


Procurement landscape

Wider, challenging, and in need of reform

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Abstract

It is estimated that the UK Government procures £230bn¹ of products and services per year, with items varying from simple purchases like stationary through to complex investment decisions such as construction.

The construction sector has long voiced its opinion about how efficiencies could be gained through procurement reform. Despite much research and many attempts, progress is still slow and inefficiency remains high.

This report is the first in ACE's procurement series and takes a critical look at the investment process and procurement landscape in a more holistic way than previous reports/ investigations. This landscape is then critically reviewed in light of company, client and individual behaviours and economic theory to try and establish where the issues relating to slow progress actually occur.

The procurement landscape as outlined covers not only the transactional process of buying but also the investment process from its inception through the client process, supply chain engagement and eventually to operation.

This first report aims to transform the language around the procurement debate to one of identifying areas for change. As such, this report suggests the next steps that should be taken into specific areas to ensure future progress is made.

BACKGROUND

The background is a solid light blue color. It features several large, overlapping, semi-transparent curved shapes in various shades of blue, ranging from a very light, almost white-blue to a deep, dark blue. These shapes create a sense of depth and movement, resembling stylized waves or abstract architectural forms. The word "BACKGROUND" is written in a bold, white, sans-serif font in the upper left quadrant.

The term procurement is widely used across the public and private sector, yet talking to various individuals it is apparent that sectors, companies and clients all consider procurement to cover varying tasks.

For example, procurement is generally considered to cover all activities that involve buying, contracting, purchasing, sourcing or tendering. For clients, this process can start at the initial stages of identifying the need for a scheme/project or purchase all the way through to actual purchase and operation of a project.

For the supply chain, however, procurement is generally considered the process through which they go to be a chosen or winning supplier to a project.

Beyond this, policy makers and government look at very specific aspects of procurement such as the importance of using SMEs to deliver projects. They rarely consider, however, the wider landscape and implications of government and management policy, regulatory, approval and purchasing requirements.

This demonstrates part of the problem, how can government, clients and industry look to solve procurement blockages and inefficiencies when few individuals understand or even consider the system in its complex entirety.

As such, it is important that before individual issues are addressed that an overall view of the procurement landscape is outlined and how it operates for all parties involved.

The evolution of procurement research

There has been a wide variety of procurement research undertaken within the area of procurement. This research varies from that which focuses on procurement as a buying process which can be applied to bulk products to gain efficiencies, to more complex projects and construction specific investigations on how developments and improvements can be found going forward.

The following table shows a list of research that has been produced since 1996 and demonstrates the scale of interest and research in this area. There continues, however, to be issues in implementing the recommendations of such reports as highlighted in the 2009 Constructing Excellence Report². Part of the rationale behind the slow progress is a more general lack of appreciation of the complexity, scale and behaviours that drive some of the common concerns that take place within the procurement landscape. This is an area where further progress is needed.

Identifying the whole procurement landscape

This report is the first in ACE's procurement series and takes a critical look at the investment process and procurement landscape in a holistic way. The procurement landscape as we describe it covers not only the transactional process of buying but the investment process from its inception through the client process, supply chain engagement and eventually to operation.

This landscape is very complex with in excess of 40,000³ procuring bodies across the public sector. This, therefore, provides a significant challenge in ensuring that public sector investment achieves the best social and economic outcomes.

1996	Latham Report constructing the Team
1998	Egan report rethinking construction
2000	Best Value, Legislation First PPC200 contract launched
2003	Kelly review - National procurement strategy for local government
2004	Gershon review - Centres of procurement excellence EU rules extended to RSL
2005	Cox review - Sustainable development strategy
2006	Strong and prosperous communities white paper Sustainable procurement action plan
2007	Transforming Government Procurement Strategy National improvement and efficiency strategy Sustainable procurement strategy for local government
2008	Procurement capability review Regional Improvement and Efficiency Partnerships (RIEPs) Operational Efficiency Programme
2009	Roots review of smarter procurement innovation procurement plans Total place
2010	NIP ERG
2011	Government construction strategy, project pipeline
2012	HMEP ERG Lean client and frameworks report
2013	BIS – Construction Strategy 2025 Mystery shopper
2014	Government Procurement Models Prompt payment charter CLG: Local Government Procurement Enquiry- Recommendation UK – Infrastructure Client RouteMap

The importance of the investment process

Procurement within construction is part of a very complex and vital investment process. This process, which enables the public sector to plan, invest, and enable social and economic outcomes with influences far beyond that of the initial investment.

For example, whilst the public sector may invest in or commission the building of a school its social and economic value is in the future economic potential of the students who go through this institution. Another example is that a new road's economic value extends beyond the vehicles that utilise it. Further investment will flow into areas within its reach, stimulating development, or through the movement of additional goods and improving individual consumer choice and job options.

It is, therefore, vital that the investment process outlined in this paper is always considered in light of the social and economic outcomes they can generate as part of a long term and efficient investment process. To think of such actions as purely a transactional affair will only limit the social and economic benefits the public sector could ascertain.

What, and how much does the government procure?

The UK Government estimates that it procures £230bn⁴ of products but despite this the construction sector continues to suffer from the effects of the recessionary period. The latest forecasts suggest that the construction sector will return to its 2007 level of activity by 2017, with output anticipated to grow by 4.7% in 2014 and 4.8% in 2015⁵.

Construction contributes approximately £90bn to the UK economy (approximately 6.8% of GDP)⁶ and employs over 2 million people⁷. Construction should, however, be more widely discussed in terms of its potential to improve long term economic growth and productivity.

Looking more specifically at investment (gross fixed capital formation) and assets which contribute to a productive process for more than one year and are not exhausted in the process of production. (E.g. buildings, vehicles, plant and machinery, computer systems and aircraft) it is revealed that in 2012:

- Dwellings, excluding land amounted to £51bn
- Other buildings and structures amounted to £70bn
- Transport equipment amounted to £6bn
- Other machinery and equipment and cultivated assets amounted to £45bn
- Intangible fixed assets amounted to £36bn

What aspirations have been set for efficiency?

The recent Construction Strategy⁸ which was drafted between industry and government laid out the following aspirations by 2025:

- A 33% reduction in both the initial cost of construction and the whole life cost of assets
- A 50% reduction in the overall time from inception to completion for new build and refurbished assets
- A 50% reduction in greenhouse gas emissions in the built environment
- A 50% reduction in the trade gap between total exports and total imports for construction products and materials

The targets above are very ambitious, and will not be achieved unless the process of commissioning and procurement is significantly and consistently improved and harmonised across a wide range of clients. Only this will deliver an efficient investment process going forward.

Shifting the debate

As demonstrated by the above targets, the construction sector has long discussed the possible efficiencies that could be gained through procurement reform. Despite much effort and several reviews of procurement, progress is inconsistent and potential inefficiency high.

This report aims to change the language around the procurement debate. This needs to be done for several reasons. The first is that by actually outlining clearly the scale of the challenge and processes that take place, parties can be realistic about the potential effectiveness of reforms.

The second is that over time the language surrounding procurement has evolved but has also lost its practical link with the market, business, public, and political realities in which all parties operate. This means the debate has become very narrow and so the discussion needs to rise back above this.

Finally, it is important that procurement in the construction sector starts to evolve beyond the idea of a simple transaction and buying process, to one of a strategic governance of investment.

It is imperative that the debate moves back to one of discussing and researching real and lasting options and change management.

Given the above, following this report ACE will produce further research (as discussed in the next steps section of this report) exploring practical area for change, options for reform and providing suggestions for future improvement.

EXECUTIVE SUMMARY

It is estimated that the UK Government procures £230bn⁹ of products and services per year, with items varying from simple purchases like stationary through to complex investment decisions such as construction.

This report is the first in ACE’s procurement series and aims to change the language around the procurement debate to one of identifying practical area for change. Following this ACE will produce further research exploring options for reform in these areas.

To change such a large debate it is important that all parties understand the points at which change can take place. This research finds that too often parties involved in procurement are trying to enact change as part of the transactional process of buying and not as part of the strategic investment decision making process which sets many of the high level demands and complex conditions for how projects will be procured.

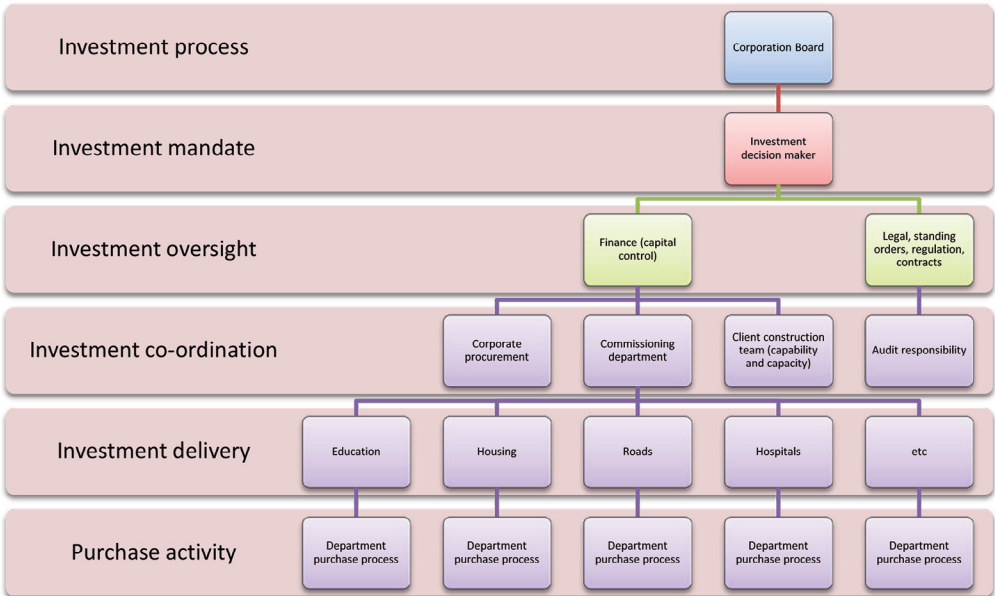
The role of the public sector construction client

There are many factors that influence the procurement method and strategy of a company. Within the public sector commitments to efficiency and the buying of a product extend beyond that of a private company with the transparency and accountability of spending to the electorate also considered vital.

