

# Revamping Public Sector IT Procurement to Favor Success and Small Business

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## Table of Contents

Introduction .....	3
Upsourcing .....	3
Size and Success .....	4
Consolidated Procurement .....	4
Partitioned Procurement .....	5
Benefits of Partitioned Procurement .....	7
Wrapup .....	9
About the Author .....	10
About CUEC .....	10
Notices .....	10

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## Introduction

Why does the public sector use an IT procurement approach that has a long history of failure? Presumably the reason is that the public sector has yet to be offered a better solution. Given the high failure rates of IT procurement, you would think that the public sector would be desperately trying anything to improve the situation. Yet we don't see this. So the process continues to be used, failure continues to be the result, and the same big companies that failed to deliver in the past are rewarded with new opportunities for failure in the future.

The standard IT procurement approach used by the public sector is *consolidated procurement*. In the consolidated procurement approach, a large project is bid out to a small number of vendors, often a single, large vendor. I call this model *consolidated procurement* because a large body of work is consolidated into one, or, at most, a small number of vendors.

There are three fundamental problems with consolidated procurement.

1. It has poor success rates, which hurts the public sector.
2. It costs too much, which hurts the taxpayers.
3. It excludes small business, which hurts the economy.

This briefing paper introduces an procurement approach that I call *partitioned procurement*. Partitioned procurement is a new approach specifically for procuring large IT systems (systems of \$5M or more.) In partitioned procurement, a large project is partitioned into small (approximately \$1M) projects.

Partitioned procurement benefits to public sector organizations in a host of ways including:

1. It improves project success rates, which helps the public sector be more effective.
2. It reduces project cost, which benefits the taxpayers.
3. It invites small business, which stimulates the economy.

While this paper is directed at the public sector, many of the issues are relevant to the private sector as well. The private sector has long been able to conceal its failures, but they occur with the same frequency of public sector failures.

## Upsourcing

One of the outcomes of consolidated procurement is what I call *upsourcing*. Upsourcing refers to the practice of bidding all or most of large projects to large consulting organizations. The larger the project, the larger the size of the organization that will likely win the bid.

While there are numerous reasons organizations select large vendors to implement large projects a key reason is simple: only large vendors can afford to respond to large bid requests. As a general rule, it costs at least 1% of the value of the bid to prepare a bid response. That means that for a \$20M project, the cost to respond is at least \$200K. Only the largest vendors can afford to

# Revamping Public Sector IT Procurement

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spend \$200K on the *chance* that they might win the bid. Since only large vendors can afford to play, only large vendors have a chance to win.

## Size and Success

In order to understand the benefits of partitioned procurement, we need to first understand the statistical relationship between project size and project success.

An IT project is generally judged to be successful when it meets three criteria:

- The project is delivered on budget.
- It is delivered on time.
- It delivers the required functionality.

A number of statistical studies<sup>1</sup> have looked at what project characteristics best predict project success. It turns out that the best predictor of project success is *project size*. Size and success are inversely related. The larger the size of the project, the more likely it will fail.

The inverse correlation between project size and success is remarkable. Projects under \$1M have a better than 75% chance of success. That success rate drops to less than 50% once project size reaches \$2M. And by the time project size reaches \$10M, projects have a statistically zero chance of success.

This means that projects under \$1M will most likely be on time, on budget, and will deliver all critical functionality. On the other hand, projects over \$2M will most likely be over budget, late, and/or missing critical functionality.

I emphasize the \$1M boundary. It represents the outer boundary of success assurance. At less than \$1M, the project will probably succeed. At much over \$1M, the project will likely fail.

## Consolidated Procurement

Consolidated procurement, the standard procurement approach used for public sector IT systems, roughly follows these steps:

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<sup>1</sup> For two examples, see *The Impact of Size and Volatility on IT Project Performance* by Chris Sauer, Andrew Gemino, and Blaize Horner Reich, Comms of the ACM Nov 07 and *2009 Chaos Report* published by the Standish Group

# Revamping Public Sector IT Procurement

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1. The public sector organization creates a long laundry list of requirements.
2. The requirements are sent out as an RFP (Request for Proposal).
3. A vendor is chosen.
4. The project is implemented.

