A Blueprint for Effective and Adaptable School District Procurement

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About this Report

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ABOUT THE CENTER ON REINVENTING PUBLIC EDUCATION

Through research and policy analysis, CRPE seeks ways to make public education more effective, especially for America's disadvantaged students. We help redesign governance, oversight, and dynamic education delivery systems to make it possible for great educators to do their best work with students and to create a wide range of high-quality public school options for families.

Our work emphasizes evidence over posture and confronts hard truths. We search outside the traditional boundaries of public education to find pragmatic, equitable, and promising approaches to address the complex challenges facing public education. Our goal is to create new possibilities for the parents, educators, and public officials who strive to improve America's schools.

CRPE is a nonpartisan, self-sustaining organization affiliated with the University of Washington Bothell. Our work is funded through private philanthropic dollars, federal grants, and contracts.

Introduction

In public education, procurement reform has been all but ignored in policy discussions. But the high price of ignoring it is becoming clear to people trying to reform education on the ground. District procurement, which often involves long, cumbersome processes and risk-averse central office cultures, can impede school-level decision-making and effective partnerships with entrepreneurs. In New York City and other large urban districts, this environment has stymied efforts to give schools more autonomy and adopt new technology-based solutions.

If a New York City principal wants to buy technology that costs more than $25,000 for her school (a high discretionary threshold by urban district standards), she must first make a request to the district, which then passes the request to the central procurement office, which creates a Request for Proposals (RFP) for vendors. Vendors then must submit responses to the RFP, which get passed among operations officials before being sent to other Department of Education (DOE) departments and analysts. Finally, after circulating to three or four departments, a contract is signed and sent to the check-processing department, which will eventually pay the vendor. This process often takes months or even years—a timeline that is all but impossible for both cash-strapped startup firms and for teachers and students waiting for new products or services.

For decades, public education procurement systems have remained virtually untouched. But emerging technological solutions and the need for school redesign demand that school systems bring procurement practices into the 21st century. As they currently exist, overwhelmingly complex procurement policies and long wait periods before securing a contract dissuade some small startup firms with little capital reserve from working with large urban districts. Frequently, obstacles to innovation stem not from written policies, but from risk-averse central office cultures and imagined constraints.

Such problems are not unique to education. Over the past ten years, government agencies across the globe—in the military, health care, and other fields—have needed to adopt new technologies quickly and embrace a more nimble approach to procurement. They've successfully partnered with private providers, and have shortened the amount of time it takes to execute a contract. These examples are relevant to school districts that seek to create agile, adaptable, and innovation-friendly procurement systems

Here, we review lessons learned about how to create innovation-friendly government procurement systems.

In the first section of the report, we outline the problems urban school system leaders face in procuring innovative goods and services and make the case for reform. We report on findings from a series of interviews we conducted with education leaders in six large urban school systems. We find that urban school systems hoping to purchase the most promising new learning products or to work with leading entrepreneurs to redesign schools or solve learning challenges must first attend to badly outdated purchasing systems, processes, and internal cultures.

In the second section, we distill promising approaches used by other sectors to modernize public procurement processes, particularly around emerging technologies. The lessons described are drawn from a review of journal articles and reports on public procurement reform efforts in the U.S. and other developed countries.

We find that innovative public agencies:
- Create agile, high-capacity systems.
- Commit to streamlined processes and close collaboration with firms.
- Cultivate new markets.
- Support contracting partners and monitor outcomes.

In the third and final section, we discuss how school districts can apply lessons from other sectors to their own reform efforts. Urban school districts that are serious about wanting their schools to solve pressing problems must restructure their internal systems to welcome cutting-edge technology. This is a broad organizational challenge. Procurement must be thought of as a complex set of related policies and systems that cannot be reformed by simply eliminating a few steps in the process. We outline several steps districts can take to get started.

WHY SCHOOL DISTRICT PROCUREMENT NEEDS REFORM

To assess how procurement policies impede urban school system innovation and reform, we conducted semi-structured interviews with central office personnel and observers in six large urban districts: Philadelphia, Cleveland, Los Angeles, Washington, D.C., New Orleans, and Chicago.

Our findings suggest that outdated procurement policies coupled with the risk-averse cultures and habits of central office staff present real barriers to school change and improvement efforts. This results in significant costs and wasted time as schools struggle to get what they need and central offices shuffle proposals and requests between departments.

DEATH BY A THOUSAND CUTS

Those we interviewed described a long series or system of small barriers that added up to a maddeningly slow and frustrating process for information technology (IT) officers or others trying to secure an innovative product or vendor. When asked whether there were any bottlenecks in a recent large technology purchase, one official said, "There were so many, I'm not sure where to start."

One former department head said the central office at her urban district was so "mired and filled with bureaucrats" that she would need to hire employees expressly to "sell the work" to staff in the procurement and other offices. She described procurement as having "… just so much unspoken code and lawyers and bidders conferences and process… there is a ton of back and forth, a lot of it is just total nonsense."