Another challenge in the public arena is the scale and variation of projects procured. Public sector clients procure services and activities from the construction industry across multiple disciplines and sectors including: housing, offices, schools, leisure projects, local authorities, educational organisations, bridges, roads, hospitals, research centres, harbours, and corporate property.

In many cases the public sector Construction Client role actually embraces a diverse range of complex functions located within complex corporate organisational structure which is often ultimately accountable to an elected authority, a public corporation or board. This starkly contrasts with the frequently perceived role of the client as an isolated team or individual.

Furthermore the public sector construction client role incorporates a number of quite distinct phases of operation, skills, practices, roles and responsibilities both internally and externally. This is subject to high levels of internal and external scrutiny as a legal entity, and as well as a service provider, directly subject to political and public accountability and audit.



As demonstrated by the above, even in its simplest form the client's roles, structures and functions are both more complex and diverse than that any simple function description might imply.

Given the complexity of the above limited client skills, structures and practices can have an enormously negative impact on the industry's performance and its willingness to innovate. Skills within the client body need to range from those with a macro view of not only singular project outcomes but also of an investment process as a whole down to the actual commissioning client. This is often a 'mono-functional' client department, for example housing or education seeking to secure specific construction, social and economic outcomes through the delivery of a construction project.

The skills required at each of these levels are not necessarily interchangeable, and as such the traditional view of a simple progression of staff from that of a mono-functional client area to the level of an overarching decision maker is challenging.

It is also important to remember that as one moves up the client's decision making chain, the "legally defined client"(corporate client) is comprised of a number of wider functions with differing responsibilities, objectives, interactions and agenda, which may not be directly aligned to the construction project objectives. For example, they may be more concerned with legalistic, political or governance issues or more frequently on audit requirements, financial control, political risk, transparency, public accountability and satisfaction.

Given the above, high level investment summary, it is now important to understand how such governance structures enable the procurement process to fit within the complex and granular procurement landscape.

The procurement landscape

This report emphasises the need for stakeholders and the supply chain to better understand the process that occurs within the settings of such conditions which define the framework within which the client's needs are identified. This is something that will be further explored in later work in this series.

To do this, however, it is key that all parties have a map of the landscape in which they are operating. This report has undertaken a fundamental and radical review of the landscape, engaging with clients of all sizes alongside the supply chain to create as complete a picture as possible.

It is this detail that will enable the debate to evolve from one of individual points of interest to one that will comprehensively drive an efficient investment outcome and reduce inefficiency. Due to its scale and complexity, this landscape map can be found as a fold out at the end of this report.

Developing, embedding and measuring skills

This report will now explore in more detail the concept behind a skills mismatch. It is important to note that when we discuss skills they are in respect of those required across the whole organisation to scope, develop and implement an investment strategy.

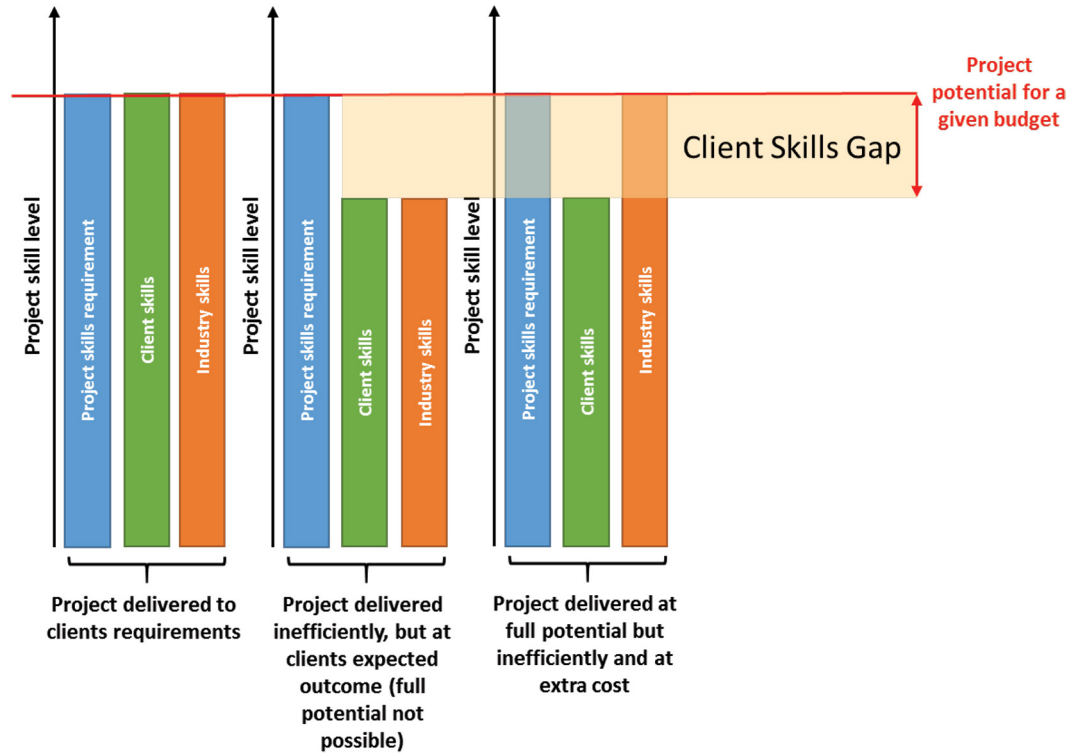
Just having improved skills at the project level will not solve a skills mismatch, if an investment strategy is flawed from the start, an efficient outcome is not possible.

Procurement like any other complex activity is reliant on the skills it has available. There is a large variation in procurement methodologies from traditional through to a totally collaborative approach. The same skills are not required to deliver each of these approaches.

In addition, there is generally a lack of appreciation at the relevance of skills to ensure the public gets the most out of its investments.

Understanding the client skills gap

The first scenario is that of a client skill gap. This is shown more clearly in the following diagram, where the client's skills are below that of the project requirement and, therefore, the investment is delivered inefficiently.



It is important to stress that this does not mean a project is run poorly. A project can be delivered perfectly well, but due to a lack of skills within the client function a better outcome could have been achieved.

For example, the project could have been delivered successfully but due to a lack of knowledge uses 10% more electricity over its lifetime than would otherwise have been the case if the client had been better informed.

Whilst this loss in efficiency does not appear to be significant if you consider that the government spent £694bn in 2012¹⁰ and even a 1% saving would equate to approximately £7bn.

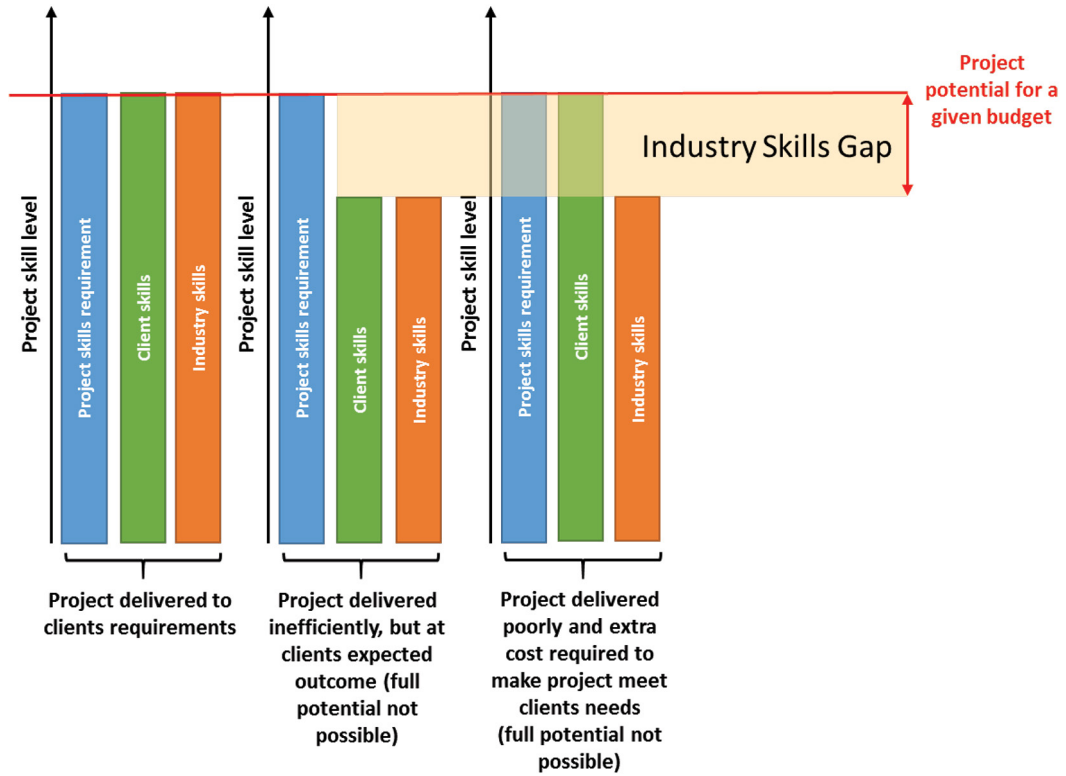
Understanding the industry skills gap

Another possibility is having an industry skills gap. Under this scenario whilst the client has the ability to foresee and wishes to procure an efficient investment given the funds that are available, the industry is unable to meet the requirement.

Some would argue that this scenario is unlikely as a competitive industry will generally match the requirements of a client or would not be awarded the contract.

