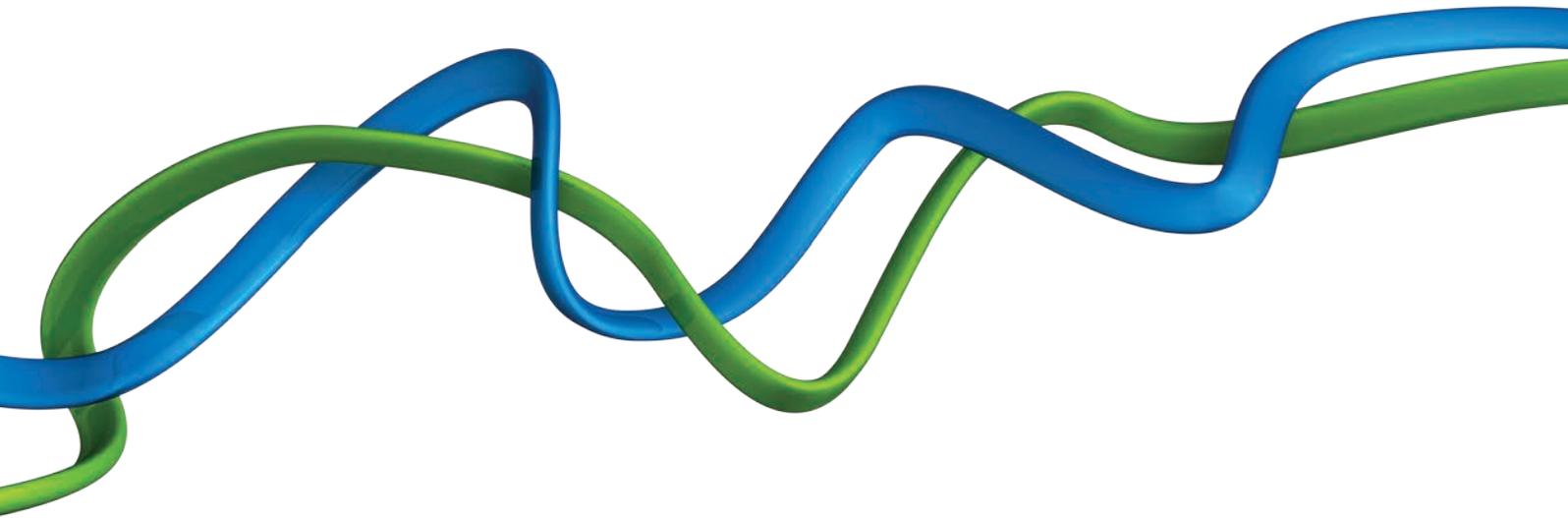




Public projects and procurement in the UK

sharing experience and changing practice



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Contents

1. Introduction and aims of project	2	5.1.2 Changing procurement practice in ICT: the solutions	20
2. The elements of good procurement practice	4	- Systems architect	20
2.1 Leadership and vision	4	- Agile contracts	20
2.2 A systems approach	5	- 'Fail early'	20
2.3 Specification and planning	5	5.2 Procurement in infrastructure and construction	22
2.4 Intelligent clients	6	5.2.1 Changing procurement practice in infrastructure and construction: the challenges	22
2.5 Incentivising the right behaviour	6	- Intelligent clients	22
2.6 Supporting innovation	7	- The procurement environment	23
2.7 Managing risk	7	- Whole-life costing	23
3. Impacts of good procurement: innovation and growth	9	5.2.2 Changing procurement practice in infrastructure and construction: the solutions	25
3.1 Procurement as a stimulus for innovation	9	- Leadership from large contractors	25
3.1.1 Innovation in the tendering process	9	- Sharing skills and enabling communication	25
3.1.2 Procuring innovative products	10	- Making best practice common practice	25
3.1.3 Evolutionary versus revolutionary innovation	11	- Tools and technologies that can help CompeteFor: outreach to SMEs	26
3.1.4 Identifying, accepting and managing risk in innovation	12	6. Conclusions and recommendations about how to change the practice	28
3.2 Procurement for growth	13	7. List of participants	30
4. Reforming public procurement: the changes made by UK government	15		
4.1 Cabinet Office Efficiency and Reform Group	15		
4.2 Commissioning Academy: creating expertise in government	16		
4.3 Public procurement pipelines	16		
4.4 Involving SMEs	17		
5. From principles to practice: ICT and infrastructure	18		
5.1 Procurement in ICT	18		
5.1.1 Changing procurement practice in ICT: the challenges	18		
- The move from monolithic to dispersed contracts	18		
- Apportioning risks	19		
- Budget allocation	19		

1. Introduction and aims of project

This report presents the findings of a series of meetings held at the Royal Academy of Engineering which set out to explore how taking an engineering approach¹ could help the UK government meet its tactical, operational and strategic objectives for procurement. These workshops created a conversation between government and industry to share perspectives and to identify areas where mutually beneficial progress could be made.

The aims of the workshops were to:

- improve understanding between the engineering profession and government on approaches to procurement
- connect expertise in industry with needs in government
- share best practice and principles
- identify ways to foster best practice.

The meetings were carried out in the context of significant changes being undertaken by government to improve procurement processes. Two key drivers for government are how to achieve procurements that deliver the required outputs to the agreed cost and timescale, and how to use annual national procurement budget of around £235 billion to provide wider strategic benefit to the UK. The publication of this report coincides with the publication of *Using Two Stage Open Book and Supply Chain Collaboration*, a piece of research for the Cabinet Office led by Kings College London, and work being done on the Infrastructure Procurement Routemap by HM Treasury's Infrastructure UK.² These government reports set out the improved principles and processes that are to guide public procurement.

¹ By engineering approach we refer to having a systems view of the task at hand; in this context it means situating the procurement of individual contracts within the greater whole or project in which those contracts must function.

² *Using Two Stage Open Book and Supply Chain Collaboration*, King's College London (January 2014) available here: www.gov.uk/government/publications/two-stage-open-book. Infrastructure UK work to be published.

IT AIMS TO IDENTIFY KEY, PRACTICAL ISSUES THAT CAN BE ADDRESSED TO MAKE AN IMPORTANT POSITIVE DIFFERENCE IN PROCUREMENT PRACTICE

This publication discusses some key factors affecting the implementation of these principles in practice and the changes in approach needed across the whole of a major project in order to carry out procurement optimally. It aims to identify key, practical issues that can be addressed to make an important positive difference in procurement practice.

It also highlights the importance of taking a systems view of projects and of treating procurement from this holistic perspective. This was a key theme through the workshops on procurement practice which focused on IT and infrastructure procurement.

A further key theme is how the engineering profession could support government in developing the procurement skills of its staff and by providing an independent source of expertise on how to devise and deliver an effective procurement strategy by:

- supporting government in refining and updating its procurement principles, by providing expert views on the procurement process
- helping to lead on the practical implementation of the right principles and incentivising behaviour change by providing case studies of successful (and less successful) projects
- providing a systems level view through the experience of experts who can be involved in government reviews of procurement activities.

The purpose of this document is to collate key recommendations from two workshops on good procurement practice. It is intended to provide a useful engineering perspective on how to improve public procurement practice, assisting civil servants on the decisions they take and providing potential industry suppliers with an understanding of the culture of public procurement and some of the key issues which inform it.

2. The elements of good procurement practice

Throughout all of the workshops held for this study, seven key features were prominent as being essential aspects of successful procurement practice:

2.1 Leadership and vision

A clear vision of the purpose of the procurement project along with effective leadership are critical.