Officials commonly complained about how much staff time gets consumed in the process. Most procurement processes require that all applicants get equal treatment in the bidding stage and that staff do full reviews and ratings of all submitted proposals. This makes it very difficult to weed out firms early on and creates a hugely resource-intensive and costly endeavor. One IT officer described the burden of a recent RFP process: "There were 10 people to review 87 proposals. Each proposal was 110 to 180 pages long and people were reading these in addition to their other jobs. It's a lot of reading and work."

Until recently, one city required all final bidders to reapply and go through the entire process again, creating an onerous and unnecessary workload for district staff and firms.

In addition to overly time-consuming processes, school systems frequently face a central office that is understaffed and has limited expertise, creating a "double whammy" for innovative and nimble purchasing. "There are three people doing procurement for 100 schools—those numbers are incredibly inferior to businesses out there," said one chief financial officer. In some cases, IT officers say they don't have the technical expertise they need to purchase effectively.

ONEROUS BARRIERS TO ENTRY, ESPECIALLY FOR SMALL OR NEW COMPANIES

The typical procurement process for urban districts makes it difficult to partner with vendors other than large, established companies. Those we interviewed reported highly detailed RFPs requiring 100-plus page proposals and burdensome insurance requirements (e.g., checks for tax compliance and background checks). This process is costly for all companies and confounding to those new to the process or without large legal teams. As one IT officer told us:

It's definitely a lot harder for small startups to revise proposals, navigate the procurement process, etc. Big companies eat the cost, but smaller ones can't. The sheer

amount of legal conditions and terms—startups just find it way too complicated. The requirements for minority business enterprise and women business enterprise are also difficult for some small firms.

Typically, the procurement process is designed to favor firms with a strong track record. This, too, makes it difficult to bring in young firms that don't yet have robust evidence of performance. One IT director told us this is why he struggles to contract with companies using programs on mobile devices. A former central office official from the District of Columbia Public Schools (DCPS) described how the procurement rules served to undermine creative partnerships:

What killed me in D.C. was that I had partners (Verizon, Microsoft, etc.) who would come and say, 'I have this cool new product and we think it's good but we'd like to refine it. We'll donate to a school and refine it there.' But there were too many challenges: the district couldn't easily sole source it, so we'd have to put out an RFP, which would take forever. Then, because you'd piloted it in schools before, the original vendor could get excluded from the contract because they would have an unfair advantage. I'd often have to say to them, 'it's just not worth it.'

OUTDATED LOCAL AND STATE REGULATORY ENVIRONMENT

We heard many examples of how urban district technology procurement and use policies clash with an innovation mentality. Two district officials mentioned physical data storage policies that made it difficult to buy cloud-based technologies. Another district struggled to find ways to try to meet legal requirements for protecting students in online environments, such as Twitter, and wound up simply forbidding the use of such websites.

But not all barriers are at the district level. District officials told us the problems often start with state laws that set requirements for when and how districts must conduct competitive bidding. District leaders also argue that state funding constraints make it hard to reallocate funds to pay for new technology purchases, especially during periods of decreased or insecure education funding. In Philadelphia, the district suffered a triple hit, seeing federal money from an Enhancing Education Through Technology grant dry up just as district money and state funding fell, making it very difficult to pay for technology infrastructure.

A PERVASIVE CULTURE OF "CAN'T"

Although many obstacles to innovative procurement are real, some of the internal barriers encountered by central office and school staff are imagined. Those we interviewed argued that districts make it too difficult for people to differentiate between the real and imagined. Both buyers

and inexperienced vendors are frequently unclear on procurement nuances. This tends to slow things down and scare people off from even trying something innovative. As one procurement officer told us, "Schools often don't know the process for buying things and the office isn't great about helping to clarify it. It can be murky and hard to get to."

Over time, scandals and lawsuits have created public pressure for transparent procurement processes that appear fair to all suppliers and the public. Although reformed processes have created obstacles to blatant corruption, they have also resulted in overly cautious lawyers, highly risk-averse central office cultures, and increasingly constrained and lengthy purchasing environments.

One district official reported that the head of procurement says to his new hires, "Assume every vendor is a criminal." Such a culture leads to paralysis through fear, district leaders report. Even in the case of small contracts for which the district does not require an RFP, vendors frequently find it difficult to get approval from the district. One district representative told us, "Each department invokes its own quiet 'no,' but channels all other 'no's' as well. Legal will tell you, 'this has to pass security muster with the IT guys.' IT will tell you, 'Procurement will never go for this.' "

Determined leaders or top-down directives can help overcome this "culture of can't," but as one district representative said, "As soon as the boss isn't pushing on the throttle, anyone can hit the brakes." Without explicit direction, risk-averse actors tend to reinforce each other. Even when there is an openness to change, practice is built on habit. And the creation of new habits requires constant practice and reinforcement.