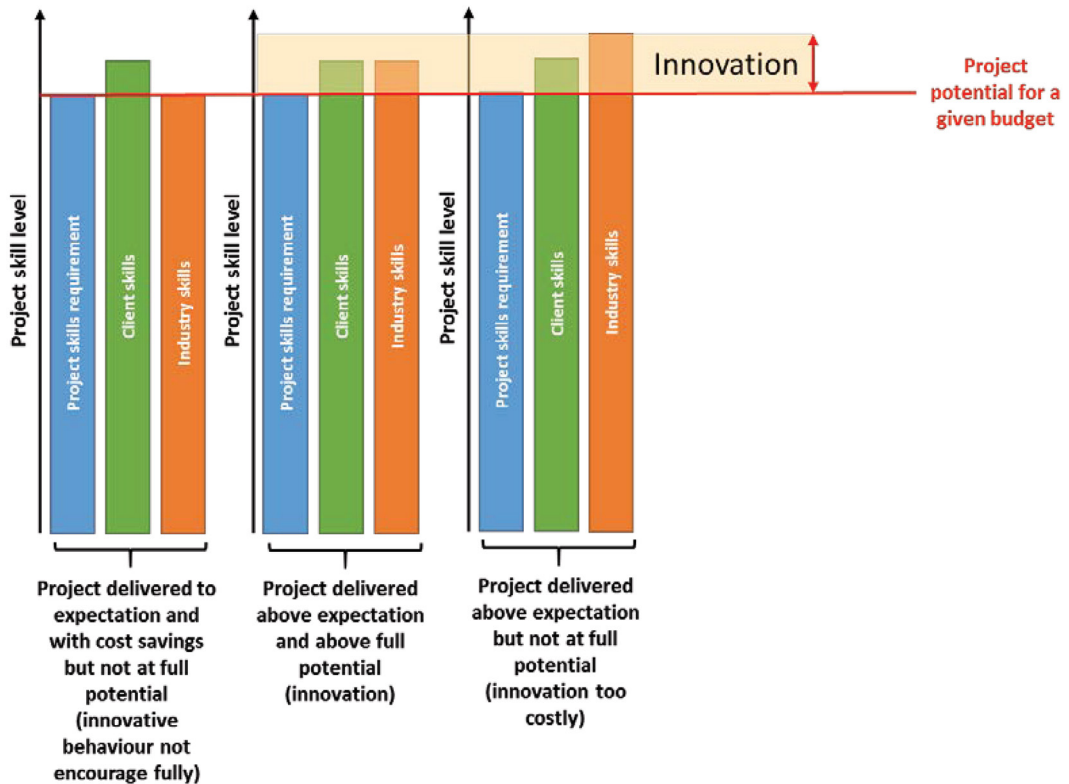
This may, however, happen for a number of reasons such as a skills shortage within the industry, a lack of bidders within the procurement process, an inability to get the required products for project delivery and a difference between the vision and priorities of the client and the supply chain.

Again this has been shown graphically below:



Understanding genuine innovation

The final scenarios are where genuine innovation occurs. That is to say that for a given budget where the expectation is set industry and the client together are able to deliver a project which exceeds expectations given the skills of the team. Again this has been shown graphically below:



The interesting item to note is that in all of the above scenarios whilst the ability to deliver a project can be constrained by industry, the default ability to deliver a project is dependent on the client's skills or lack thereof. That is to say that the clients skills are a definitive constraint, a client is not able to deliver above its skill level.

This may seem controversial, and many will say that working collaboratively industry could bolster the client. This does, however, rely on the client identifying this higher skill level and allowing activity and innovation to occur in a way which ensures the project outperforms their own skill level.

Whereas, if a client does not fully understand the working practices and improvements industry can offer and continues to procure and develop a project to the best of its ability and not industries, it therefore is constraining the outcome.

The above has significant implications for the procurement landscape and will change the nature of the conversation industry needs to have with government on improving the outcome of its investments through the procurement process.

Whilst this report discusses skills at length, government has started to make some progress on developing a common methodology for assessing a client's skill capacity to implement specific procurement mechanisms. This is especially important given the UK's investment needs going forward.

The supply chain and its interaction with procuring authorities

One of the issues faced when discussing procurement is untangling the complex web of interactions between clients and the various tiers of the supply chain (where engagement reduces significantly as you move down the supply chain) and the points at which they are involved within the process.

As is shown in this report this interaction is not only very complex in nature but has also probably been underestimated and underappreciated by all parties in terms of actions that will have a reasonable chance to influence and drive the process of change management.

It is important to recognise that this programme of change management within procurement is not new. Clients and industry have identified and do work together to improve and procure items in the way they feel is most efficient at that point in time.

- What is lacking, however, is a fuller understanding of how these processes fit together, how clients communicate information and needs, how clients come to the decision of these needs, tools to achieve these needs, the balance of cost and responsibility to deliver these needs, the impact on suppliers, and how this is balanced against the ultimate goal of both the single client(s) and across government as a whole.

Industry usually defines the client role to include items such as deciding the procurement strategy, developing the brief, approving suppliers. This view, however, often forgets the role of the key investment decision making process within the commissioning and business case process (the pre-project process). This will include feasibility studies, financial approval, funding, resident and other consultations, controls and approvals, discussions with government, general public consultations, approval process, internal reports and the need for formal reporting to executive and Cabinets and Committees.

All of the above activity takes place amongst a backdrop of a significant need to ensure compliance with wide ranging organisational policy requirements, including corporate procurement policy (PII, Standing Orders, Contract Rules, etc). This must all be in place to

ensure taxpayers' money is accountable and ensure departmental oversight.

This is why despite inefficiencies and issues being identified by the supply chain and as part of many previous studies, the negative impact of a fragmented and inefficient investment decision making process is still impacting on the procurement debate.

The final section of this report, explores the issues raised by suppliers and industry over time and not only attempts to redefine how the issues fit into the wider landscape but also attaches economic, psychological and behavioural rationales as to why cultural changes have not taken place. For example:

- There are assumptions that clients are able to influence the behaviour of a rapidly expanding client base where resourcing such activity would be impossible.
- It is often ignored that companies will always strive to maximise profits. As such mechanisms and policies that go against such behaviour are unlikely to result in much change.
- Cash flow and a pipeline are very important, even successful businesses can fail if their cash flow is insufficient to cover its operations.
- Clients have budgets and strive to maximise their output given available resources. If there is no extra money it doesn't matter how much cheaper a project would be over the long term if you can't finance it up front.
- There is a mismatch between education and skills development in the private sector with no clear priorities or mechanism to fund or ensure that the skills required are developed.

Whilst this report does not go so far as to identify solutions in the areas it has identified (skills, pricing, insurance, risk, strategic investment need, outcomes and devolution) it does for the first time attempt to establish a detailed reference point for the procurement landscape as a whole. This should, therefore, allow further research to be undertaken to ensure that the procurement debate can move forward, on a basis that all parties involved can agree to.

This research will need to be based on creating practical and co-ordinated solutions given the actual behaviours and economic reality of the conditions both clients and the supply chain faces to reduce inefficiency and improve performance of procurement within construction. As such, the next steps section outlines ACE's thoughts on where more immediate research is required and this procurement series will need to progress going forward.

NEXT STEPS...

This report has outlined some of the conditions and issues surrounding the current procurement debate. What is more important, however, is how progress is made going forward. As has been discussed given the complexity and scale of the procurement landscape it would not be practical to address all the issues raised in one attempt.

As such, ACE suggests that the following work streams will be its focus going forward. These work streams will relate both directly to this report, or be part of a wider reaching topic where a dedicated piece of research is required.

Outline of further research:

- Further information and understanding is needed on the governance, function and practices of the public sector client across the UK.
- There needs to be a better understanding by all parties of how In particular, through early market engagement strategies where clients can inform the market of decision-making on investment decisions and business case development processes.
- There needs to be some work on the potential impact of devolution and its potential implications for procurement and efficiency. To create wider market opportunities and efficiencies through collaboration across combined authorities which are likely to support local economies including, SMEs, training and employment.
- A much wider piece of work on education and skills needs to be undertaken. Potentially rebalancing how clients and the construction industry approach apprenticeships, education and training.
- Economic understanding needs to be improved around the areas of developing collaboration between client organisations and industry and what affect such models actually have on pricing and bargaining power.

THE ROLE OF THE PUBLIC SECTOR CONSTRUCTION CLIENT

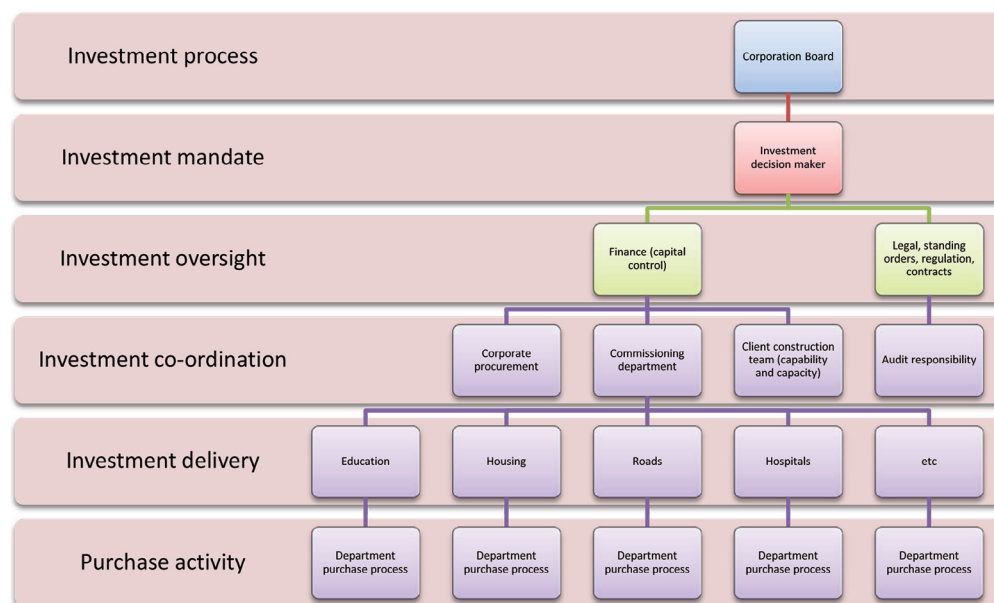
The background of the page is a vibrant green with several overlapping, semi-transparent curved shapes in various shades of green and yellow-green, creating a dynamic, layered effect.

There are many factors that influence the procurement method and strategy of an organisation. Within the public sector commitments to efficiency and the buying of a product extend beyond that of a private company with the transparency and accountability to the electorate on spending also considered vital.

Another challenge in the public arena is the scale and variation of projects procured. Public sector clients procure services and activities from the construction industry across multiple disciplines and sectors including: housing, offices, schools, educational organisations, leisure projects, bridges, roads, hospitals, research centres, harbours, and corporate property.

In many cases the public sector Construction Client role actually embraces a diverse range of complex functions located within an extensive corporate organisational structure which often is ultimately accountable to an elected authority, a public corporation or board. This starkly contrasts with the frequently perceived role of the client as an isolated team or individual.