Strong leadership brings with it a sense of responsibility for the project which should be shared with all suppliers and stakeholders involved. Leadership can also underpin continuity of priorities. In the public sector, procurement can suffer by priorities changing. For example, when senior civil servants, ministers or governments change, values such as sustainability quickly becoming replaced by others, such as cost reduction.

“Cost, carbon, innovation and skills”

the priorities of Peter Hansford FREng, Chief Construction Advisor

The clarity of vision and drive that a good project leader brings to procurement help in setting a well-defined project specification and delivery dates that will guide the course of the project. Consistent leadership will examine the strategic choices made in procurement and measure them against the overall public gain. Conversely, inconsistency in the vision and priorities associated with a project can cause delays and failures. If it is unclear whether budget or deadlines rule in a project, the result can be that neither is met.

Long-term leadership and a clear, concise vision are essential in any major project.

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2.2 A systems approach

The Royal Academy of Engineering report, *Creating systems that work*³, identifies six principles for an integrated system:

1. Debate, define, revise and pursue the purpose
2. Think holistically
3. Follow a disciplined procedure
4. Be creative
5. Take account of the people
6. Manage the project and the relationships

The key strengths of a systems approach are that it takes a holistic view of the project and identifies the interactions and interdependencies of individual elements of the project. This allows the identification of critical interfaces – whether physical interfaces like regional boundaries in a rail system or supplier interfaces between two ICT systems – and assists in identifying early the ways that they could fail.

A systems approach will also mean that the technical, financial and human factors in a project are considered together, with each seen as key to the overall vision of that project. To ensure that the systems approach is successfully implemented in a project, the above principles need to be used as a checklist to give confidence that the project is being managed as a whole, with an overview and control maintained for all aspects of that project.

Treat procurement as part of a wider project and take a systems approach to that wider project.

2.3 Specification and planning

The right specification is absolutely crucial for successful procurement, and this can only be achieved if the requisite period of time is devoted to planning. At the start of any project, the client must rigorously define their needs and then convey them in a clear and consistent way to contractors.

Good engineering is fit for purpose, but the purpose of a project has to be defined by the client by means of the specification. The success or failure of a procurement project often has its origins in how the client has defined the project and the ability of the client to understand the potential solutions put forward by the contractor.

In order for the project specifications to be set correctly, the client must have an understanding of how to define the project parameters and give enough information to the supplier so that they can provide the right solutions and budget for their work correctly.

THE KEY STRENGTHS OF A SYSTEMS APPROACH ARE THAT IT TAKES A HOLISTIC VIEW OF THE PROJECT AND IDENTIFIES THE INTERACTIONS AND INTERDEPENDENCIES OF INDIVIDUAL ELEMENTS OF THE PROJECT

³ *Creating systems that work: principles of engineering systems for the 21st century*, The Royal Academy of Engineering (June 2007). Available here: www.raeng.org.uk/education/vps/pdf/rae_systems_report.pdf

By planning all aspects of a project, the sections of work that are more likely to cause delays and failures can be identified early and monitored consistently throughout the whole scheme.

Invest in a significant period of planning and specification, with clear gateways and reviews.

2.4 Intelligent clients

An intelligent client is critical to the success of procurement. This can be a challenge for government where relatively few civil servants have substantial experience and expertise in engineering or business and commerce. Developing commissioning skills is key to creating intelligent customers in government. There can be a language gap between engineers and civil servants, and this barrier to communication needs to be acknowledged and addressed to support successful outcomes to engineering procurement projects.

Government departments are often driven by a political timetable that forces the project pace. This could result in a failure to adequately specify realistic targets for a project. Poorly identified requirements inevitably lead to changing the specification of a project partway through, which will add to the project cost and delay the procurement outcomes.

An intelligent client must be competent and aware of the industry they are commissioning for or have the capacity to draw on the expertise of advisors who can give guidance on the specifications and tender proposals for a project. By not having the embedded knowledge of an industry, a commissioner may not have the understanding to distinguish between an inaccurate or underpriced tender from a proposal that covers the whole project cost lifecycle. This can lead to commissioners unknowingly accepting tenders that are priced under value or contractors deliberately submitting a low bid in order to secure a contract. An underpriced tender can easily lead to the collapse of both project and contractor, despite the use of contractual protections such as penalty clauses.

Clients need commissioning skills in order to be actively and effectively engaged in the procurement.

2.5 Incentivising the right behaviour

The existence of a sound process does not itself guarantee success; process must be accompanied with effective behavioural motivators to ensure that all stakeholders in a project are incentivised to work positively to meet its vision and priorities. In short, the right people need to be encouraged to do the right things.

Once clarity of vision has been achieved and the right processes have been put into place, there needs to be a buy-in to the project from all the parties involved. The project leaders must totally believe in the change that the project is seeking to make and demonstrate this change in their own individual behaviours and the way that they represents the values that they are seeking to bring about.

**AN INTELLIGENT CLIENT
MUST BE COMPETENT AND
AWARE OF THE INDUSTRY
THEY ARE COMMISSIONING
FOR OR HAVE THE CAPACITY
TO DRAW ON THE EXPERTISE
OF ADVISORS WHO CAN
GIVE GUIDANCE ON THE
SPECIFICATIONS AND TENDER
PROPOSALS FOR A PROJECT**

Managing change and creating behavioural change are some of the most difficult things anyone can do in any organisation and, the bigger the organisation, the harder it is to do.

Sir John Armitt CBE FREng

Process alone is not enough: we need motivators to encourage all players to engage in the right behaviours.

2.6 Supporting innovation

Procurement contracts can be a valuable opportunity to stimulate innovation. Introducing innovation at any stage of a project will bring in a set of risks and unknown outcomes, but can also bring rewards that can have wide and lasting benefits.

While specification is crucial, it should not be overly prescriptive, allowing new products and services to become introduced into public procurement. When a client asks for an innovative product, the supply chain is given a chance to produce new ideas and introduce their potential developments into the industry.

When an open channel of communication between a client and supplier is established, the commissioner can become a reliable and supportive lead client who procures new designs and products from industry. This should benefit smaller companies within the supply chain and give government the chance to invest further in growth and innovation.

Having a limited budget or a complicated specification should be seen as a valuable opportunity to introduce an innovative solution. Further discussions on the role innovation plays in procurement can be found in Section 3.

When the client says that they haven't any money, or they have only so much money - 'I want a brilliant product, but I only want to pay £150 for it' - that should set any engineer's mind racing because this is an opportunity.

Sir John Armitt CBE FREng

Innovation carries risk, but it can also deliver big wins.

2.7 Managing risk

In order for innovative procurement to be successful, risks have to be managed and mitigated. Risk management balances the risk against the measure of innovative gain. Different appetites for risk exist in different projects and sectors.

On large infrastructure development projects, reliability is a key concern, so mature technology is often preferred. But in novel projects, new technologies are often required. In these cases, there needs to be

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ICT ALSO HAS TO CONSIDER ADDITIONAL ASPECTS OF RISK THAT ARE VERY SECTOR-SPECIFIC, INCLUDING THE RISKS THAT COME FROM CONNECTING A NEW NETWORK TO AN EXISTING SYSTEM AND THE RESULTING POTENTIAL THREATS TO THE SYSTEM'S SECURITY

an understanding of the risk and cost associated with the innovative technologies and services that need to be deployed.