Some central offices have become so beaten down by processes, constraints, and an overly prudent culture that leaders expressed a palpable sense of passivity and defeat. One chief financial officer said to us, "We've got the suppliers we've got at this point."

RESISTANCE TO SCHOOL-LEVEL PURCHASING

IT and procurement officers often said that school principals don't have enough sophistication and knowledge to make wise purchasing decisions. Most large districts give schools some discretion (commonly $10,000–$25,000) to make purchases, but are resistant to giving schools more purchasing authority. One district officer said, "Our schools have a lot of discretion—probably too much at times." An officer felt that vendors market their products as the tool to "solve every child's problem" and that a lack of research-based performance data lead principals to "chase the new thing," rather than develop systemic, well-considered solutions.

Nominal discretion doesn't always translate into actual purchasing freedom. For example, in New York City, schools generally have to jump through even more hoops to go outside mainstream purchasing channels and then spend time managing details of the contracting and payment processes on their own. No administrative or training processes exist to help schools exercise their discretion with greater ease or competence.

A common disagreement we heard in districts was over the value of centralized, bulk purchasing. Central office technology and procurement officers argued that bulk purchases are essential for cost savings. Others argued that allowing schools to choose and take ownership over their purchases is critical to successfully implementing new technologies and fostering innovative habits. Although most districts allow schools at least some degree of choice by providing principals with a list of pre-qualified products or vendors, the lists are sometimes short and tend to favor large, experienced vendors. But according to some district personnel, it is not unusual for prices to be significantly higher on school purchasing portals than what a smart consumer would pay at retail. And the products available, especially computer hardware, tend to be at least one generation behind current models, further decreasing the price/performance value.

LACK OF EFFECTIVE EVIDENCE GATHERING

In the existing procurement model, research on products that have entered the system is done "after the fact" in the form of evaluations and with data from periodic assessments. This stage of research informs future procurement but mainly in terms of usage, essentially ignoring product quality and learning outcomes. One official said, "We renew the contract if we see it's being used... what we don't have is a way to rate items."

Very few districts we spoke with are doing much to evaluate the performance of various purchases or to incorporate performance incentives. None are using rigorous research and development processes or conducting in-depth return on investment analyses that include student outcomes. Instead, most districts oversimplify the idea of cost, putting a premium on large-scale purchasing power rather than recognizing that sometimes short-term cost savings come at a price. Schools can't purchase what they need for their unique student populations without having developed the ability to be smart technology consumers. And if schools are not invested in the tools available, they are unlikely to use them.

PROMISING APPROACHES TO PROCUREMENT REFORM

Government agencies and entrepreneurs are in many ways diametrically opposed in their willingness to tolerate risk, their proclivity and ability to adapt, and their access to private capital and entrepreneurial thinking. But as

TABLE 1. HOW ENTREPRENEUR ASSETS COMPLEMENT GOVERNMENT DEFICITS

Governments define problems but are structurally unsuited to attracting and sustaining innovation	Entrepreneurs seek opportunities but may not be aware of the social issues that need the most attention
Risk averse	Risk takers
Favor status quo	Innovative problem solvers
Shrinking budgets	Fundraisers
Believe current costs are zero	Believe current costs are high

the use of technology becomes increasingly necessary to keep up with global expectations, governments must look to entrepreneurs to develop contemporary products and systems. In the end, these differences in attitude and capacity can actually become complementary. We illustrate how traits of the two sectors balance each other in Table 1.

Many government agencies have grappled with the same challenges raised in our interviews of district leaders. But we can point to many examples of public agencies in the U.S. and abroad that have successfully employed "innovation procurement." How have they accomplished it? What do leading scholars believe are the most effective approaches? Here, we summarize these lessons.

A FUNDAMENTAL SHIFT

The literature on innovative public procurement consistently shows that success does not come through new regulations or policies, but rather through a cultural shift. This shift moves from a compliance-focused, by-the-book process to an iterative one involving extensive communication and even co-production between firms, agencies, and end users.

This shift requires school district central offices and other public agencies to think less simplistically about cost savings via scale. Public systems built to accommodate today's rapid technological changes take a long-term perspective by extending notions of cost and benefit beyond initial purchase and grounding them instead in end-user outcomes. Some innovations will undoubtedly end in failure. But in a system of iterative design, ongoing assessment, and continuous improvement, new products will likely emerge to meet users' needs in a way that is unlikely under a regulation-driven procurement process.

Although redesigning purchasing systems to meet modern needs is not a linear process, scholars find early action and planning have a deep impact later.[1] Therefore, for any given product, school districts might assess their actions against these areas: 1) preparing agencies for innovation; 2) committing to ongoing innovation; 3) cultivating new markets; and 4) supporting and monitoring innovative firms.[2]

Preparing agencies for innovation:
- Foster agile, high-capacity systems.
- Increase government contractors' capacity and authority.