Furthermore the public sector construction client role incorporates a number of quite distinct phases of operation, skills, practices, roles and responsibilities both internally and externally, and is subject to high levels of internal and external scrutiny as a legal entity, and as well as a service provider, directly subject to public accountability and audit.



As is demonstrated from the above, even in its simplest form the client roles, structures, and functions are both more complex and diverse than any simple function description might suggest.

For example a comprehensive range of functions and duties would include some or all of the following:

- Contribution to the commissioning body's (the receiving client) business case
- Design brief and consultant advisor appointments
- Assessing procurement strategies and routes
- Managing and complying with EU and National Procurement Regulations, corporate Standing Orders and /or Procurement rules and policies.
- Selecting appropriate forms of contract

- Managing the overall procurement process
- Internal and external stakeholder engagement
- Risk management and value management
- Life cycle costing
- Preparation of technical and design briefs
- Evaluation and reporting tenders submission
- Securing all relevant internal approvals
- Project and contract management
- Project sponsorship, project and contract management
- Driving best practice construction policy outcome
- Complying with EU and National Regulations.
- Meeting political objectives that may be set
- Securing VfM, customer and user satisfaction, social and economic outcomes
- Adopting in whole or in part the implementation of public policy recommendations from central government or industry, and the ability to mobilise and manage these changes.

Given the complexity of the above client skills, structures and practices can have a negative impact on the industry's performance and its willingness to innovate. Skills within the client body need to range from those with a macro view of not only singular project outcomes but of an investment process as a whole down to the actual commissioning client. This is often driven by a mono-service outcome - e.g housing or education seeking to secure specific construction outcomes through the delivery of a construction project.

The skills required at each of these levels are not necessarily interchangeable, and as such the traditional view of a simple progression of staff from that of a mono-functional client area to the level of an overarching decision maker is challenging.

It is also important to remember that as one moves up the client's decision making chain, the "legally defined client"(corporate client) is comprised of a number of wider functions with differing responsibilities, objectives, interactions and agendas which may not be directly aligned to the construction project objectives. For example, they may be more concerned with legalistic, political or governance issues or more frequently on audit requirements, financial control, political risk, transparency, public accountability and satisfaction, etc,

The question then arises as to how a complex and diverse organisation achieves its (individual) construction client role as well as driving construction best practice. This dual-role becomes more complex, as recognised within the IUK procurement routemap¹¹ as client organisations undertake models involving JVs, partnerships, joint procurement and regional or local frameworks.

By looking at the client roles in a simplified way, there is the tendency to conclude the client needs to drive the performance of the industry, therefore shifting away from and overlooking the much more significant issue of the client being able to measure, operate efficiently and ensure it has the skills and resources required to ensure its own roles and objectives and to effectively manage its own investments.

These client roles will encompass:

- The demand and need to manage a long term investment process across a number of commissioning sectors.
- The demand and need for a project, and how this fits into the clients long term strategy to deliver its social and economic outcomes.
- The need to engage the market, electorate, suppliers to investigate and outline the business cases for all levels of the strategy.
- The ability of the client to finance, fund and manage future investment decisions and delivery.
- Own the result and outcomes of the work.
- Corporate policy framework and management structures.
- Finance, legal, equalities, audit, regulatory, social and economic needs and outcomes.
- Ensuring that macro investment decisions and micro departmental strategies and service plans are aligned.
- Investment planning and formal decision making processes
- Engaging with customers, users and stakeholders through consultations
- Meeting corporate standing orders and contract rules
- Complying with EU and UK national regulations
- Complying with corporate procurement policy
- Construction and infrastructure procurement roles and responsibilities
- Procurement route strategies such as, integrated or devolved client procurement teams and how these may vary by project whilst creating an efficient overarching investment process.
- Political leadership, structures, policy objectives, accountability to electorate - portfolio holders, procurement committee's and scrutiny panels.

All of the above, continue to demonstrate the need to not only look at the supply side of the procurement chain but also the need for a further look into the skills, bargaining power and ability and structure of the client role in effectively managing what is a complex investment process.

Given the above high level investment summary it is now important to understand how such a process fits within the complex and granular procurement landscape.

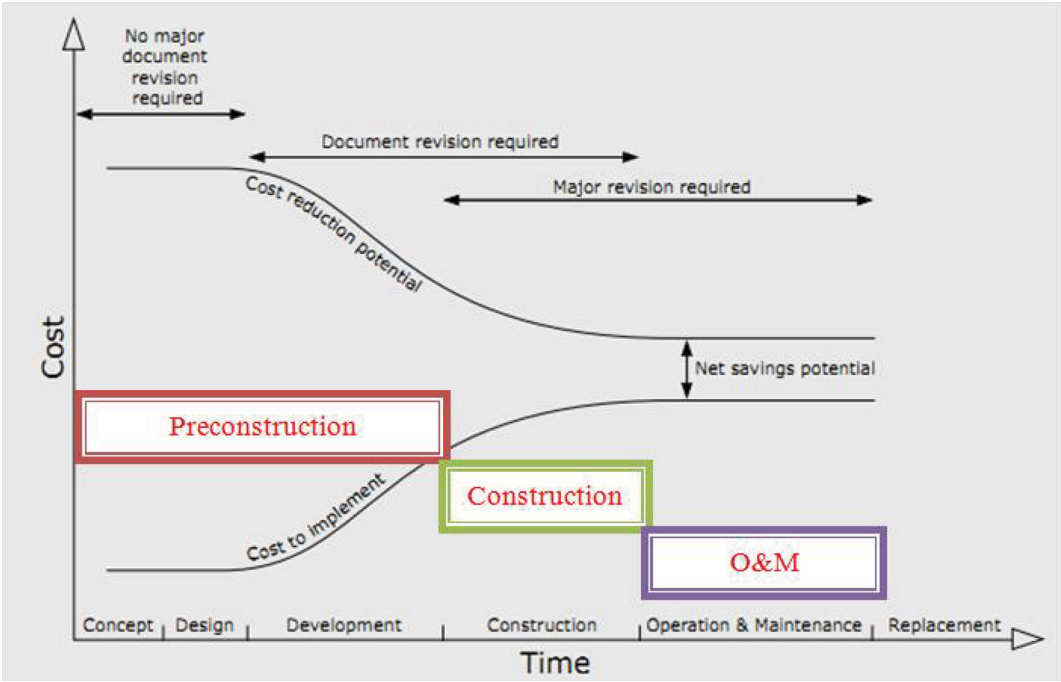
Influencing and improving procurement conditions for all parties

One of the frustrations experienced by the construction industry is the difficulty they have in translating and influencing the decisions made by clients with regards to the procurement process. This difficult has led to the procurement debate taking its current form of frustrations and little strategic shifts for improvement.

One of the reasons for this is that the complexity and scale of public procurement, the investment process, and the points at which decisions can be influenced is poorly understood.

Below is a chart that shows how projects progress through project management and, with the pre-construction phase, construction and finally operation and maintenance.

The issue is that many consider project management, contract management, risk management and procurement in a similar light. That is to say that procurement is a process of purchasing and putting in place and managing projects.



Source: Professional Project Management¹²

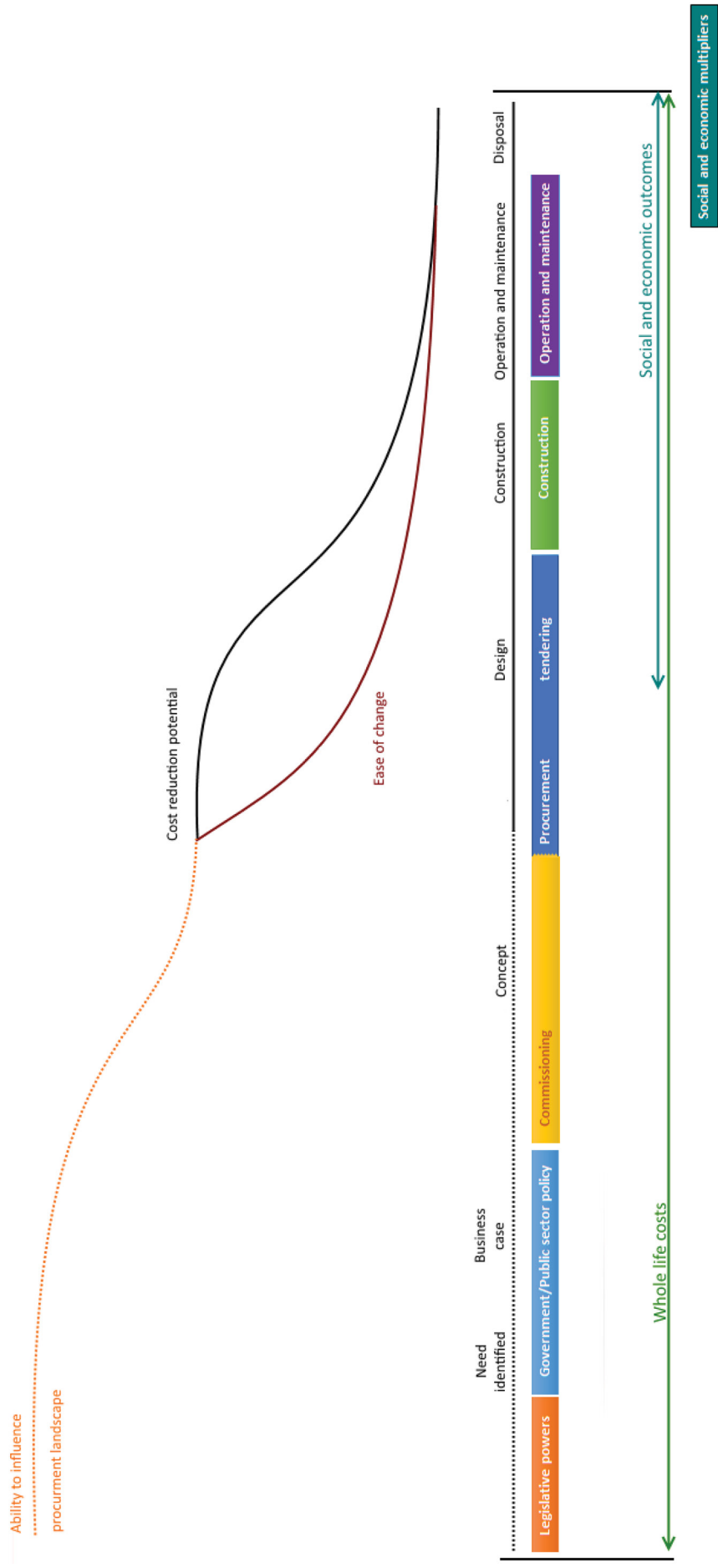
The issue is that such beliefs significantly oversimplify procurement and the public clients role within the investment process. So whilst the diagram above does not specifically relate to influencing the procurement process if you want to influence procurement you do it in the same way as a project, by making changes within the pre-construction phase of project management.