In ICT in particular, innovation is a constant; however, the traditional principles of engineering good practice must prevail to ensure a desired outcome. ICT also has to consider additional aspects of risk that are very sector-specific, including the risks that come from connecting a new network to an existing system and the resulting potential threats to the system's security.

It is not just the responsibility of the client to take into consideration the risks associated with a project. Contractors have a responsibility to ensure that their client understands the potential options being put forward, their complexity and the risks they present. This is particularly the case if innovative technologies or new ways of working are being proposed: the implications must be made explicit to the client.

The public sector is by its nature very risk averse. However, establishing and accepting an appropriate level of risk is an essential precursor of innovation. Please refer to section 5.1 for more information on the apportionment of risk.

Further discussions on the risks that innovation brings into procurement and how this risk can be mitigated can be found in Section 3.

Public sector projects and procurement carry risk, and while public money should be well-managed, getting the right balance of innovation and prudence is essential.

CASE STUDY

The construction of the Olympic Park for the London 2012 Olympic Games

The Olympic Delivery Authority (ODA) made savings of over £1bn from the final budget of £8.1bn for the venues, infrastructure and transport of the Games. This saving was attributed to intelligent and collaborative planning, strict cost controls, efficient procurement and strong leadership within the ODA.

The clarity of vision that was demonstrated in the planning of the project gave the supply chain an opportunity to become culturally aligned with the ODA's vision for the works.

The success of the London Olympics was due to extensive project planning and faultless execution and commissioning. The project timeline was divided to two years of planning, four years of construction and one year of commissioning trials and final logistics preparation as part of the approved seven-year plan.

In this project, the deadline was the key, guiding priority, with an absolutely steadfast delivery date - for obvious reasons. This allowed the ODA to make clear prioritisation between timescale and other pressures such as cost.

3. Impacts of good procurement: innovation and growth

OPENING UP THE PROCUREMENT PROCESS TO NEW ORGANISATIONS ALLOWS ALTERNATIVE IDEAS AND TECHNOLOGIES TO BE PUT FORWARD THAT CAN IMPROVE PUBLIC SERVICES

3.1 Procurement as a stimulus for innovation

A successful procurement strategy can be effective in driving creativity in projects and introducing innovative solutions to established industries. Innovation in procurement can be beneficial at various stages in the procurement process - including during the tendering phase, when an alternative scheme is proposed to the client that can reduce cost or change the way that a process has been carried out in the past.

Procurement can also be used to stimulate investment in new products and can be used as a platform to develop future technologies. Opening up the procurement process to new organisations allows alternative ideas and technologies to be put forward that can improve public services.

Technology and process innovation are both needed but their suitability can vary depending on the industry they are being used in. Innovation always introduces risk, but if the risk of choosing an innovative product or process mitigates a greater risk, then it is a risk worth taking.

“Most of your [Cabinet Office’s] cost base reduction was in reducing the amount of money that was spent on consultants and actually reducing the amount of people you have in procurement. This is more or less a one-off, however, and you cannot continue to do that. You can squeeze inefficiencies out of something once but then that’s it.

“Innovation will give you continued reduction in the cost base, not by 10 or 20% , but as I will show you, in some cases it will give you 90 % or 99 or 99.9% as in the case of Solexa, one of my billion dollar companies.”

Dr Hermann Hauser CBE FREng

3.1.1 Innovation in the tendering process

Innovative tendering evaluates the parameters of a project at an early stage and looks at alternative solutions to procurement. It is at this stage of the procurement process where taking a systems view of a project and the wider context in which it is being carried out gives the client the opportunity to consider previously unexplored solutions. For example, if savings are

needed in one project to fund another project, it is worth considering whether both projects can be achieved together for least overall cost, or if going ahead with both projects is, in fact, the best solution. Surrey County Council's alternative scheme for the repair and maintenance of the Surrey highways shows the benefits of re-evaluating a project at an early stage and the advantages of exploring innovative tendering options.

CASE STUDY

Surrey County Council - Project Horizon

As part of the Surrey Highways Transformation Project, Surrey County Council has looked at innovative procurement methodology to commission the upgrading of the county's roads.

The Cabinet Office has approved a £90m capital investment programme for the next five years to improve and maintain Surrey roads. The initial proposal for the renovation work was contracted out by Surrey Highways on an annual basis, with six months to design and six months to construct. However, this method of procurement had various negative impacts, including no opportunity to exploit bulk buying, limited opportunity for value engineering and no continuity of work for the supply chain.

The new proposal under Project Horizon re-evaluated the tender conditions and transferred the contract to a five-year fixed road maintenance programme. The new scheme enabled a 15% reduction in overall cost and allowed for long-term planning of a maintenance programme. In addition to the cost benefits, the scheme also implemented a new process for delivering annual surface treatment and identified material and process innovations through an established relationship with the supply chain.

The project has also identified a six-step implementation plan of works that can be employed in similar infrastructure procurement projects⁴.

3.1.2 Procuring innovative products

Procurement can be a platform to invest in innovative solutions but the ambition for the innovation needs to be justified by the value the new product brings. Innovative products should reduce cost, create a wider business benefit or support the development of new technologies. Innovation needs to be taken into consideration as part of the project purpose and be evaluated in terms of the value it brings to the project outputs and outcomes.

By setting ambitious requirements without being prescriptive about how they should be met, there is an opportunity to procure innovative products and services. This can encourage investment into smaller organisations.

Real customers and real contracts are better than grants for driving innovation. Key players in different sectors should articulate their challenges so innovators can meet them.

⁴ Surrey County Council Environment & Transport Select Committee - 8th November 2012. Surrey Highways - Transforming Surrey Highways Briefing Note - mycouncil.surreycc.gov.uk/documents/s1159/Item%20-%20Highways%20Transformation%20Project%20Briefing.pdf

The health sector in particular needs to be clearer in the challenges it needs help to meet. Health R&D is very successful, but there is still not enough investment by the Department of Health in new technology from SMEs. The need to drive down costs in the current climate could be used as an opportunity to think differently on how to procure and deliver services more efficiently.

The fact is that we have probably the second strongest healthcare and biomedical R&D base in the world. We have the largest supposedly joined-up healthcare system, which can be taken advantage of with clinical trials or medical device trials, which should be under our control. We have a device called TSB⁵ and SBRI⁶, but we seem incapable of doing the circuit board to join it all up.

Ian Shott CBE FREng

Manchester Institute of Biomedicine sends site minders out into the hospitals in the Manchester Hospital Trust to find problems. They talk to the clinicians and nurses and find out what is annoying them and then they come back and talk to people who can solve it and see if they can find either a product that exists or someone who can develop it. You need that intermediary piece, because there is a lot about practice and a lot about innovation, to bring the two things together.

Louise Marston, Nesta

3.1.3 Evolutionary versus revolutionary innovation

Innovation can be evolutionary or revolutionary: different kinds of innovation are appropriate to different kinds of projects.

Evolutionary innovation is a result of research and progression of existing design that leads to new and more cost effective methods of producing results. The risks associated with this form of innovation are easier to manage as the incremental developments tend to mean that the associated risks are foreseeable and predictable. Evolutionary innovation does not involve radical shifts in design and therefore can only generate a limited amount of cost saving. Evolutionary innovation may be more suited to the public sector as it carries reduced levels of risk.

Revolutionary innovation involves a complete shift in methodology, with completely new ways of delivering solutions. This form of innovation brings with it higher levels of risk, but the successful outcomes can produce valuable results that can generate major savings and create new and innovative industries, making this form of innovation very attractive to enterprising start-ups and angel investors. Revolutionary innovation is more likely to occur within small teams of people working towards a common goal.