To create structures that accommodate today's technological change, government must shift norms and processes to foster a culture of agility. This accommodates the entry and exit of organizations including firms, universities, research institutions, and financing bodies. Fast-growing national economies provide examples of dynamic structures and infrastructures built to accommodate change. Instead of attempting to promote innovation through specific long-term purchases or policies, scholars find that systems of innovation create a framework that invites adaptability and exploitation of new opportunities.[3]

> *Creation, destruction, and change of organizations were very important in the development strategies of the successful Asian economies and they are crucial in the ongoing transformation of central and eastern Europe. Hence, organizational changes seem to be particularly important in situations of rapid structural change, which, in turn, is linked to building the capacity to deal with changes.*[4]

Rather than thick policies and regulations (real or imagined) governing all decisions, modern procurement systems can respond quickly to both new technological developments and end-consumer needs.

In effective systems, agencies identify and communicate a need and vision for change to all players in procurement-related activities. A clear message from top officials about how they expect systems and cultures to change makes the vision for organizational, cultural, and procurement-specific changes clear, thereby aligning goals and expectations across the agency. This directive helps bring legitimacy to new processes and norms. The mandate should help all department teams understand and agree on clear decision-making criteria and flexibility, minimizing conflict about responsibilities across departments.

> *Those responsible for the procurement should have a clear mandate from the leadership to create legitimacy and acceptance in all other actor groups. This eases the interaction of all actors involved. While the final*

decision maker does not have to be involved in the procurement team directly, he or she should signal his / her commitment very openly and directly in the kick-off phase of the process.[5]

A mandate's importance in bringing legitimacy to culture change should not be underestimated. Nine case studies of public procurement in the European Union found a clear mandate for change was a common factor in all successful reforms. A separate case study of the adoption of high-quality catheters in United Kingdom hospitals corroborated this finding, concluding that widespread understanding that management stood behind decisions assisted in adoption and diffusion.[6]

As it stands now, most barriers (both internal policies and external laws and structures) go unquestioned by decision makers and procurement officers in the interest of avoiding controversy.[7] The incentives under which government agencies operate help explain why. In general, government employees are not held accountable for the impact of their purchases (or lack thereof). But they can get into trouble for breaking rules or for having a hand in a decision that triggers political backlash.

This incentive structure promotes overly prudent decision-making and sets up disincentives to innovate what one procurement scholar calls "the fear of discretion."[8] Top officials should communicate the need for procurement officers to stop being passive arbiters of policy and start becoming experts in their field, channeling that expertise to make better decisions.

> *The basic principle...should be to increase dramatically the freedom we give public officials to use their judgment in the procurement process. . . . In short, we must somehow free ourselves of our fear of discretion or, more particularly, we must give up those techniques for limiting discretion that produce dysfunctional results.*[9]

To overcome status quo thinking without creating undue risk, government agencies should increase public officials' autonomy and accountability. Autonomy grants an individual (or small group) the authority to make final decisions without review from other departments. Accountability means public officials are held responsible for purchase outcomes and costs. Increasing authority and accountability for cost and impact may help those in the acquisition process re-conceptualize their notion of a "job well done" from blind compliance to expert, discretionary decisions that they believe will maximize impact and minimize cost.

To make high-quality decisions, those in procurement must be experts in market analysis, contracting, and supplier management. They need not understand the technical nuances of all goods and services, but should readily capitalize on the technical knowledge of others.

An innovation-oriented government needs to be able to do three things well: (1) develop a business strategy (specify requirements for what will be bought, choose an appropriate contract arrangement and incentives), (2) select the right suppliers, and (3) administer the contract once signed. These skills are different from those required to produce computers, schools, or job training oneself.[10]

Therefore, districts should expand individual and organizational knowledge and competence through formal and informal learning. Formal learning commonly comes in the form of organized training. But informal learning that comes from experience and communication is critical, too.[11]

Vendors often have more technical knowledge than the procurement officers to whom they sell their products. To bridge that knowledge gap, school districts should appoint strong, visionary information technology officers with a clear understanding of product options and capabilities, and substantial authority in the procurement process. The innovation IT officer ensures that technology assets, operations, and services align across the system and with agency objectives. These technology officers offer a deep understanding of both user needs and supplier offerings and should have the skills to optimize solutions, given multiple and sometimes conflicting demands. Such a strategy proved effective in combatting asymmetric information in France's defense industry (see Box 1).