Pre-construction as considered above is, however, far too late in the process for industry to be able to consult with clients to ensure the procurement process is more efficient.

This report has therefore updated the traditional project management view of projects to one of influencing the procurement process itself and not just the design and construction phase of projects.

As can be seen from the diagram below the influencing of procurement practices starts at the point of influencing legislation. This will be both at EU and national level. Beyond this, influence has to shift to focus on the 40,000 commissioning bodies within the UK, which will each have boards and corporate requirements. As each of these stages progresses the actual amount of the procurement process that can be influenced declines.

Beyond the statutory and corporate requirements of commissioning bodies there is the ability to influence procurement within the investment process, with the formation of the investment decisions and business case development.



Once, however, you have gone beyond this stage it can be seen that procurement influence and the ease of change to conditions, falls rapidly compared to the cost reduction potential. This is because the majority of the procurement process is 'locked in' while specific project requirements and costs are more flexible.

This whole process forms the whole life cost of a project, including the social and economic outcomes achieved.

The above then would appear to actually convey a very simple message, industry and clients need to engage with each other at a more strategic level earlier within the process of developing procurement models. This relationship is likely, however, to be non contractual in its nature.

It is again, however, not that simple. With so many commissioning bodies it is hard for a company to engage on such a wide basis. There is also the issue of the exact engagement point.

It is changing such processes that is important but with each party in the chain having an incomplete picture of the process the likelihood of effective change is limited. This has resulted in a situation that was highlighted in the Rethinking Construction research:

- "As our survey revealed, when people think about the benefits of Rethinking Construction, they think about process change. Yet slavishly following a process will not produce the desired outcome unless people genuinely understand how their input contributes to the ultimate goal. This only comes from strong leadership."¹³

As such, this report will now undertake a comprehensive mapping of the public procurement landscape to develop a more detailed understanding of the interaction between clients, suppliers, stakeholders etc.

The procurement landscape

Having discussed the procurement landscape this research has put together a comprehensive map of the procurement process.

As can be seen on the last foldout page of this report, this process aligns with the categories mentioned previously and includes government's recent complexity and capability assessment concepts. This diagram forms the basis of the investment process, from its conception to completion when assets are retired.

Working from the top right of the diagram one can see how EU and national regulations feed into and through, not only central government departments, but also within the other estimated 40,000 commissioning bodies within the UK.

These bodies will each have their own decision making structures and management teams which may or may not engage with suppliers at this early stage.

This process then feeds into the need for projects, which again may have supply chain involvement in feasibility studies etc, which then inform and help to build the business case for investment. Following this, the project and programme complexity will be further reviewed and governance arrangements formed, bringing together the regulatory, legal and policy influences within the formation of the procurement process. It is important to note that some of these influences and policies may be discretionary, whereas others will be set by legislation, standing orders or corporate policy which would have been decided at the decision making level.

This leads to the formation of a procurement route and delivery model, and ultimately the basis of the procurement strategy. It is at this point that the clients will actively go to the market and 'purchase' the product they require, through the official procurement and tendering requirements. This will include OJEU, EOI, tender process and compliance.

This is where a significant transfer of time and resource takes place with the emphasis now placed on the industry to respond. As can be seen from the diagram below the industry response occurs with many feedback and response loops within the tendering and procurement process.

It is at this stage that the supply chain has to take a decision as to whether they believe the project will proceed or not, develop a business development team and engage with the client. Following this it will start to put in place project teams and formulate response for the pre-qualification questionnaire (PQQ) stage of the process.

Assuming this stage is passed, resource is then put into completing the tender for the project which will include information on the following stages identified previously:

- Compliance with legislation
- Pricing
- Governance arrangements and client specific required outputs
- Procurement strategy development
- Delivery model
- Local and regional policy
- Complete CVs and experience of staff
- Complete references from previous clients

Such an undertaking is significant in terms of time and resource and occurs across multiple bidders. This cost ultimately feeds back into the fees losing bidders charge on other projects. These costs are not only levied on industry as clients also have to account for the cost of procuring, tendering appointing bidders etc. Failed procurement costs, therefore, also have to be absorbed and accounted for on the client side.

It should, however, be noted that whilst there is sometimes a view that clients do not understand the time and effort such items take, the development and decisions to undertake such activities are all mirrored within the activities of the client. There is no process which the supplier undertakes which is not present within the client's investment plans. Such an understanding of concurrent processes is often overlooked by all parties involved.

This is the key point for ensuring future efficiency and generating savings. Parties helping each other in a more productive manner would benefit everyone. It is, however, generally forgotten that the client's skill and ability to define this process comes well before the actual buying of the project which is currently where industry spends most of its time trying to enact change.

Once a successful supplier(s) are approved the process either feeds back to procurement stages for frameworks or enters the delivery or project undertaken stage. It is at this point that project management becomes vitally important.

While some clients end the process here, there are, however, important stages which are increasingly being considered. These are the operational stage of the project including its

cost implications and investability and the spread of best practice and lessons learned

These stages are becoming increasingly important with public budgets likely to be constrained for a number of years ahead, with an additional drive to improve social and economic outcomes from investments. As will be discussed later in this report the PFI data available from the public sector show clearly that the clients who procured more often and so built up expertise delivered the best value for money not only upfront but also over the long term.

There is a significant degree of variation between governments departments, with a large variation in the amount paid back in unitary payments over time for each pound of private investment. For example:

- Ministry of Justice - £1 capital to £11.53 paid in unitary payments.
- Department for Communities and Local Government - £1 capital - £2.69 unitary payments
- Department for Culture, Media and Sport - £1 capital - £2.83 unitary payments

There is also evidence in the figures that long term payments are lower as the number of projects procured by each department increase. Such performance improvements are also backed up with evidence from other studies such as:

- "It tends to be the case that where organisations are repeat customers they approach the industry in a strategic way and secure a better outcome, particularly in the context of whole life value – and generally through the early engagement of key suppliers from across the supply chain."¹⁴
- So which sectors have shown improvement and how have they achieved it? Inevitably, it has tended to be the major clients with repeat construction business who have developed in-house 'intelligent client' teams.¹⁵

To summarise this report has so far outlined a procurement landscape which is not a simple view focusing on project delivery, it instead describes an investment process that is undertaken by clients and commissioning bodies, using the expertise of the supply chain to build and possibly maintain assets through to their eventual retirement.

Developing such an understanding of the landscape is vital if industry and clients are to shift the procurement debate to its next level.

DEVELOPING, EMBEDDING AND MEASURING SKILLS

This report will now explore in more detail the concept behind a 'skills mismatch'. It is important to note that when we discuss skills it is in respect of those required across the whole organisation to define, develop and implement an investment strategy.

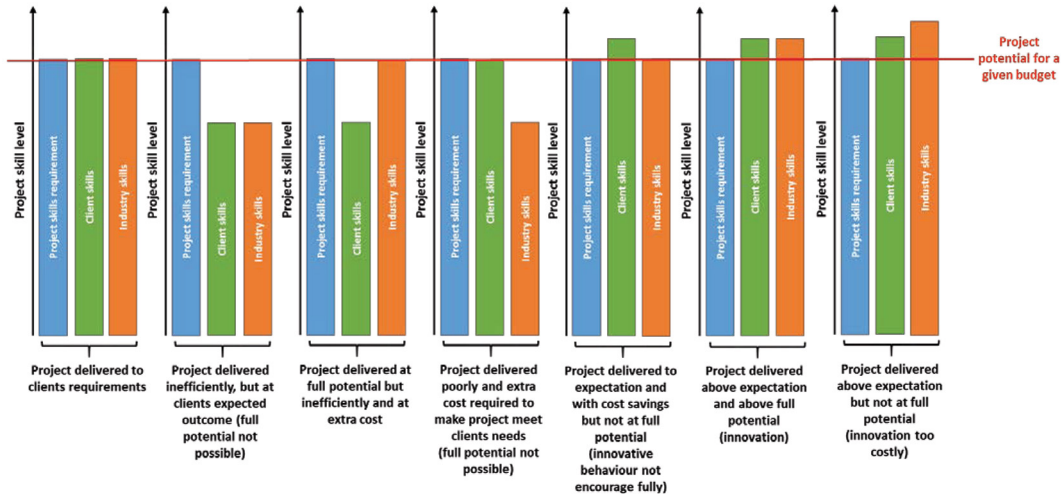
Just improving skills at the project level will not solve this mismatch if an investment strategy is flawed from the start and efficient outcome will remain impossible.

Experience and skill gap

Procurement like any other well managed strategy is reliant on the skills available. There is a large variation in procurement methodologies from traditional through to a fully collaborative approach. The same skills structures are not required to deliver each of these approaches.