INNOVATION CAN BE EVOLUTIONARY OR REVOLUTIONARY: DIFFERENT KINDS OF INNOVATION ARE APPROPRIATE TO DIFFERENT KINDS OF PROJECTS

⁵ Technology Strategy Board, the UK's innovation agency

⁶ The Small Business Research Initiative is a process resourced within the TSB to connect industry with public sector challenges, in order to stimulate innovation

Evolutionary innovation can be encouraged through procurement.

An example is ODA's invitation to tender for a phthalate-free PVC for wrapping around the Olympic stadium. Initially, there were no bids to supply because of the difficulty of producing a suitable material, but the invitation encouraged some companies to continue to work on the problem and after six months one company, Serge Ferrari, had successfully developed the wrap and was able to supply the ODA⁷.

Sir John Armit CBE FREng

Revolutionary innovations are seen in new methods for sequencing the human genome that brings down cost ten thousandfold. They are also seen in education in the form of MOOCs, Massive Open Online Courses, that can increase productivity (in terms of student numbers) by factors of 100+ and allow education to be responsive to the needs of industry.

Dr Hermann Hauser CBE FREng

3.1.4 Identifying, accepting and managing risk in innovation

As highlighted previously, innovation introduces risk and the risks associated with new designs have to be measured against the financial and social ramifications of failure in each sector. There can be a tendency to err towards risk aversion in the public sector when the financial impact, and public reaction to it, of failures in procurement can be highly significant. While in a commercial setting, 70% success and 30% failure across all ventures would be celebrated; in the state sector where public money is being risked, every failure is scrutinised.

Government needs to find a way of accommodating the potential for failure where there is a desire for innovation or an unavoidable degree of risk. It is also important to note that a 30% rate of failure in procurement projects does not necessarily equate to a 30% wasted cost. By factoring in the risks associated with innovation early in the planning stage, failures can be identified early and a change of direction can be implemented before severe financial ramifications occur.

We need to find a minister, or ministers, who are prepared to say to their departments, 'You are free to make mistakes. You are free to mentally allocate some of what you are doing to the 70/30 projects where, in fact, there is a good 30 per cent chance that it will not work - but the 70 per cent is worth going for, so let's go for that. If it goes wrong, you won't be hanged, but you will actually be praised for having a go. Because we are willing to take a risk, there will be certain things that will be successful.'

Sir John Armit CBE FREng

IN A COMMERCIAL SETTING, 70% SUCCESS AND 30% FAILURE ACROSS ALL VENTURES WOULD BE CELEBRATED; IN THE STATE SECTOR WHERE PUBLIC MONEY IS BEING RISKED, EVERY FAILURE IS SCRUTINISED

⁷ Further information on the project can be found in the Department for Culture, Media and Sport's report *London 2012 - a global showcase for UK plc*; a report by Sir John Armit www.gov.uk/government/uploads/system/uploads/attachment_data/file/77430/John_Armit_Report.pdf

It is not only the investment by the client that is at risk in procurement – the investments made by contractors need to be considered if the client is asking for innovative solutions at the bidding stage. One method that can be used to mitigate some of the risks of introducing innovation into procurement is through introducing a two-stage bidding process, allowing contractors to first put forward plans as to how to complete a project and, if appointed as preferred contractors at this stage, working closely with the client to establish the details of how the project will be delivered and the appointment of subcontractors.

Such two-stage bidding allows for a more mature assessment to be made of risk, programme and cost, leading to better understanding by both parties of the scope of the project and the apportionment of risk before committing to the project. Contractors can then be remunerated for developing innovative ideas even if they do not go on to win the project contract.

A two-stage procurement route could also be used to enable a contractor to test and discuss risks and their mitigation before submitting a final bid. This kind of prototyping would result in greater certainty of cost and programme outcomes. In the construction industry, for unusual or complex projects, it is not uncommon for a limited contract to be awarded first to prototype a particular aspect of the project before proceeding with procurement of the overall project.

3.2 Procurement for growth

The House of Lords Science and Technology Committee's 2011 report, *Public procurement as a tool to stimulate innovation*⁸, encouraged departmental Chief Scientific Advisers (CSAs) to increase engagement between their government departments, industry and the research base. Innovation centres or hubs could also be established within departments, such as the NHS National Innovation or the MoD's Centre for Defence Enterprise. The TSB could also become more involved in the promotion and understanding of innovation within the departments.

Government could support innovation while limiting risk by ringfencing 0.1% of the annual procurement spend (across all of Government, £235 billion in total) for innovative procurement, to be administered by the TSB. This would require the recruitment of experienced specialists to the TSB to manage the budget and projects it is spent on. It could operate alongside or within existing tools such as SBRI. To be successful it would require active buy-in and support from Ministers heading key relevant departments (such as DoH, MoD, BIS).

Dr Hermann Hauser CBE FREng

⁸ *Public procurement as a tool to stimulate innovation*, The House of Lords Science and Technology Committee (May 2011) www.publications.parliament.uk/pa/ld201012/ldselect/ldscitech/148/14802.htm

It should be noted that the most recent Comprehensive Spending Review (CSR) of June 2013 expanded the total amount of departmental budgets which are to be made available for the Small Business Research Initiative (SBRI).⁹

In areas where government is the largest or only customer for a product or service, such as health and defence, government has a greater role to drive innovation. The introduction of a UK-wide strategy could include and guide this kind of proactive procurement approach.

Andrew Wolstenholme OBE FREng refers to 'never waste a good crisis' and this is exactly what we have. There is the imperative of not having any money and of having to be competitive and, if you like, we can call that a crisis which is our imperative at the moment.

Peter Hansford FREng

**IN AREAS WHERE
GOVERNMENT IS THE
LARGEST OR ONLY
CUSTOMER FOR A PRODUCT
OR SERVICE, SUCH AS
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GOVERNMENT HAS A
GREATER ROLE TO DRIVE
INNOVATION**

⁹ Up to £100m. See HM Treasury Spending Round (June 2013). www.gov.uk/government/uploads/system/uploads/attachment_data/file/209036/spending-round-2013-complete.pdf

4. Reforming public procurement: the changes made by UK government

Government has taken extensive steps to improve public procurement through reviewing and reforming procurement practices across departments and putting in place metrics to measure the outcomes of these policies.

Government is working to ensure that procurement officials are highly-trained specialists, and has a drive towards a commitment to complete procurement processes in 120 days. Government is also seeking to engage more proactively with SMEs, building an aspiration to have 25% of contract value directly or indirectly involving SMEs (including where they benefit as part of supply chains).

The National Audit Office publication *Initiating successful projects*¹⁰, addresses such issues as the need for planning at the beginning of a project and the need for commercial skills in government teams. The sections below set out some of the major changes that government is making.

4.1 Cabinet Office Efficiency and Reform Group

Government's Efficiency and Reform Group (ERG) aims to get a better understanding of the optimum balance of information between clients and suppliers and explores how government can change behaviour in procurement.

ERG supports central government departments to deliver efficiency savings in order to reduce the deficit and introduce saving into government departments.