BOX 1. USING TECHNICAL EXPERTS TO IMPROVE MARKET TRANSPARENCY

In France, asymmetric information between the government and defense contractors (providers had more technical knowledge than government agencies) allowed providers to inflate costs. To overcome this, the government recruited people with strong technical knowledge in engineering and took measures to keep those employees in the same position for many years, enabling them to develop knowledge and relationships. This allowed them to effectively negotiate and identify likely cost overruns before the contract was signed. With technical experts bringing transparency to the process, agencies were able to feel more confident in their negotiations and build risks into contract terms.[13]

Equally critical is the need to involve legal experts to help identify internal or external barriers to innovation, as well find ways to break down those barriers. Procurement law often offers more flexibility than procurement officers imagine and perceive; mythical statutes commonly deter procurement officers from departing from the status quo. Involving legal experts can help procurement teams identify true legal constraints that serve a purpose and must be respected.[14]

Committing to ongoing innovation:

- Speed acquisition processes by streamlining unnecessary steps.
- Create a long-term commitment and process for collaborating with firms.
- Consider how procurement will work in decentralized systems.

Streamlining acquisition requires agencies to potentially reconsider the process a firm undergoes to become an approved vendor. Many complex public procurement systems require vendors to navigate a series of "checkpoints," often with long waiting periods between submissions. Reducing the number of checkpoints but increasing the rigor at each point may dramatically shorten the time required to become an approved vendor without compromising the review process.

Agencies may also streamline the acquisition process by grouping potential contracts by complexity and required processing time. In this system, short-, medium-, and long-term procurement needs are processed separately, allowing procurement departments to respond to immediate needs quickly. A corollary is tiered-approval authority, in which more experienced or competent individuals specialize in authorizing larger, more complex purchases.

Adopting more iterative acquisition structures in which short cycles of action, analysis, and reflection drive decisions also simplifies the process. Building iterative systems from the outset may prevent long periods of technological stagnation in schools or other government systems, making procurement agencies more adept at handling fast-moving changes in technology and understanding needs.[15] By using iterative systems, public agencies can quickly respond to implementation challenges and technological advancements without having to launch a new procurement cycle.

Government agencies should invest heavily in early assessment of markets and costs before making a long-term commitment. This can help avoid costly purchasing mistakes that result from incomplete information and emergency budgeting due to poor cost analysis. Despite higher upfront costs, investing in assessment can help avoid unforeseen price spikes, reducing total costs over a project's lifetime.[16] Even in iterative acquisition, agencies should set long-term parameters around cost to which all parties agree.

Consulting with firms while analyzing markets and writing specifications can help school districts develop realistic expectations and predict future market developments, enabling them to stay ahead of the curve and acquire cutting-edge technology. Early collaboration pays off by enabling public agencies to write specifications for what is coming around the corner, rather than what is already on the shelf. The British military took such an approach in the 1990s (see Box 2).

BOX 2. BUILDING TEAMS WITH DIVERSE EXPERTISE

In the late 1990s, the rate of on-the-market technological change matched the British military's acquisition decision-making timetable, making it all but impossible to incorporate new technologies in real time. Involving the private sector with procurement teams early (during specifications writing) helped develop a better understanding of technological developments underway and enabled the procurement teams to write specifications that were tightly aligned to the most advanced products available. The military also included "qualified military and civilian experts from a wide range of backgrounds covering many core competencies" in the procurement process, building teams with diverse perspectives and areas of expertise. To ensure that all parties understood the procurement process, the military provided training to those from other fields.

The British military also shifted financial resources earlier in the acquisition processes, allocating up to 15 percent of a product's budget to early cost assessment. To streamline approval, they limited the number of "checkpoints" to just two crucial steps along the way: the initial gateway point and the investment point. (Although fewer in number, these approval points were more rigorous.) If risk is underexplored at the investment point, projects are more likely to be sent back for modification or cancelled. Britain's military procurement reform also granted higher-ranking officials more authority to approve acquisition of higher-cost goods and services than their lower-ranking counterparts. In the new system the appropriate officer is incentivized to act quickly—a default approval comes within 48 hours of a program's delivery on business days.[17]

Although quality public procurement officers are expert in market research and product assessment, it is critical that all stakeholders—including procurement teams and firms—remain involved throughout the acquisition and implementation process. This is particularly vital in the context of fast-changing technology, when frequent and open communication between the vendor, agency, and end user are needed to ensure products meet real needs and can be refined over time.[18] Systems of innovation must maintain a dynamic mindset in which all parties expect changes over time. Using its Bloomberg Mayors Challenge award, the city of Philadelphia is fostering close collaboration between the mayor's office and entrepreneurs from around the world to help solve Philadelphia's most pressing problems (see Box 3).