These steps are shown in Figure 1.

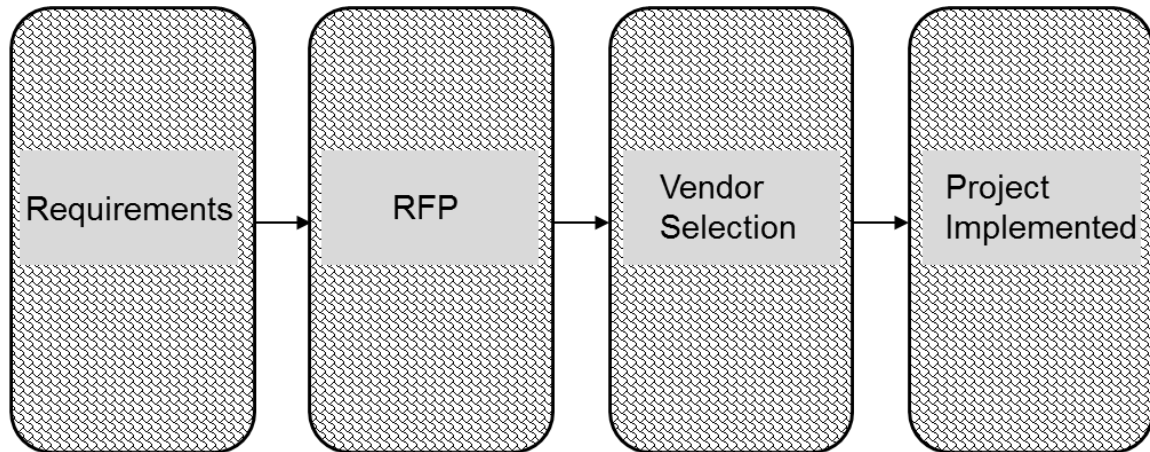


Figure 1. Steps of Consolidated Procurement

In Figure 1, I show the steps of consolidated procurement as oversized boxes. There is a reason for this. Each of these steps is hugely complex. The requirements list, for example, can consist of thousands of items. The RFP can extend for hundreds of pages. The analysis of vendor solutions to large, complex projects is overly cumbersome. The implemented project can include hundreds of thousands of lines of code.

## Partitioned Procurement

Partitioned Procurement follows a different process than standard procurement. In general, partitioned procurement follows these steps:

1. The public sector organization identifies the basic functionality it needs.
2. The functionality is partitioned into a number of subprojects, none exceeding \$1M (the “boundary of success” I discussed earlier).
3. The subprojects are bid out independently.
4. An *integration project* is created as overseer/coordinator of the subprojects.
5. As vendors deliver their subproject, it is added into the integration framework, extensively tested, and, if it passes, accepted.

These steps are shown in Figure 2.