One of the main areas that ERG is working on is the introduction of the Lean Standard Operating Procedures.¹¹ Working with key partners, ERG reviewed

¹⁰ *Initiating successful projects*, National Audit Office (December 2011) www.nao.org.uk/publications/1012/initiating_successful_projects.aspx

¹¹ *Government sourcing: a new approach using LEAN*, HM Government (2012) - ccs.cabinetoffice.gov.uk/sites/default/files/files/Government%20Sourcing%20-%20A%20New%20Approach%20using%20LEAN.pdf

existing procedures and identified opportunities to streamline them and developed new guidelines that could make the procurement process as lean as possible. Significant improvements have been seen in the procurement timescale when new lean methodology has been incorporated.

4.2 Commissioning Academy: creating expertise in government

The Commissioning Academy, set up by the Efficiency and Reform Group, is a platform to allow the transfer of skills and experience between civil servants. The Commissioning Academy will bring public sector commissioners together to discuss their experiences of good practice in procurement and what more can be done to improve government spending. The aim is also to share the experiences of business and industry leaders, to foster a more commercial mindset in government officials.

Through development days and in-depth discussions with successful commissioners, the Commissioning Academy aims to give new and inexperienced commissioners the tools to be innovative in their work and transform procurement practices and redesign how public services are delivered.

4.3 Public procurement pipelines

In April 2012, government published data on 13 pipelines of future procurement opportunities across a range of sectors. Pipeline notices on Contracts Finder¹² give a supplier advance notice of opportunities that might be offered. Confidence levels alongside each notice give the supplier an indication of the likelihood of the contract's availability.

The pipelines are part of government's procurement pledge that aims to support economic growth through public procurement, with an open door policy to new suppliers. The pledge is to:

- develop a more strategic relationship with current and future providers
- engage in effective pre-procurement dialogue with the supply market before starting the formal procurement process
- engage potential providers and their representative bodies where appropriate, when establishing which contracts or programmes will be broken into smaller contracts, thereby increasing access to public procurement opportunities for smaller providers¹³.

The Infrastructure and Construction pipelines can be found through an active spreadsheet on the Treasury's website¹⁴.

¹² See Contracts Finder website: www.contractsfinder.businesslink.gov.uk/Common/Browse%20Pipelines.aspx?site=1000&lang=en

¹³ See Procurement pledge, Cabinet Office website: procurement.cabinetoffice.gov.uk/policy-capability/key-procurement-policies/procurement-growth

¹⁴ See pipeline activity on HM Treasury website: www.uk-cip.org.uk/

**SMES PLAY A CRITICAL
ROLE IN PROCUREMENT
AND WILL BE IMPORTANT
TO DRIVING INNOVATION**

4.4 Involving SMEs

SMEs play a critical role in procurement and will be important to driving innovation. Efforts are being made to make it easier for SMEs to work with government; however, engaging small and medium size enterprises has proven to be a challenge.

The roles that SMEs play in industry and innovation vary between sectors and sponsors. A 'one-size-fits-all' approach to SME involvement is not helpful and each sector must be assessed individually. SMEs cannot carry the same level of risk that large suppliers can absorb; therefore, SMEs can expose the procurement project to a higher degree of failure.

ERG has put in place measures to invite SMEs further into public procurement and has introduced a 'Mystery Shopper' facility that gives suppliers the opportunity to identify and highlight practices that exclude SMEs.

5. From principles to practice: ICT and infrastructure

Government is undertaking much work to improve procurement practices; however, sharing of best practice experiences between different departments is still not routine practice. There needs to be a common language between departments that can be used to promote good examples so that they can become common practice. Without communication, the same behavioural issues that lead to bad procurement practices will be repeated across government departments.

Best practice can be very sector specific; comparable examples of good procurement are often found within the same industry. However, it is still possible for different departments to find common ground and compare like-with-like examples. The ICT, and infrastructure and construction industries have a set of challenges that were considered individually through the workshops held by the Academy.

5.1 Procurement in ICT

There are a number of specific challenges that are associated with ICT procurement. Unlike construction procurement, where there is likely to be a set of known deliverables, in ICT there tend to be more uncertainties that occur during the implementation of a new system. An ICT project manager must be aware of these unique risks and allow for them in the plan of works.

5.1.1 Changing procurement practice in ICT: the challenges

The move from monolithic to dispersed contracts

One of the main barriers that prevents new companies becoming involved in ICT procurement is in relation to how contracts are outsourced. ICT

procurement projects are tendered out in a monolithic way so that there is little clarity over exactly what a project involves and how it can be broken down into sub-projects. These monolithic contracts can only be tendered for by large suppliers who can take on the complete project and the significant risks that come with it.

In order for a wider range of companies to become involved in procurement, these monolithic contracts must be disaggregated and the boundaries and interfaces of the risks associated with and across each section of the work clearly defined. Shifting from a culture of large-scale contracts to an ecosystem of SMEs is a major challenge for government. The individual procurement contracts, once disaggregated, need to be clearly defined and government, as the client, must have explicit knowledge of each of the individual components.

Commercial and behavioural barriers exist that need to be addressed before monolithic contracts can be disassembled. Currently, there is a tendency to tender out procurement contracts to a well-established set of large providers. This prevents new organisations becoming involved in procurement and may cause established contractors to not propose competitive prices and more efficient designs.

Apportioning risks

Another barrier preventing small companies from becoming involved in procurement is that they do not have the capacity to take on the risks that are associated with large contracts. By breaking up monolithic contracts and allocating clearly defined contract parameters, smaller suppliers can understand the level of risk they are taking.

For this to be successful, there needs to be a culture where suppliers and procurers share responsibility for identifying and managing risk. Risk cannot be managed unless it has been identified. Close monitoring of a risk mitigation programme that runs parallel to the programme of works will allow failures to be identified early on. Risk in the ICT industry is dynamic and has to be managed accordingly.

In addition to the risks associated with procurement projects, ICT procurement also presents the challenges associated with cyber security. It is imperative that the required level of security is fully considered at system level and the appropriate design decisions are made based on this. Good security cannot be retrofitted and contractors need to take responsibility for the security aspect of the work they do as well as the project delivery.

Budget allocation

There is a need for a more robust approach to the costing of projects from the outset and for financial risk to be factored in. An intelligent client must be able to evaluate quotes and not just opt for the cheapest tender which can in many cases be suboptimal. This tender cost should also include the total business-change cost of the system as well as the individual cost of the ICT elements. Costs and risks should be considered together so that under-priced projects do not get the go-ahead.

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IT IS THE SYSTEMS ARCHITECT'S RESPONSIBILITY TO ENSURE THAT THE VOICE OF THE CLIENT USER IS HEARD, AND THAT FUNCTIONAL SPECIFICATIONS ARE PROPERLY FINALISED AND UNDERSTOOD

The challenges of taking on risk in a project need to be clear and measured against the value that the project will bring. An issue that needs to be addressed in agile contracts is that an accurate budget cannot be determined until the complete scope of the contract has been defined.

A culture of open communication will allow a contractor to explain to the client in clear terms when a specific product they have requested will not fit the allocated project budget and will also prevent misconceptions about the project outcome.

5.1.2 Changing procurement practice in ICT: the solutions

Systems architect

Breaking up monolithic contracts will allow individual project elements to be allocated to different suppliers; however, in order for the overall procurement project to be successful, there needs to be a 'design authority' or systems architect who manages and maintains an overview and control of the whole project.

The systems architect will have a complete systems view of the project - from initial scheme phase to delivery and operation - and ensure that all the individual contracts are delivered successfully. It is the systems architect's responsibility to ensure that the voice of the client user is heard, and that functional specifications are properly finalised and understood. This should be a bulwark against 'function creep'.