A decentralized purchasing system can facilitate communication between vendors and end users, but public procurement scholars have not reached consensus on whether centralized or decentralized systems are "better" for effective procurement. A report by the Organisation for Economic Co-operation and Development (OECD) analyzing centralized public procurement in Europe outlines advantages for each approach:[20]

Given these trade-offs, school districts should determine an appropriate mix of centralized and decentralized procurement strategies based on their needs and capacities. It may be tempting to try to realize cost savings and benefits that come with centralized procurement. And some degree of centralization is likely necessary to ensure that systems are compatible or that, when necessary, they meet some universal needs (e.g., Common Core implementation). But the need for flexibility, procurer discretion, and dynamic systems in fast-paced contexts often favors a more decentralized structure. Decentralization may also help match product options with a wide variety of end-users' needs and openness to adopt new products. To determine what products and services should be purchased centrally, agencies might establish a decision rule about those that

> ## BOX 3. FOSTERING CITY-ENTREPRENEUR PARTNERSHIPS
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> The Philadelphia Social Enterprise Partnership brings social entrepreneurs together with city government and other partners to research, develop, and apply innovative solutions to urban challenges. Philadelphia has sought proposals from entrepreneurs and brought them to the city to develop and pilot their ideas through a social enterprise accelerator program called FastFWD. In its first year, entrepreneurs have developed products targeting a range of problems, such as substance abuse, recidivism, and youth/gang violence.[19]

meet common needs. Goods and services that are context-dependent should be purchased by individuals who understand the nuanced environments in which they will be used. Such a decision rule should be revisited frequently and modified as appropriate.

Cultivating new markets:
- Specify user needs.
- Develop the supply pool.
- Adopt rapid prototype procurement and contracting strategies with untested products.

With clear organizational goals and capacities in place, effective government agencies work to fully understand end-user needs before purchasing products or services on their behalf. Equally important, effective procurement teams assess end-users' ability and willingness to apply new solutions: this is critical to developing tools that will be successfully adopted in practice. (See Box 4 on the next page for factors that trigger successful innovation adoption.)

Decentralized Purchasing System	Centralized Purchasing System
Incentives for corruption are reduced.	Goods and services are significantly less expensive when purchased in bulk.
Goods and services can closely match end-user needs.	Lower costs may allow agencies to buy higher-quality goods and services.
The effects of bad purchasing decisions, both in cost and outcomes, are contained.	As a large customer, agencies have more negotiating power.
Less complex systems lead to less bureaucracy and shorter wait times in the procurement process.	Agencies can better provide supports (IT, technical training, etc.) when all end users rely on the same set of goods and services.
Small- and medium-sized firms are better able to compete for contracts.	There is greater capacity to manage contracts and resolve disputes.
Local purchasers may be able to obtain lower prices from local firms.	Training costs are lower because staff are fewer and centrally located.
Employees may take more ownership over the procurement process and develop a "service" mentality.	It is easier to evaluate and track staff performance.
	Transparent recording and reporting are more likely and there is a clearer audit trail.

BOX 4. FIVE FACTORS FOR PREDICTING AN INNOVATION'S DIFFUSION AND SCALABILITY[21]

1. **Relative advantage:** the degree to which the innovation is perceived as better than the item it supersedes.

2. **Compatibility:** the degree to which the innovation is perceived as consistent with existing values, past experiences, and needs of potential adopters.

3. **Complexity:** the degree to which the innovation is perceived as difficult to understand and use.

4. **Triability:** the degree to which testing can happen on a small scale before deciding whether or not to adopt the innovation.

5. **Observability:** the degree to which the adoption's results are visible to others.

Districts should keep in mind that user needs and readiness to implement will vary greatly, making it unlikely that one product will be right for everyone. If acquisition teams do not consider the diversity of end user needs and readiness to implement, they risk buying expensive goods and services that go unused or under-used.

Identifying end-user needs and readiness to use new technology should occur early in the procurement process so procurement staff can specify consumer needs in detail. Specifications are a key piece of public procurement and should be clear and comprehensive, whether those specifications are functional or technical.[22] IT staff—who can contribute in-depth knowledge of product options and end-user needs—play a critical role in writing specifications.

As we heard in our district leader interviews, many government agencies procure from a relatively short list of approved providers who tend to be established market giants with the savvy, patience, and large-scale projected benefits that make the procurement maze endurable. Procurement and technology officers should view as an integral part of their job active expansion of the supplier pool to include firms that offer value in multiple ways. Although large, established companies may still provide advantages (such as customer support), small companies tend to be better able to quickly respond to end-user needs. Agencies in fast-changing industries may use short-term and iterative contracts to 'test drive' products from companies that hold promise, but lack a long track record.[23] But school districts

and other government agencies may need to provide small companies that are new to the sector with training and supports for navigating the procurement process.

When end-user needs are clear but product options are not available to meet those needs, agencies should consider sponsoring design competitions or "hackathons." In such a competition, the sponsoring agency typically releases a set of standards around their expectations for product characteristics and uses award money and the opportunity to contract with the agency to incentivize entrepreneur participation. New York City's iZone has hosted several hackathon-style challenges that invite program developers to compete to create the best solutions for New York City's most pressing education problems (see Box 5).