# Revamping Public Sector IT Procurement

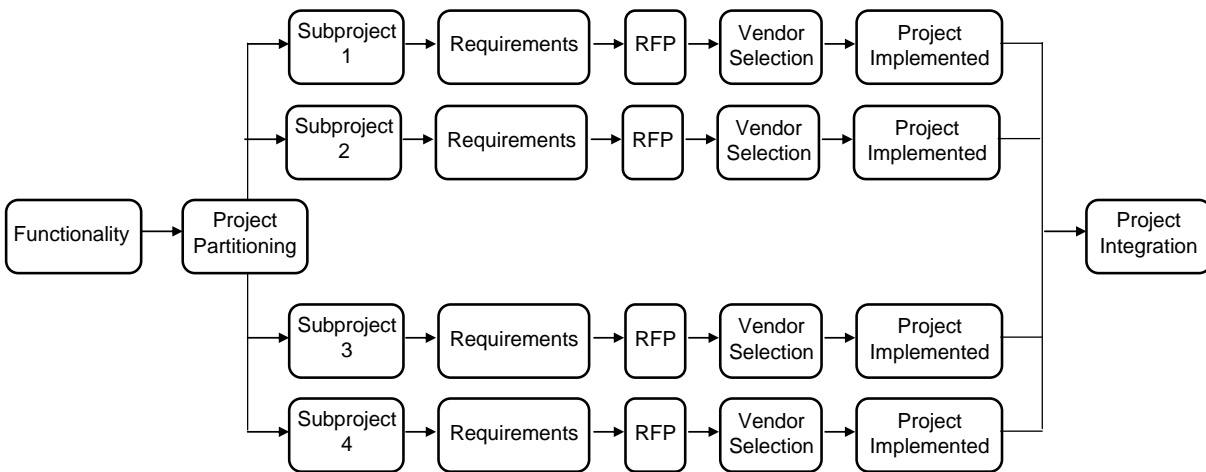


Figure 2. Steps of Partitioned Procurement

If you compare Figures 2 (Partitioned Procurement) with Figure 1 (Consolidated Procurement), you will notice that the former has many more boxes than the latter, but that the boxes are much smaller. This is reflective of the fact that consolidated procurement has many more stages, but that each stage is much smaller and far more manageable and most can be done in parallel with other stages.

There are a number of issues that must be carefully managed for partitioned procurement to work.

First, in the *project partitioning* phase, it is critical that the partitioning result in a collection of subprojects that have as few interdependencies as possible. To ensure this, the partitioning must be guided by a simplification framework<sup>2</sup> such as SIP (Simple Iterative Partitions.) If care is not taken at this step, we end up with a complex collection of small projects that are highly interdependent. This is an extremely difficult situation to manage and the likelihood of failure increases substantially.

Second, in the *project implementation* phase, the partitioning of the technical architecture must closely follow the partitioning identified in the *project partitioning* step. The rules and reasons for this are beyond the scope of this high level position paper, but I have discussed them in depth in my latest book<sup>3</sup> and other white papers<sup>4</sup>.

<sup>2</sup> In this position paper, the terms *complexity* and *simplification framework* are used as defined by the CUEC (Consortium for Untangling Enterprise Complexity) in its standard *CUEC – Standard Definitions of Common Terms* available at [www.cuec.info/standards/CUEC-Std-CommonTerminology-Latest.pdf](http://www.cuec.info/standards/CUEC-Std-CommonTerminology-Latest.pdf).

<sup>3</sup> *Simple Architectures for Complex Enterprises* by Roger Sessions, Microsoft Press.

<sup>4</sup> One such white paper is *The IT Complexity Crisis* by Roger Sessions, available at [http://www.objectwatch.com/white\\_papers.htm#ITComplexity](http://www.objectwatch.com/white_papers.htm#ITComplexity).

## Benefits of Partitioned Procurement

Earlier I said that there are three objectives of partitioned procurement. Now that we have some background, let's consider how each of these objectives is met.

### ***Improving the Success Rate of Public Sector IT Projects***

The first objective of partitioned procurement to improve the success rates of public sector IT projects. This is a critically important goal, because the success rate of large public sector IT projects is very low. As I write this, there is almost \$30 billion dollars of federal funds invested in large IT projects that are considered “at risk” by the Office of Management and Budget<sup>5</sup>. In a recent editorial in Perspectives of the International Association of Software Architects<sup>6</sup>, I estimated that large public sector IT failures are costing the U.S. economy over \$200 billion per year. So there are huge opportunities for a methodology that can decrease the failure rates.