The systems architect needs to be experienced in ICT procurement, have a strong understanding of the risks associated with ICT projects and be a consistent guiding hand throughout the whole duration of the project.

Agile contracts

Agile contracts allow for a better dialogue between client and provider by absorbing a certain amount of change and development as the project progresses. However, agile contracts require that the project is already well-defined and the development team is familiar with the required system architecture.

The Digital Services framework has been put together jointly by Government Procurement Service (GPS) and the Government Digital Service (GDS) to support the Government Digital Strategy. It was established to make it easier for companies that use agile methodologies to access government contracts, and for government to have access to the talent and resources that it needs for digital services. GPS and GDS believe that the framework will attract a big range of suppliers, old and new, and are looking for a wide geographical spread of expertise. The framework launched at the end of 2013.

'Fail early'

ICT projects evolve rapidly and, if a system is not deliverable in a particular form, it must be acknowledged early in the process and addressed. There needs to be a culture that it is acceptable to fail as long as you fail early.

Key to good systems thinking is the identification, right at the start of the project, of the critical interfaces where failure could occur. Demonstrations and sliding-scale checks that fail to test the complex sections within a system should be avoided. Having a holistic view of the project will examine whether the business change that the ICT elements serve is what the client actually needs.

There is no such thing as an ICT project in isolation from a business change project; often ICT is blamed when the broader business change has been poorly managed.

Dr Martyn Thomas CBE FREng

High-profile failures can cast a shadow, especially in government procurement projects. It is important that procurers give suppliers the opportunity to feed back their concerns on the proposed programme of work in an open, transparent and timely manner. In response to this, it is the procurers' responsibility to ensure the supplier properly understands functional requirements and the users' operational preferences.

CASE STUDY**Amadeus - IT solutions provider to the global tourism and travel industry**

Amadeus IT Group is the largest provider of transaction processing services to the global travel industry and can process more than one billion transactions every day with a typical response time of 0.3 seconds. This represents a peak of some 17,000 transactions a second.

Amadeus has successfully transitioned from a monolithic mainframe core using the IBM Transaction Processing Facility (TPF) to a distributed environment based on thousands of individual servers running 'open source' software. This has been a major transformation requiring careful planning and investment over several years, which has facilitated a raft of new business opportunities.

Amadeus' model is an example of a successful transition from a monolithic to distributed systems in the private sector.

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5.2 Procurement in infrastructure and construction

Government has taken significant steps to improve procurement in infrastructure and construction through the Major Projects division of the Efficiency and Reform Group in the Cabinet Office and Infrastructure UK within HM Treasury. However, it still is faced with the challenge of how to communicate examples of successful procurement across all government departments.

5.2.1 Changing procurement practice in infrastructure and construction: the challenges

Intelligent clients

When procuring products, it is important to have project managers who are open to asking questions of the supply chain and are experts in the fields they work in. Allowing a supply chain that you trust to deliver the most effective product opens up the process to innovation. The most intelligent customer is not necessarily the most technical person, but the person who has an understanding of the system and is an effective communicator.

International examples of good practice show that successful procurers have trust in their supply chain and that trust is reciprocated; the procurement process is delegated to capable people and therefore projects are done well. Sharing your vision for a project with the supply chain will give all participants the chance to adjust their priorities and standards of work to the project and become culturally aligned with the client.

CASE STUDY

Ministry of Justice

The Ministry Of Justice has operated a lean procurement system¹⁵ for some years and works with a strategic alliance of constructors that now have cultural alignment with the MoJ. Data from previous projects delivered is distributed within the department through the intelligent use of Building Information Modelling (BIM) and standards and specification libraries.

HMP Cookham Wood young offenders' institute in Kent proved a major success embedding BIM into a lean and collaborative procurement and delivery process.

To date MOJ have achieved 20% project cost reductions and 70% of projects completing on programme.

Terry Stocks - Head of Project Delivery Unit, Ministry of Justice

¹⁵ Lean procurement embodies a set of principles which are designed to maximise the efficiency of government procurements, setting out a clear path from the required business outcome to the award of a contract.

Clarity of vision and correct specifications are vital in infrastructure procurement. It is valuable to develop a roadmap that every participant can follow, and this will reduce inefficiencies and repetition of mistakes.

The procurement environment

The right procurement environment is essential for good practice; decisions need to be made quickly so that the project timeline does not become delayed. Committee structures and decisions being passed on from official to official are not suitable for a fast-paced industry environment. In order for government to be able to act as an effective commissioner and operating body, there needs to be an adjustment of the procurement environment to suit this role.

Having a thin government structure where decisions are made by a small number of people is more conducive to good procurement. There needs to be a single client or a small group that can make decisions appropriately and consistently.

The Olympic Delivery Authority had a process which guided buyers on delivery, budget, health and safety and sustainability factors. The robust mechanism that the project was built on along with the presence of a thin client helped pull through innovation and collective thinking in the team. The model employed by the ODA could also be applied to other sectors.

The contractors that were involved in the delivery of the Olympics became very experienced in delivering large projects. It would be valuable for government to ensure that the insights and experience gained by both parties on such major projects were shared with other commissioning teams within government.

Whole-life costing

A procurement budget needs to take into account the whole-life cost of the project and not just the price of the products and services being bought. The parameters of a project should be defined by the client and include the cost of delivery of the project once the construction has been finalised. The whole-life cost and maintenance of a project should be allowed for within the budget.

Operation and maintenance of infrastructure are major parts of its cost and should not be regarded as a secondary consideration. As a result, the procurement strategy in infrastructure cannot be fully put in place until the operating and maintenance strategy is confirmed.

THE OLYMPIC DELIVERY AUTHORITY HAD A PROCESS WHICH GUIDED BUYERS ON DELIVERY, BUDGET, HEALTH AND SAFETY AND SUSTAINABILITY FACTORS. THE ROBUST MECHANISM THAT THE PROJECT WAS BUILT ON ALONG WITH THE PRESENCE OF A THIN CLIENT HELPED PULL THROUGH INNOVATION AND COLLECTIVE THINKING IN THE TEAM

CASE STUDY

Lessons learned from HS1 that can be applied to HS2 - A lecture by Tim Stuart, Head of Engineering and Operations, HS2 Ltd¹⁶

The high speed rail network connecting London to the channel tunnel was completed in two stages. Stage 1 connected the tunnel to Waterloo Station; stage 2 extended the line to St Pancras Station. The project also included the regeneration of existing stations on the proposed route.

HS1 had a clear initial objective to create a good transport link between the channel tunnel and central London, and to improve regional growth along the Thames gateway. The development initially had substantial public concern within its two year consultation period.

Key factors that were planned into the project framework that were instrumental to success included:

- Clear recognition of the different phases of the project with a proper definition of the components of the work.
- Having the right people with the right attitudes and competency.
- Strong leadership from the client, London and Continental Railways.
- The client also being the project manager.
- All parties being involved early in the project decision making.

HS1 had a culture of being right first time on all design and worked on the basis of promoting from within. The core team worked on the project for 20 years, many members of which had worked previously for British Rail.

The valuable lessons that can be learned from HS1 that can be used for HS2 project include:

- Clear roles and responsibilities are essential.
- Integrated project manager and designer with corporate support and authority to act worked well.
- A small, focused client is good and effective.
- A simplified approval process is required, and great effort must be taken to prevent duplicated method statements.
- A strong on-time culture with early contractor involvement is essential.
- Design must be done with operation and maintenance in mind.
- Detailed logistical planning is essential.