Competitions that incentivize private firms to engage with public problems have the potential to quickly shed light on pressing social problems and galvanize the technology sector to work toward solving them. But one venture capitalist warned the industry to keep the benefits of new technologies in perspective: "Innovation isn't just about technology and design, it's also about the business model."[26] Bringing new technology into an old system with an old way of thinking is unlikely to create systemic change. The main benefit of a hackathon may not be primarily a means to discover new technologies, but a medium through which the system learns new ways of thinking.

When end-user needs are unclear or products do not yet exist to fill a given need, government agencies should consider 'rapid prototyping' to match needs and technologies. This strategy provides products that are not fully developed to a group of end-consumers and incorporates user feedback into a product's final development. The prototype mindset is especially suited

BOX 5. USING "HACKATHONS" TO INVEST INNOVATORS IN SOCIAL PROBLEMS

In 2013 the New York City iZone hosted the "Gap App" challenge, which invited program developers to compete to create solutions for differentiating middle school math instruction. The Department of Education awarded winners with $50,000 in prizes, $54,000 in Amazon web service credits, and opportunities to pilot products in iZone schools. On the heels of the Gap App Challenge's success, the iZone and Spotify co-sponsored the "Music Education Hack," a similar event to develop new music education technologies.[24]

to rapidly evolving technological environments.[26] The U.S. military has used rapid prototyping extensively to quickly develop new tools for warfare.

> *During the Rapid Prototyping process, people in the field can provide real-world feedback, which we can use to quickly modify and upgrade the solution in response to actual new threats. This is an efficient, adaptable, and interactive lifecycle that accomplishes major goals of the mission.[27]*

By pushing back costly and labor-intensive implementation processes until after a design is finalized, rapid prototyping saves time and money in the development phase. In a case study comparing customized design through rapid prototyping and off-the-shelf wearable computers, a team of researchers from Carnegie Mellon University found that procuring new technologies off the shelf "required 10 times the overhead, 30 percent more cost, 50 times the storage resources, 20 percent more effort, 5 times more power, but 30 percent less effort to adapt software to new systems, than the rapid prototyping approach."[28]

Evolutionary acquisition, which accounts for new technological developments or product iterations over time by sourcing products in short increments, may be a particularly good alternative for acquiring developing technologies. In principle, this approach offers the best way to get advanced technologies quickly into end-users' hands while providing the flexibility to improve the technologies' capability over time.[29] Incremental acquisition offers another option, breaking long-term projects into shorter-term contracts, allowing new companies to complete one phase of work before moving forward.[30]

But these contracting tools also have a downside: they depend on strong internal and external communication and sometimes come with unpredictable costs. Managing expectations throughout the process by effectively communicating the vision and preparing stakeholders for unpredictable changes is critical.[31] The U.S. Air Force, for example, found evolutionary acquisition challenging to carry out in a system that favors predictable costs and timelines.[32] To navigate the tension between increased flexibility and uncertain costs, school districts should work with firms up front to set long-term cost expectations.

Supporting and monitoring innovative contracting partners:
- Create integrated management teams.
- Allocate, mitigate, and manage risk.
- Monitor and evaluate implementation and outcomes throughout the process.

Almost all successful public procurement systems profiled in this paper employ integrated project teams. In England's military procurement reform, integrated project teams played a critical role. In France, including individuals with strong

technical knowledge in defense contract negotiations helped ease problems with information asymmetry. In the United Kingdom's health care sector, rapid review panels facilitated adoption of higher quality catheters. Multiple-member evaluation panels can guard against oversights and promote rational decisions by requiring individuals from diverse backgrounds to explain their actions and beliefs.[33]

But because acquisition teams can easily become too large and unwieldy, they should limit themselves to a relatively small number of individuals, all of whom are highly competent in their diverse fields.[34]

Multiple actors and interests can quickly become entangled and communication can break down easily if no one takes responsibility for managing procurement of a given product. Appointing an individual responsible for overseeing the full acquisition process (from market analysis through implementation and evaluation) may be critical to maintaining open communication and coherence throughout the process.[35]

Why have public procurement processes become so extensively bureaucratic? Risk and uncertainty are two main factors. Both buyers and sellers have an interest in minimizing risk, but especially when buying new technology, neither party can eradicate risk entirely. Whether a product will be technically successful and adopted in practice is a valid initial concern. But stakeholders must also consider market risk, which involves public demand and competition.[36]

Technical experts' involvement in procurement can minimize risk by ensuring the public agency has as much technical knowledge as private firms. Market analysis, technical expertise, and open communication with firms in the market can help identify likely future cost overruns and obstacles in development and implementation. If agencies are aware of potential future difficulties from the get-go, they can anticipate this risk in the contract.[36]

Government agencies should also manage risk by actively monitoring communication streams and vendor relationships. These practices are commonly known as supplier relationship management (SRM).[37] Training those involved in procurement on SRM strategies—such as open discussion between suppliers and buyers on how to minimize overall cost without reducing firms' profit margins—may be key in successfully managing supplier relationships.[38]