The high cost of IT failure can be largely attributed to consolidated procurement. As discussed earlier, consolidated procurement results in a small number of very large projects. Often these projects are far in excess of \$10 million in size. As I discussed earlier, projects in this size range have a statistically zero chance of success. It should be no surprise, therefore to see \$30 billion of our Federal tax dollars tied up in projects large IT projects that are likely to fail.

Partitioned procurement directly addresses the public sector failure rates by reducing the size of the procured projects. As I discussed earlier, partitioned procurement splits the large project into a number of small (that is, roughly \$1 million) projects. Projects of this size have a 75% chance of success. The difference between consolidated procurement and partitioned procurement is the difference between a single project that has a 0% chance of success and a number of smaller projects that each have a 75% chance of success.

In summary, partitioned procurement improves *success rates* by ensuring that no one project exceeds the \$1M “boundary of success.” Partitioned procurement does not reduce the amount of functionality in the final delivered system. It just breaks that functionality down into manageable, self-contained, autonomous units of work.

### ***Reducing the Cost of Public Sector IT Projects.***

The second objective of partitioned procurement is to reduce the cost of public sector IT projects. We have already seen part of this equation in the reduction of failure rates. By eliminating money spent on IT failures we have an immediate improvement to our return on investment. But partitioned procurement has more to offer in financial incentives.

When we partition a large project into small projects, *the total cost of the small projects is less than the cost of the large project had it not been split*. For example, consider a project that would be bid at \$10 million using consolidated procurement. If we use partitioned procurement we will likely end up with five small projects at \$1 million each and an integration project for another \$1

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<sup>5</sup><http://it.usaspending.gov/?q=content/highpriority-projects>. This figure includes only direct costs for Federal IT projects. It does not include indirect costs or state public sector failures.

<sup>6</sup> This editorial (Obama's Information Technology Priority) is available at [http://www.objectwatch.com/white\\_papers.htm#EditorialIASA](http://www.objectwatch.com/white_papers.htm#EditorialIASA).

# Revamping Public Sector IT Procurement

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million. This yields cost reduction of \$4 million. We have 100% of the functionality delivered at 60% of the cost.

This cost savings may seem counter intuitive. After all, partitioned procurement does not reduce the functionality that is delivered. And it has an upfront cost to doing the functional analysis and the partitioning, a cost that is not borne by consolidated procurement. There is also an additional cost to managing the multiple vendors and the integration framework.

But the *overall* cost is less, not more using partitioned procurement. This is because of the dramatic reduction in project complexity that results from partitioning. It turns out that the largest determinant of overall system cost is not system size but system complexity. Partitioning is the most effective process known for reducing IT complexity<sup>7</sup>.

## ***Nurturing the Local Economy***

The third objective of partitioned procurement is to nurture the local economy. I have already discussed why consolidated procurement leads to the phenomenon I call *upsourcing*, that is, the strong tendency to bid large projects to large vendors.

Partitioned procurement leads to the opposite phenomenon, which I call *downsourcing*. Downsourcing refers to the tendency to bid small projects to small vendors.

There are three reasons why small vendors are more likely to win small projects. First, the cost to respond to the bid is much lower (\$10 thousand, for a \$1 million project) so small vendors can afford to compete. Second, large vendors are less likely to compete, since projects of a million dollars or less are of less interest to them. Third, the small vendors can compete with aggressive pricing since their overhead is lower. The shift from consolidated procurement to partitioned procurement therefore leads to a parallel shift from *upsourcing* to *downsourcing*.

From the perspective of the local economy, *downsourcing* is preferably to *up sourcing*. There are many reasons for this, but three stand out:

1. Small organizations have lower overhead than large organizations, so more of the *downsourced* budget goes into paying worker salaries rather than maintaining corporate bureaucracies.
2. Small organizations include historically underutilized businesses, so *downsourced* projects represent an opportunity to redress past wrongs.
3. Small consulting organizations tend to be local with respect to the tax dollars paying for the project, so *downsourcing* results in greater stimulation of the local economy.