THE CORE TEAM WORKED ON THE PROJECT FOR 20 YEARS, MANY MEMBERS OF WHICH HAD WORKED PREVIOUSLY FOR BRITISH RAIL

¹⁶ See IET website: <http://tv.theiet.org/technology/transport/17357.cfm>

5.2.2 Changing procurement practice in infrastructure and construction: the solutions

Leadership from large contractors

In the case of public sector infrastructure procurement, in order to give the most opportunity for non-competitive and collaborative relationships, there are cases that show that it is more productive to contract the totality of a project to the biggest single organisation which would then distribute the work to their own subcontractors. This was practised during the construction of the Olympic parks, where each individual structure and infrastructure project was commissioned explicitly to a contractor who could then disseminate different parts of the work to their own subcontractors.

In infrastructure and construction, unlike in ICT, it is important to have larger contractors who can take on the risks and professional indemnities associated with big government contracts. These large organisations can then transfer the work to their own supply chain and help smaller suppliers become involved in public procurement projects.

Sharing skills and enabling communication

The cultural alignment of various government departments has gained more traction in the spending review but government is keen to push this even further and explore how to grow a culture in procurement practice. For government it is crucial that leaders in successful projects communicate their good practices to other departments.

There is currently dialogue between government and industry that can be built on. Government can use this opportunity to show leadership by making long-term investments in changing procurement practices.

It would be in industry's interest for commercial organisations to help government become a better client. There is not a hard barrier between government and industry, and graduates who are all-rounders should be encouraged to move from industry to civil service at various stages of their career.

By opening up communication channels between government and its suppliers, industry can give guidance on how government should best specify its requirements and what new products could fit its needs more effectively.

Making best practice common practice

The really pressing question for government is how to take good practice and make that consistent throughout all departments. Individual government departments are still very independent and therefore transferring best practice between sectors is difficult.

BY OPENING UP COMMUNICATION CHANNELS BETWEEN GOVERNMENT AND ITS SUPPLIERS, INDUSTRY CAN GIVE GUIDANCE ON HOW GOVERNMENT SHOULD BEST SPECIFY ITS REQUIREMENTS AND WHAT NEW PRODUCTS COULD FIT ITS NEEDS MORE EFFECTIVELY

GOVERNMENT IS INTERESTED IN USING THE EXPERIENCES AND EXPERTISE OF INDUSTRY TO DEVELOP PROCUREMENT PRACTICES, BUT FOR THIS TO BE EFFECTIVE, INDUSTRY REPRESENTATIVES SHOULD CONSULT WITH GOVERNMENT IN A CLEAR LANGUAGE AND UNIFIED VOICE

Practices currently vary across government departments; being more consistent in approaches to procurement will help industry understand how they should bid for government contracts and how they should deliver contracts to government.

Government should maintain a systematic record of the repeated efficiencies found in procurement processes across different departments. These should be examined for their replicability and considered for inclusion in procurement guidelines.

Government is interested in using the experiences and expertise of industry to develop procurement practices, but for this to be effective, industry representatives should consult with government in a clear language and unified voice. Industry would also need to be involved in a project early enough to influence the project process.

Tools and technologies that can help

The fragmentation of industry means that examples of best practice can sometimes get lost without experiences being captured to be drawn upon again. However, industry now has more tools than ever that can help capture experiences and good practice examples and maintain ties to suppliers and contractors who have worked on successful government contracts.

BIM

Building Information Modelling (BIM) is an opportunity to bring in the right system factors and connect projects to drive more consistent behaviour. BIM gives the client a platform to detail their specific product requirements and note the criteria for procurement. The BIM model can then be distributed to suppliers who can use the information on BIM to tender for projects or to introduce potential innovative solutions around the client's set requirements.

BIM gives government a platform to collect data from a range of procurement projects and records instances of successful procurement. There are many good examples of public procurement that can be used as models for future infrastructure and construction projects.

The Ministry of Justice has already produced architectural BIM models for large prisons in Wales. These models can be used as a platform to store information and share lessons learned and give design information to tendering contractors. Contractors can then use the model to tender against and have the opportunity to bring forward ideas that they believe would improve design or reduce cost. This reduces tendering cost for the Ministry of Justice and in the long-term allows investment in best practice.

CompeteFor: outreach to SMEs

CompeteFor is an online resource that enables businesses to compete for contract opportunities in public and private sector procurement. The service was used successfully for the tendering process of the 2012 London Olympics and is now being used to find suppliers for the Crossrail project¹⁷.

¹⁷ See CompeteFor website <https://www.competefor.com/business/login.jsp>

The online service matches buyers to suppliers and is a useful resource for small businesses to become involved with larger public sector projects. CompeteFor also gives buyers the opportunity to find local suppliers that match their requirements as part of the Supply National SME Engagement Programme¹⁸.

The original CompeteFor vision was to provide availability of London 2012 business opportunities and create a legacy of increased capacity and expertise.

With 75% of over 12,000 opportunities awarded to SME organisations, the programme continues to be used today by public sector buyers such as Crossrail, ensuring smaller subcontractors don't miss out on those all-important growth opportunities¹⁹.

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RESOURCE FOR SMALL
BUSINESSES TO BECOME
INVOLVED WITH LARGER
PUBLIC SECTOR PROJECTS**

¹⁸ See Supply Contracts website https://www.supplycontracts.co.uk/subscriptions/cgi-bin/registration.cgi?c4_supply=1

¹⁹ <https://www.competefor.com/business/visionAndObjectives.html>

6. Conclusions and recommendations about how to change the practice

The main lesson of the Academy workshops was the value of taking a systems-level overview of projects and thinking about procurement within the whole project planning process. This allows the following essential aspects of good procurement to be fulfilled:

- Long-term leadership and a clear, concise vision are essential in any major project.
- Procurement should be treated as part of a wider project and take a systems approach to that wider project.
- There is a need to invest in a significant period of planning and specification, with clear gateways and reviews.
- Clients need commissioning skills in order to be actively and effectively engaged in the procurement.
- Process alone is not enough - all players need to be motivated to engage in the right behaviours.
- Innovation carries risk, but it can also deliver big wins, in individual projects and for the future.
- Public sector projects and procurement carry risk, and while public money should be managed well, getting the right balance of innovation and prudence is essential.

Looking in particular at the IT and infrastructure sectors, there were further lessons learned about making procurement successful in practice. These included the importance of:

- achieving clarity of values and drivers, for example related to criticality of deadline, scope of budget, nature of deliverables
- scoping and budgeting holistically for the totality of the business change, not just the ICT
- maintaining continuity of priorities: there needs to be awareness of the impact of moving goalposts during delivery
- engaging SMEs that can play a critical role in procurement, particularly in driving innovation
- allowing flexibility when change is needed for programme success

- having engineers on both the client and supplier sides who speak the same 'language', and are able to successfully communicate the purpose of a project and build successful specifications together
- having the right capabilities in industry and government to communicate and understand the need and the solution
- instating a system architect or design authority with oversight of an entire project
- stimulating the right behaviours right along the supply chain.

As set out in the introduction, the Academy feels that there is a real opportunity for its Fellows to make an important contribution to government's investment in improving procurement process and practice. The Academy can do this by:

- supporting government in its development of procurement principles, by providing expert views on the procurement process
- helping to lead on the practical implementation of the right principles and incentivising behaviour change by providing case studies of successful (and less successful) projects
- providing a high-systems level view through our experts who can be involved in government reviews of procurement activities.