To ensure products meet end-consumer needs, agencies must monitor and evaluate acquired products during piloting, diffusion, and implementation. Contracts should be transparent about milestones and contract penalties, but specific circumstances may demand procurement teams get creative about evaluation techniques. When procuring new lighting systems for public buildings in Hamburg, Germany, the contract was ultimately divided into many smaller

contracts. To reduce the evaluation burden on staff, the procurement agency evaluated a random sample instead of every single contract.[39]

Using performance-based versus compliance-based contracts helps ensure the system is outcomes-driven. Performance-based contracting specifies outcomes standards that a given product or service must meet and gives providers autonomy over the process. This method can be powerful, but has failed in the past during implementation (one prime example is the U.S. Department of Defense).[40] Some performance-based contracting reforms have specified process-based metrics or limited vendors' autonomy, rendering the "performance-based" moniker meaningless. For example, saying that a vendor must communicate with teachers who use their application at least three times per month is a process-oriented specification. In contrast, calling for at least 70 percent of students and 70 percent of teachers to respond on surveys that an application is a valuable learning tool is a performance-based specification.

Procurers can use outcomes-based performance evaluations for making informed decisions about contract renewal. A government agency could engage in contracts with several different firms with the understanding that the firms would compete with each other for work during the contracting period. As the agency evaluates work over the contract life, it gives more business to top-performing firms. It could do this by 1) shifting business from lower-performing to higher-performing firms, 2) extending the length of higher-performing firms' contracts, or 3) extending the scope of the high-performing firms' responsibility beyond the original terms.[41]

Agencies should also evaluate how new procurement policies affect long-term outcomes in the aggregate. As with all reforms, system change is unlikely without significant attention to long-term implementation. For example, the U.S. Department of Defense initiated 63 acquisition reforms in the 1990s. Although this tremendous reform push appears to have made an impact on the department culture, by 2003 evidence of lasting structural change was difficult to find.[42]

Implications for School Systems

School districts that are serious about wanting their schools to solve 21st-century problems can learn much from procurement reforms in other sectors. Large urban districts with the most complex procurement systems may be most ripe for reform. The most important lesson: Retooling systems to welcome innovative technologies means more than simply instituting isolated policy changes or deleting a few steps on the procurement checklist. Using procurement to support innovation requires a fundamental shift in mindset and culture, offering a whole new way for school districts to conceive of public-private partnerships, school-level decision-making, strategic purchasing, research and development, and risk management.

Below are steps districts can take to get started on the path to meaningful procurement reform.

- **Explicitly create a culture in which employees expect a collaborative and iterative procurement process that relies on professional judgment.**

There must be tight collaboration between users, decision makers, and suppliers and all stakeholders must see procurement as a high communication process. Central offices should re-examine and clarify for employees and potential partners what real purchasing policies are so imagined restrictions can be swept away. And organizational goals and norms must shift from prudent compliance to high-quality discretionary choices that optimize short- and long-term outcomes.

- **Cultivate new markets by identifying end-user needs, developing a supply pool, and adopting strategies for short-term or iterative contracting.**

District procurement teams should include individuals with a variety of expertise, including market analysis, technical knowledge about the products and end-user needs, and familiarity with legal systems related to procurement.

Teams can also benefit from the expertise of firms with a strong sense of emerging products and markets. Creating collaborative procurement teams that oversee the entire process from market research through use may help keep the focus on impact versus compliance.

- **Improve efficiencies by creating more streamlined procurement systems and using contracts that require firms to regularly assess and respond to end-user needs.**

School districts can take a variety of approaches to streamline contracting, including limiting the number of checkpoints through which potential suppliers must pass and divvying up procurement processes by product complexity and cost. Districts can engage in many short-term contracts to test drive a wide variety of products before selecting a few firms with whom to collaborate on a longer-term basis. Alternatively, districts may engage in iterative acquisition, which rolls out products in stages and responds to end-user feedback. Response to end-user needs and constant improvement should be built into any contract. Such strategies help ensure purchases are impactful in practice and create realistic contracting timelines for small firms with useful products but limited financial reserves.

- **Support and monitor contracting partners by planning for evaluation from the get-go, evaluating the impact of both new purchases and new purchasing policies.**

Finally, districts should vigilantly monitor, evaluate, and respond to contract compliance with a focus on outcomes. Too often, evaluation is an afterthought and districts evaluate for compliance alone. Contracts and new products should be evaluated on how well they fulfill the initial need (specified in RFPs or other documents early in the procurement process). School districts should broadly monitor the impact of new procurement policies and adjust them when necessary to avoid unintended consequences. School systems should also clearly communicate new procurement policies: too often, government agencies painstakingly craft policies only for them to be ignored.

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