It is true that in consolidated procurement large vendors will subcontract some of their work to small businesses. They do this because they are required to by the terms of the public sector contracts. But the amount of these subcontracts is measured in pennies on the dollar.

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<sup>7</sup> For more on the relationship between complexity and partitioning, see my book *Simple Architectures for Complex Enterprises* published by Microsoft Press.

# Revamping Public Sector IT Procurement

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Small business is local business. With consolidated procurement, the local economy pays all of the bill and gets few of the benefits. With partitioned procurement, the local economy pays a smaller bill and gets all of the benefits.

## Wrapup

Partitioned procurement is a new approach to public sector IT procurement. It shifts the focus from large business to small business. It drives down the cost of procuring IT systems. It improves the quality of the deliverables. It stimulates local economies. But partitioned procurement does face a number of obstacles.

The first obstacle is that partitioned procurement upsets the status quo. Today, public sector procurement is dominated by large businesses. These businesses have an incentive to support consolidated procurement rather than partitioned procurement. In most cases, their profitability *depends* on consolidated procurement. So it is likely that many of these vendors will oppose the shift to the partitioned procurement approach and these vendors have considerable influence on public sector decision makers.

I am hopeful that the more innovative large vendors will see the value of partitioned procurement. By embracing, rather than rejecting this approach, they may be giving up short term profits on large projects but they will be gaining credibility in their ability to deliver. As success becomes the expectation in the public sector, companies that can deliver success will have a great competitive advantage over those that can't.

The second obstacle is training. Very few procurement specialists have the training to do partitioned procurement, especially the early phase of project partitioning, shown in Figure 2. This is the phase in which the larger project is partitioned into smaller projects, This phase requires a good understanding of the science of project partitioning, the relationships between the business functions, and collaborative leadership skills.

The third obstacle is that partitioned procurement is still new. Many organizations are uneasy trying an approach until it has been widely used by others. *Ironically, many organizations feel more comfortable using a "standard" approach that is proven to work poorly rather than a try a new approach that would almost certainly work better.*

Each of these obstacles is real and must be overcome.

The lack of training can best be overcome with education. Procurement specialists must be trained in the theory of partitioning. This involves some training in the mathematics of partitioning and the science of assigning business functions to sub projects. Fortunately, this training is not arduous and an experienced procurement specialist could learn these skills with a week or two of training and a project or two of mentoring.

# Revamping Public Sector IT Procurement

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The fact that partitioned procurement is still unproven can best be overcome with well controlled cost and quality studies led by people who understand the concepts, believe in the promise, and willing to submit the results for independent validation.

Public sector IT procurement is broken. It is time to fix it. The government *needs* a better approach. Tax payers *deserve* a better approach. The economy is *starving* for a better approach. And today, we have the knowledge to *deliver* a better approach.

## About the Author

Roger Sessions is the CTO of ObjectWatch and specializes in managing the complexity of large IT systems. He consults with public and private sector organizations throughout the world. He is the author of seven books and many white papers and has spoken in more than thirty countries on IT complexity. He is recognized as a Fellow by the International Association of Software Architects and a Founding Member of the Consortium for Untangling Enterprise Complexity. He holds multiple IT and enterprise architectural patents. His most recent book is *Simple Architectures for Complex Enterprises*. To be added to his email list, go to <http://www.objectwatch.com/newsletter.htm#subscribe>. Follow him on twitter: @RSessions. Email: roger; domain: objectwatch.com.

## About CUEC

The CUEC is the Consortium for Untangling Enterprise Complexity. The purpose of this new consortium is twofold:

1. discuss and investigate different approaches to making enterprises simpler, and
2. describe how such efforts drive business value.

Our basic premise: enterprise complexity is hugely costly and anything we can do to simplify enterprise systems and processes will pay off in reduced cost and improved efficiencies.

For more information about the CUEC, see the CUEC web site at [www.cuec.info](http://www.cuec.info).

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