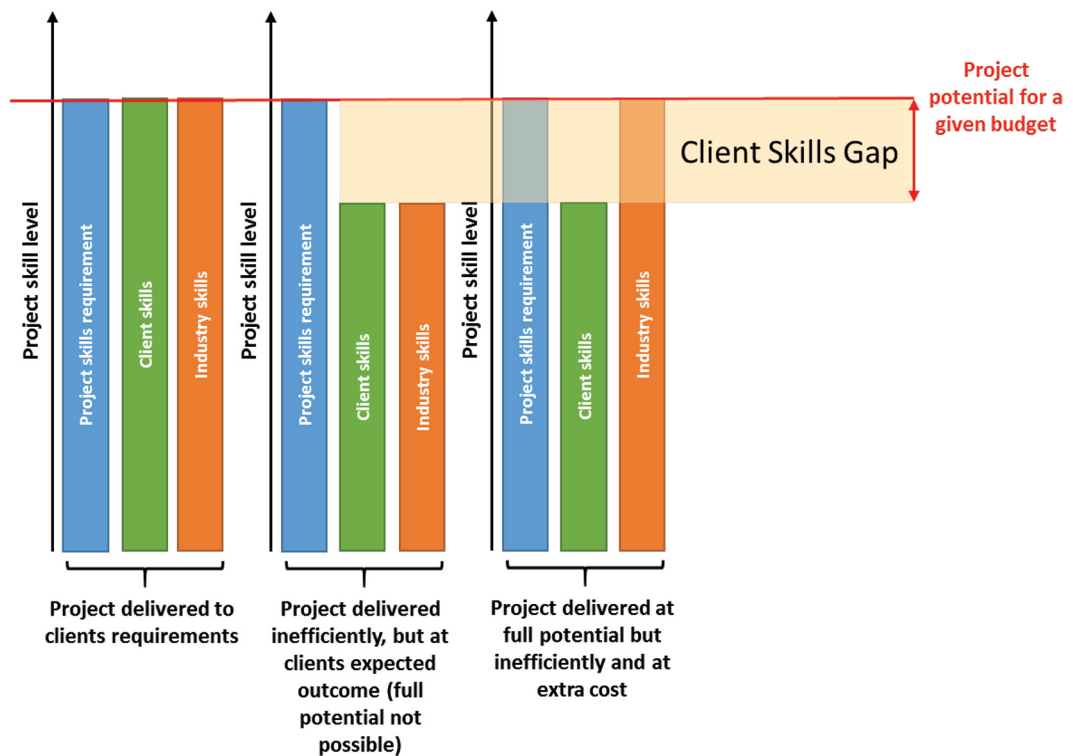
In addition, there is generally a lack of appreciation for the relevance of skills and management structures to ensure that government gets the most out of its investments.

The diagram below shows various scenarios where the project skills requirement, client skills and industry skills (where purchased by the client) vary. These scenarios vary in the following ways; clients skills being below that required to procure an effective project; industries skills being below that required to deliver a project; both industry and the client being under skilled and/or one or both exceeding the projects skill requirement.



Understanding the client capacity/skills gap

The first scenario is that of a client skill gap. This is shown more clearly in the diagram below, where the client's skills are below that of the project requirement and so therefore the investment is delivered inefficiently.



It is important to stress that this does not mean the project is inadequately managed. A project can be delivered well, but due to a lack of skills within the client, a better outcome was not achieved.

For example, the project could have been delivered successfully but due to a lack of knowledge uses 10% more electricity over its lifetime than would otherwise have been the case if the client had been better informed.

Whilst this loss in efficiency does not appear to be significant if you consider that the government spent £694bn in 2012¹⁶ and even a 1% saving would equate to approximately £7bn.

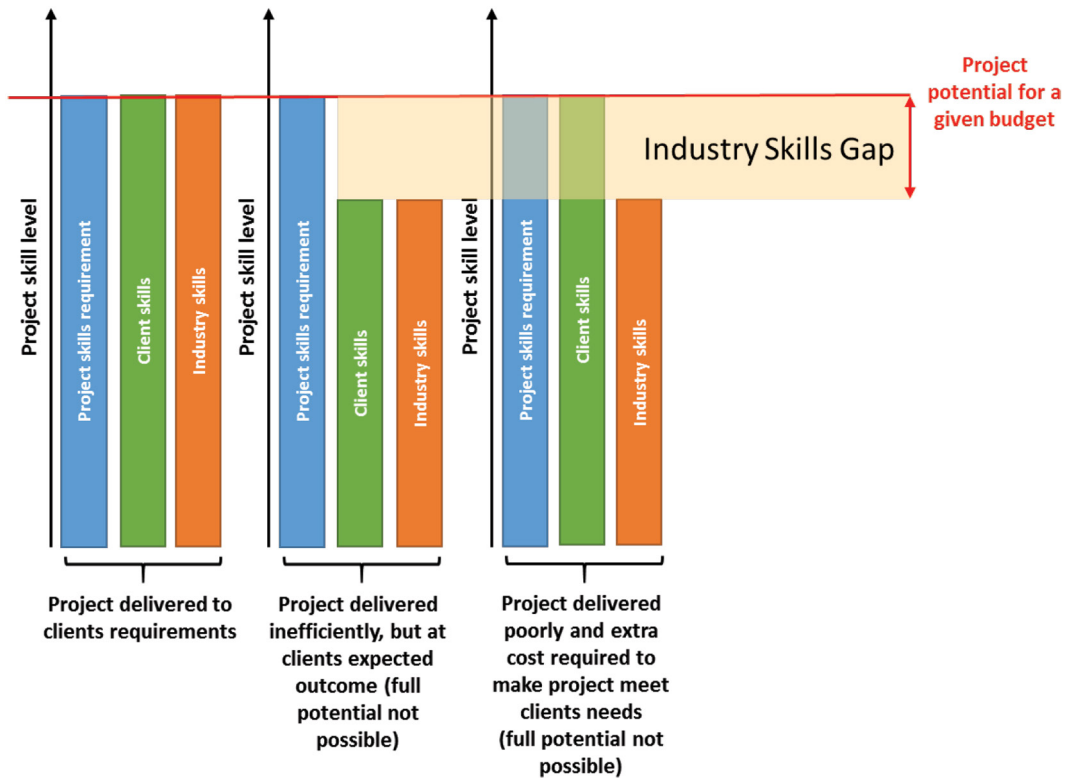
Understanding the industry capacity/skills gap

Another possibility is having an industry skills gap. Under this scenario whilst the client has the ability to invest and procure efficiently given the funds that are available, industry is unable to meet the requirement.

Some would argue that this scenario is unlikely as a competitive industry will generally match the requirements of a client or would not be awarded the contract.

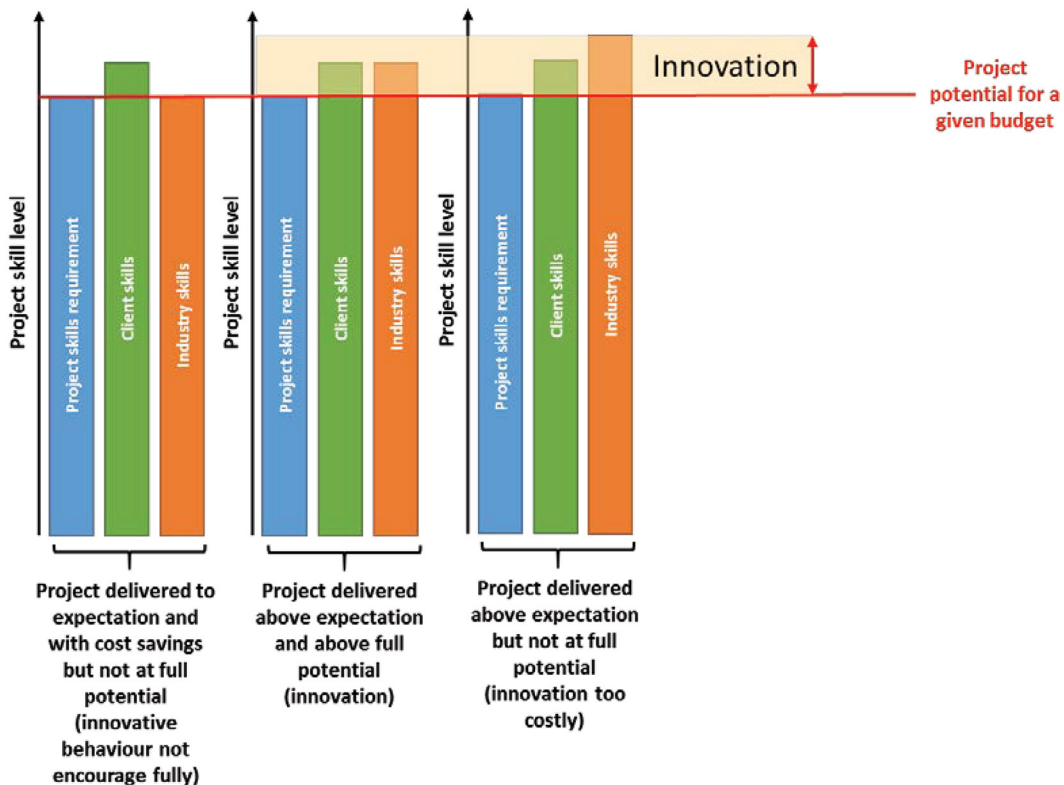
Nethertheless, this situation may arise, however, happen for a number of reasons including a skills shortage within the industry, a lack of bidders within the procurement process, an inability to get the required products for project delivery and a difference between the vision and priorities of the client and the supply chain.

Again this has been shown graphically below:



Understanding genuine innovation

The final scenarios are ones where genuine innovation occurs. That is to say that for a given budget where the expectation is set industry and the client together are able to deliver a project which exceeds expectations given the skills of the team. Again this has been shown graphically below:



The interesting thing to note is that in all of the above scenarios, whilst the ability to deliver a project can be constrained by industry, the actual ability to deliver a project is dependent on the client's skills. That is to say that the client's skills are a definitive constraint and it is not able to deliver above its capacity or skill level.

This may seem controversial, and many will say that working collaboratively industry could bolster the client. This does, however, rely on the client identifying this higher skill level and allowing activity and innovation to occur in a way which ensures the project outperforms their own skill level.

Whereas, if a client does not fully understand the working practices and improvements industry can offer and continues to procure and develop a project to the best of its ability and not industries, it therefore is constraining the outcome.

The above has significant implications for the procurement landscape and will change the nature of the conversation industry needs to have with government on improving the outcome of its investments through the procurement process.

Whilst this report discusses skills in their entirety, government has started to make some progress in developing a common methodology for assessing a client's skill capacity to implement specific procurement mechanisms. This is especially important given the UK's investment needs going forward.

The procurement routemap – a significant step towards realising the role of the client as an investor within infrastructure

The government has started to provide further clarity on infrastructure investment through the National Infrastructure Plan (NIP), but has also recognised the importance of getting the procurement process right as part of the investment decision process.

As such, Infrastructure UK (IUK) and HM Treasury have worked with the Cabinet Office and the Department for Business Innovation and Skills (BIS) to further develop a structured strategic approach as to how government should approach investment decisions within the context of its procurement methods.