Improving procurement will happen through a partnership between clients and providers, be those clients in government or elsewhere. The Academy's Fellows are committed to making these partnerships successful.

**IMPROVING PROCUREMENT
WILL HAPPEN THROUGH A
PARTNERSHIP BETWEEN
CLIENTS AND PROVIDERS,
BE THOSE CLIENTS
IN GOVERNMENT OR
ELSEWHERE**

7. List of participants

UK procurement roundtables March and December 2013

Name	Organisation
Professor Norman Apsley OBE FREng	Northern Ireland Science Park Foundation
Sir John Armit CBE FREng	Olympic Delivery Authority (ODA)
Tim Banfield	National Audit Office
Dr Peter Bannister	Eykona Technologies
Dr Martin Barnes CBE FREng	Major Projects Association
Professor Chris Bovis	University of Hull, Law School
Andrew Butt	Cabinet Office
Sally Collier	Cabinet Office
Claire Durkin	URS
Andrew Forth	CBI
David Gee	TTP Ventures
Mike Glover OBE FREng	Arup Group Ltd
Mark Glover	Technology Strategy Board
Neil Griffiths	Department of Health
Rear Admiral Nigel Guild CB FREng	Engineering Council
	The Royal Academy of Engineering
David Hall	Highways Agency
Peter Hansford	Chief Construction Advisor
Dr Philip Hargrave FREng	IT KTN
Dr Hermann Hauser CBE FREng	Amadeus Capital Partners
Alison Hood	National Audit Office
Steve Hudson	HM Treasury
Louise Marston	Nesta
Dr James Martin FREng	Mott MacDonald
Ray O'Rourke KBE Hon FREng	Laing O'Rourke
Graeme Philp	Gambica
Mike Putnam	Skanska
Dr John Roberts CBE FREng	RBC Europe Ltd
Ian Shott CBE FREng (Chair)	Shott Trinova LLP
Professor Phil Sutton CBE FREng	Imperial College London
Dr Martyn Thomas CBE FREng	Martyn Thomas Associates
Derek Turner CBE FREng	Highways Agency
Dr Elvira Uyarra	University of Manchester
Heikki Viika	Bombardier
David Waboso FREng	London Underground Ltd
Professor Ian Wallace CBE FREng	Cranfield University
Jane Wernick FREng	Jane Wernick Associates
Martin Williams	BIS

Infrastructure and construction procurement roundtable

Name	Organisation
Sir John Armitt CBE FREng (Chair)	Olympic Delivery Authority (ODA)
Dr Peter Bonfield OBE FREng	BRE
Chris Broadbent Eur Ing	BRE
Prof Tim Broyd FREng	UCL
Andrew Butt	Cabinet Office
Alan Couzens	Infrastructure UK
Sir Peter Gershon CBE FREng	National Grid
Mike Glover OBE FREng	Arup
Dr James Martin FREng	Mott MacDonald
Chris Richards	EEF
Terry Stocks	Ministry of Justice
Prof Phil Sutton CBE FREng	Imperial College London
Derek Turner CBE FREng	Highways Agency
Heikki Viika	Bombardier
David Waboso FREng	London Underground

ICT procurement roundtable

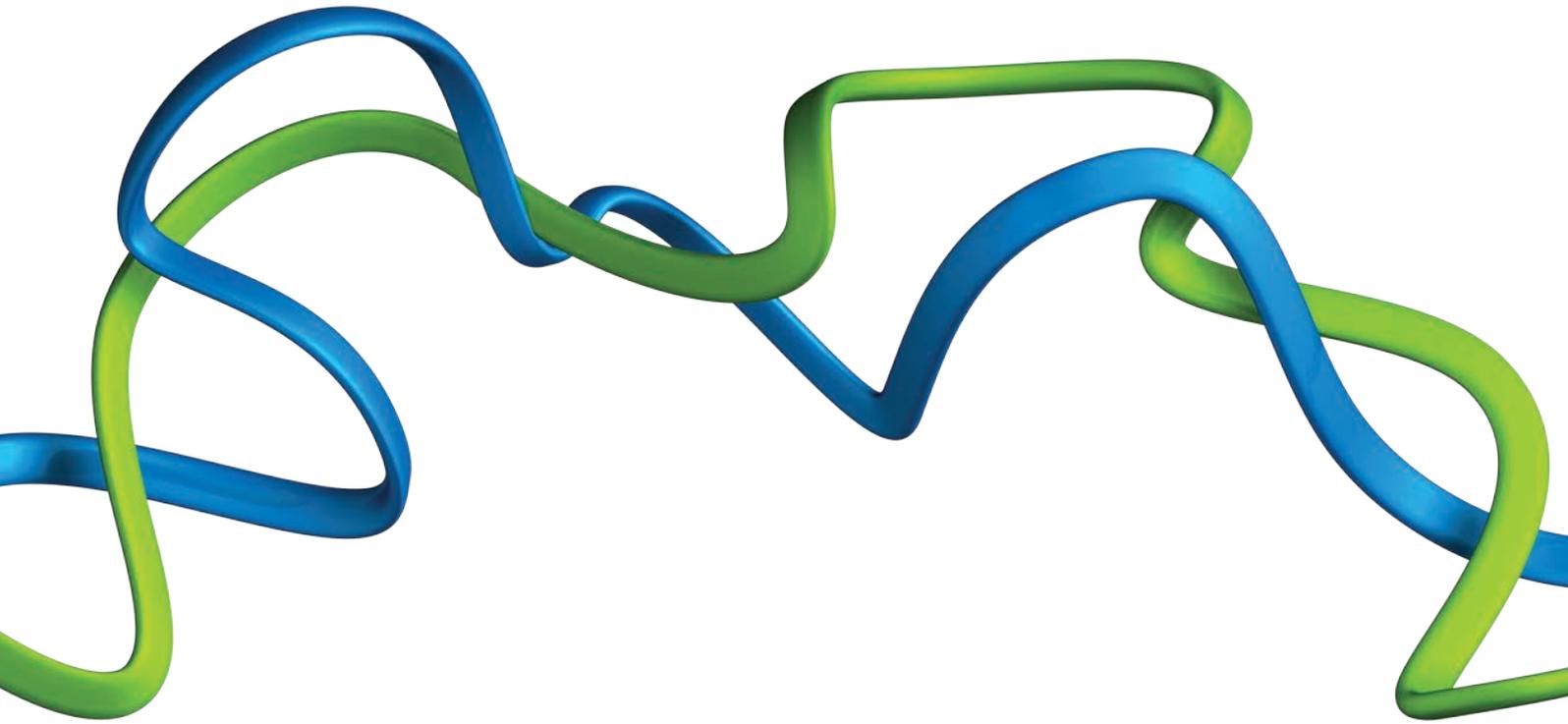
Name	Organisation
Alan Berry	IET
David Evans	BCS
Yvonne Gallagher	NAO
Rear Admiral Nigel Guild CB FREng	
Dr Anthony Hall FREng	
Barry Leighton	DWP
Prof John McDermid OBE FREng	University of York
Gordon Morrison	Intellect UK
Prof Jim Norton FREng (Chair)	
Prof Phil Sutton CBE FREng	Imperial College London
Brad Swan	Government Digital Service
Dr Martyn Thomas CBE FREng	Martyn Thomas Associates
Frank Tudor	DWP

Report prepared by Professor Phil Sutton FREng with support from Academy staff
Dr Natasha McCarthy, Sahar Danesh and Joe Chapman.

Notes



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