necessary in the expectation that usage demands will be high. The registry would be self-maintaining and future costs would be limited to minimal operational expenses such as electricity and hardware support.

To supplement the technical solutions, a number of policies must be developed. This would address security issues mentioned earlier. In addition, policies must be developed for governing other information use as well as guarantees over anonymity (when used), data mining, and archiving.

Cost

We believe the cost of implementing this proposal to be a relatively inexpensive one time cost with minimal financial risk. In contrast, we estimate that even from a week's loss per year of time for half the 3000 staff at NIST is five to ten times that figure. So even if only one tenth of the NIST staff used this service, it would be a financial payoff. Ultimately, we belief this proposal could be extended across a much larger part of the federal government with consequent benefits.

Bottom Line

It is in the government's best interest to employ only the staff needed to perform only the work that it is responsible for. The present system falls far short, having inefficiencies in many areas leading not only to extra costs but directly related morale problems.

The proposed service directly addresses the lack of knowledge by providing a rapid and automated means of communicating such information. The service highlights are as follows:

- staff more likely to be assigned enjoyable work since they can make clearer where their expertise and interests lay
- management can find employable staff directly rather than having to "ask around"
- always up-to-date, no lag time between registering information and it becoming public knowledge
- descriptive – not just "GS-11, computer specialist" but instead "marine biologist but happily fluent in C and learning C++"
- no inherent time granularity – effectively applied to hours as easily as days or months
- avoidance of empire destruction and hoarding of employees for no other purpose than the appearance of mismanagement.
- lowers management costs by avoiding scheduling exercises that are knowingly meaningless

We believe the system proposed could be implemented quickly and at relatively modest cost and would easily pay for itself within a short time.

References

[1] http://www.ebay.com

[2] http://www.monster.com

[3]Libes, D., "Writing CGI Scripts in Tcl", Proceedings of the Fourth Annual Tcl/Tk Workshop '96, Monterey, CA, July 10-13, 1996.

[4]Libes, D., ?Authentication by Email Reception", Proceedings of the Fifth System Administration, Networking, and Security Conference (SANS 96), Washington, DC, May 12-18, 1996.

[5] http://www.oracle.com

[6] http://www.sybase.com