The Infrastructure Procurement Routemap begins by outlining quite clearly that making this process efficient involves looking at it in its entirety.

- “Changing procurement behaviours, removing inefficiency and improving strategic collaboration with the supply chain are central themes of the Implementation Plan. The Government has already taken steps to cut significant waste and inefficiency in its own procurement processes. This is just the beginning.”¹⁷

This initially sounds like so many other reports with the emphasis on everyone coming together to produce an optimum outcome, it does however, clarify stating that the document is:

- “Aimed primarily at the sponsor and client organisations that deliver major projects and programmes, long term capital investment plans and publicly procured mega-projects.”¹⁸

This very much feeds into the theory this report has outlined, that the skills set of the client is the default backstop for project deliverability and performance.

The procurement routemap goes on to discuss how procurement processes remain too long, expensive, adversarial and risk averse. Yet as we will discuss in this report further work is needed to change the rhetoric around this debate.

For too long this rhetoric has assumed an ‘idealistic’ world where co-operation and willingness for a good outcome are considered enough to produce one. Previous studies have made limited attempts to discuss behaviours and conclude how these affect the ability to drive change, and therefore move the debate forward.


The procurement routemap does, however, start to discuss some of these aspects linking behaviours to efficiency in more detail.

- “Client capability is critical to achieving success in procurement particularly when using more sophisticated procurement models.”¹⁹
- Clients are often also challenged by a legacy and lack of trust when adopting more integrated approaches, such as alliancing.”²⁰

Within the routemaps is a methodology for the assessment of a client which links to the complexity of the overall procurement function. For example: people, organisational culture, goals and practices, together with technology and procedures, strategic guidance, ownership, viability asset management.

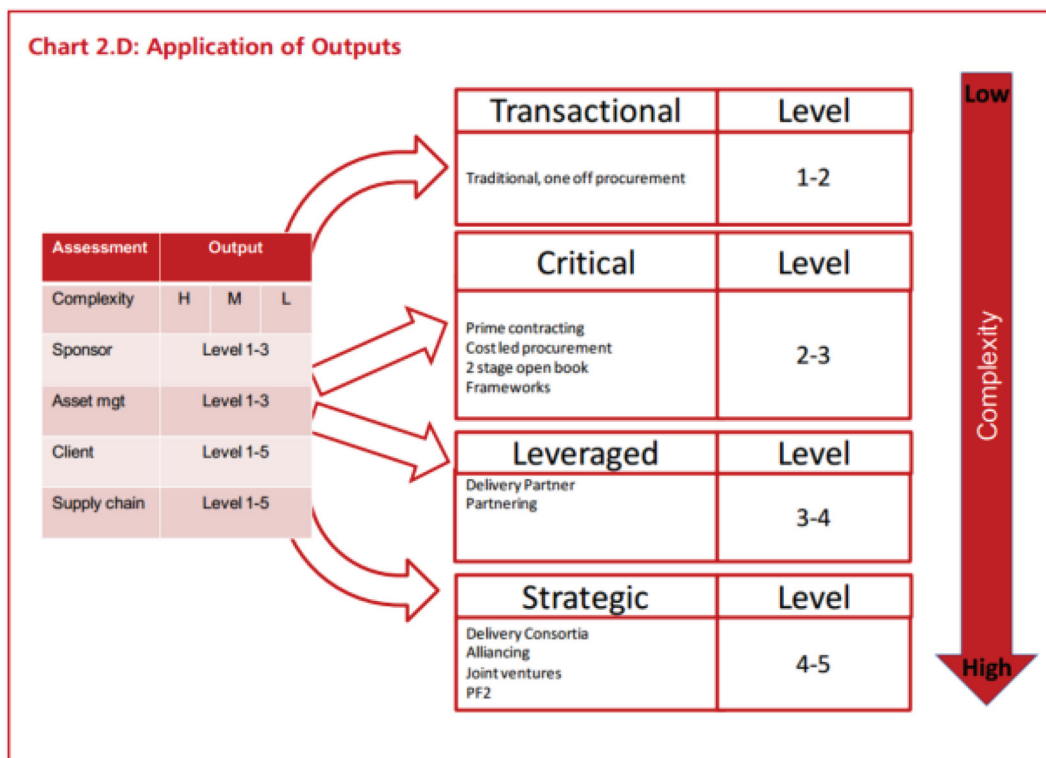
This routemap also outlines what it considers to be key descriptions of the capabilities of ‘intelligent’ client organisation.

Table 2.A: Client & Supply Chain capability descriptions based on “Intelligent Client” principles

Level 1 – Initial system	Level 2 – Uses processes and procedures	Level 3 – Effectively governed	Level 4 – A managed system	Level 5 - Optimised system focused on outcomes
High degree of inefficiency as a result of informal governance arrangements structured around simple transactional relationships with poorly defined or over prescribed requirements and little or no investment in performance improvement and capability development.	Clearer and repeatable, yet incomplete implementation of business management tools with a greater understanding of performance and improving value but evaluation is in terms of objectives not outcomes.	An organised and coherent process that recognises discrete elements at the strategic level. As a result there is greater consistency in decision making, challenge of requirements, a greater flexibility to market change and clear roles and responsibilities related to performance targets.	Policies are developed in accordance with complex outcomes such as future proofing, carbon reduction and whole life costing. New standards for performance are established based on win/win scenarios and a commitment to sector or industry development.	An adaptive and sustained system focused on learning and continuous improvement both in terms of strategy, behaviour and continuity of investment. New standards for the sector or industry are set focusing on more efficient outcomes, alignment of the interfaces for deriving maximum value and a long standing commitment to capability and capacity enhancement.
Low capability				High capability

Source: IUK, HMT

This is built on further by then relating the capability of the client to various existing procurement methodologies. This attempts to match a client’s skills base to the method of procurement for which it is most suited to undertake.



Source: IUK, HMT

The procurement routemap starts to demonstrate attempts to co-ordinate government work streams and various initiatives.

For example:

- Tools are being developed jointly between the Infrastructure Cost Review and Government Construction Strategy (GCS).
- From January 2012, LEAN sourcing principles were adopted across central government. The Cabinet Office is supporting these principles by publishing Standard Operating Procedures (SOPs) for Open, Restricted and Competitive Dialogue procedures.
- In conjunction with the British Standards Institute and Industry, BIS has developed PAS 91 the Publically Available Specification for Construction Related Pre-Qualification.
- Utilising and learning from the Programme and Project Management Maturity Model (P3M3) developed and owned by the Cabinet Office. The refreshed P3M3 guidance will also be updated to reflect lessons from the IUK routemap.

As with other reports the emphasis of early engagement is highlighted, specifically in relation to early consultant-contractor engagement. The routemap in particular found a number of best practice features, summarised below:

- Engagement is implemented early at the point of maximum influence, ideally whilst the solution is still in the initial stages of development.
- Allowing a sufficient duration to develop alternative solutions.
- Prequalification and tender selection criteria that reflect the wider supply chain.
- Tender processes that comply with procurement law but do not adopt overly cautious strategies.
- Flexible payment and contract terms and recognition of Intellectual Property

- A structured and client led engagement strategy.
- Utilises incentive strategies that reward all levels of the supply chain.

This report, however, suggests that early consultant-contractor engagement alone is insufficient to ensure effective project delivery. In the absence of an overarching and strategic investment vision whilst individual projects may be successful the social and economic outcomes of a number of projects as a whole will not reach its full potential.

As is discussed in the procurement landscape section of this report the investment and commissioning process starts long before a client engages in buying a solution.

Again behaviours and language are important here, with the routemap for example suggesting that:

- “Strategic Incentivisation may be used where there is a greater business risk to the client in the construction supply chain failing to meet the required objectives. By offering improved reward (over and above a typical fee), the client encourages the supply chain to “buy in” to its business objectives in order to jointly manage the risk and increase the chances of success.”²¹

Why, however, is it being suggested that incentivisation can only be utilised where there is greater business risk? Why, for example, could it not be used to improve the efficiency of what is built and thereafter the outcome? Whilst there may still be risks associated with such changes, by focusing purely on risk as the key driver for any incentive mechanism government is encouraging the supply chain to add a significant risk premium. This is because the focus is on future possible problems and not the benefits, innovation, and potential commercial advantage of the solution.

Incentives are, however, part of a much wider discussion with the supply chain commenting that margins are currently at unsustainable levels. As one would therefore expect there is significant interest from industry in comments within the procurement routemap such as:

- “This includes fundamental issues such as how first tier suppliers are presently rewarded and how they can be moved from traditional fee based contracting to margin enhancing strategic incentivisation.”²²

One must ask how realistic is the goal of moving towards ‘margin enhancing strategic incentivisation’. Whilst both the supply chain and industry would both accept that if margins are so low they are unsustainable this is bad for long term growth prospects. There needs to be a significant discussion as to what in the public and industry are willing to accept and undertake as a cost and reasonable return over the long term to secure economic growth.

To give an example the PFI programme was criticised for the apparently excessive returns it generated. Yet many of the returns on scheme were made by flipping projects, or due to a lack of procurement experience and poor negotiation. PFI was supposed to balance long term costs against reasonable return. Given all that was learnt through this process and in the reform of PFI to PF2 such lessons should be able to play a greater role in the learning curve that can be applied to a procurement strategy.

The procurement routemap has certainly helped move the debate, but reform will be a long road, with significant work needed to harmonise and grow shared client behaviour and systems from the bottom up.

This is where significant savings are still available to be made. For such change to occur the lessons learnt across all departments, with many suppliers needs to be communicated but more importantly engrained within client thinking.

For this to happen, however, the fundamental issue of the construction sectors business models being driven by short term measures such as, turnover, order book, margins, cash etc. needs to evolve towards the longer term measures required by clients. This will become increasingly important as clients shift towards long term relationships/partnering with increased focus on innovation, R&D, wider social and economic benefits etc.

The important link between skills and bargaining power

Bargaining power is an important part of the process of buying and selling within a competitive market. In theory, if all parties have perfect information, price formation is efficient, entry in and out of the market is open, and no one party has influence over the other or the process of price formation.

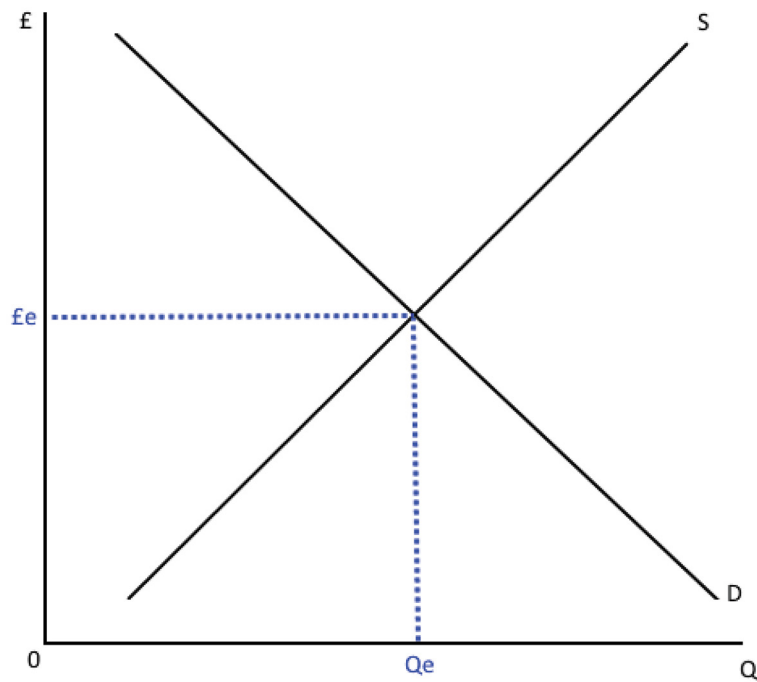
This, however, is not the case in reality, with a number of factors influencing the bargaining process. For example:

- The client and supply chains size and mass is generally mismatched, with one being more powerful than the other.
- The legal system, legislation and contractual agreements all affect shift bargaining power. For example, if clients were to procure a greater percentage of all jobs from SMEs this instantly expands the potential work pool for SMEs giving them greater ability to choose the jobs they undertake, reducing their reliance on a single client, and thus increasing their bargaining power.
- Clients and suppliers have different sectorial exposure. As such, they can gain or lose bargaining power at different times. For example, if a company's work is mainly in water and this sector starts to struggle and a decision is made to break into a new market, that supplier does so at a disadvantage to competitors with greater experience and is likely to respond with an aggressive bid (in terms of price and quality) to offset this disadvantage. The suppliers bargaining power has thus been reduced, while the client now can leverage off of such activity to increase its bargaining power.
- As identified previously the client and supplier will have different skill levels. This therefore instantly places one party at a disadvantage in negotiations and so reducing their bargaining power.
- The assumption about parties having equal or perfect knowledge is simply untrue. Each will have different experience, access to different data and no one has knowledge of pricing and solutions right down the supply chain, especially given the complexity of the supply chain in construction.

The above demonstrates how pricing is determined in reality via a competitive system of interactions between supply and demand (from the top to the bottom of the supply chain) and as such is unlikely to result in the most efficient (equilibrium) outcome on every occasion.

In a perfect market the outcome that should occur is shown below, where the price (£e) and quantity (Qe) is determined by the point where supply and demand meet.

Efficient outcome from market mechanism

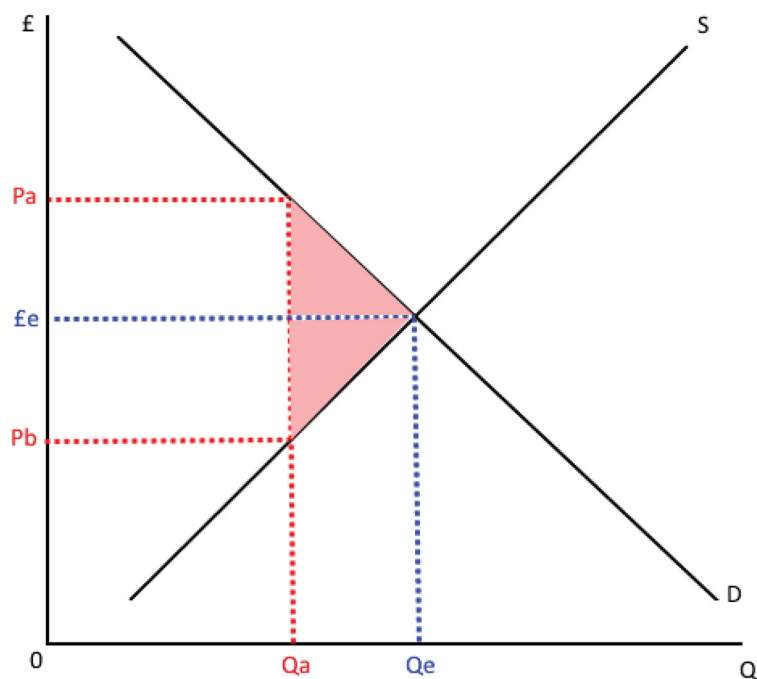


What is more likely to occur in construction procurement due to the factors previously discussed is an inefficient outcome.

For example, if the client's skill level is limited and results in an outcome whereby they do not realise the full benefit of a project as an investment. The outcome below occurs, where the price paid (P_a) is above that of the equilibrium ($£e$) with a lower output level (or outcome) of Q_a (compared to the efficient market output of Q_e).

This means that the shaded red area (as shown below) is a loss of economic performance (in terms of pricing and output) which, under perfect market conditions would not have occurred.

Loss from inefficient procurement

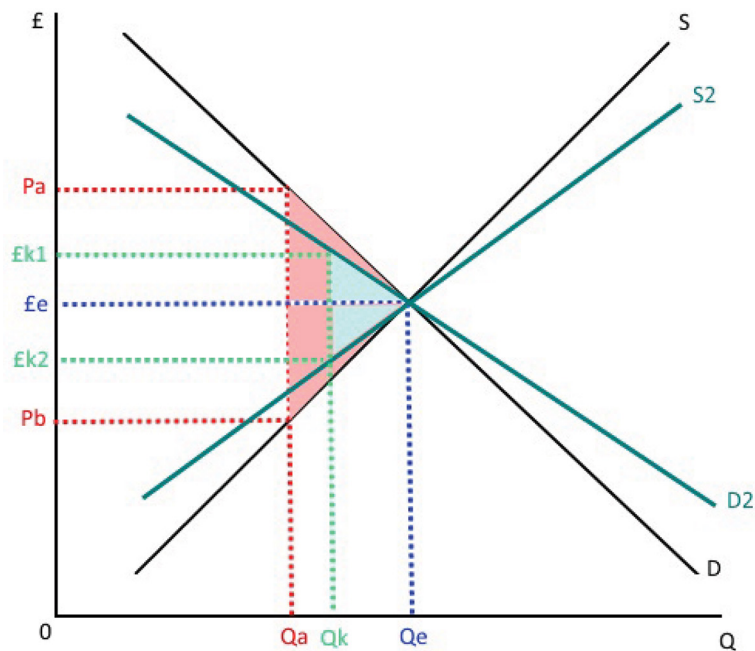


Given the varying levels of skills of clients, a lack of perfect information etc government will never reach the point where every project hits the most efficient equilibrium point. There will, however, be a range of positions from which clients procure.

The elasticity of the lines also makes a difference to the scale of any efficiency loss. For example, demand is more elastic (responsive) when aspects such as the number of substitutes and amount of competition rises or time period is increased occurs. Supply also can be more elastic for example as spare capacity increases.

So, if we assume that a client's ability to procure improves, and better competitive tendering is encouraged increasing the elasticity's then the outcome below occurs where the client is now able to procure at price $\pounds k1$ which is an improvement on P_a and at a higher level of output Q_k as opposed to Q_a . They are also, therefore, closer to the most efficient outcome a perfect market could provide.

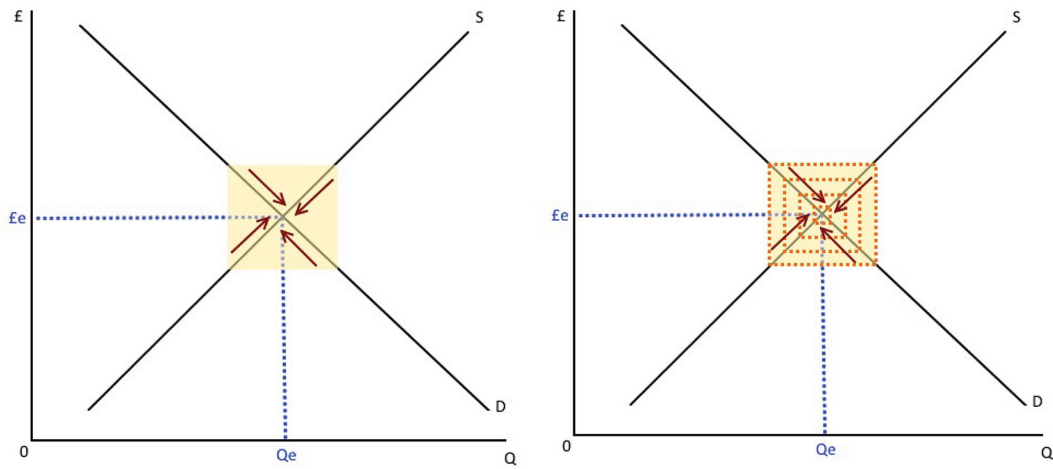
Reducing the procurement loss



What is also interesting is that the area of efficiency loss (green) is not only reduced by moving towards the efficient equilibrium rate but its scale is also reduced by increasing the elasticity of the curves.

Given that it is impossible for public clients to procure every project at the most efficient equilibrium rate due to constraints such as skills, etc, what government must aim for is procuring projects within an acceptable margin of the efficient market level. This is shown below by the yellow box on the diagram.

Vital to this, however, will be the willingness of government and clients to improve their performance and so drive towards the efficient market rate.



This is where work such as that of IUK's procurement routemap²³, recognising the stages of procurement, their complexity and potential to improve efficiency is important.

As can be seen in the right hand diagram as a client moves from transactional to strategic buying they should be able to shift towards the efficient market outcome, reducing economic inefficiency, balancing price and output within the investment process.

THE SUPPLY CHAIN AND ITS INTERACTION WITH PROCURING AUTHORITIES

One of the issues faced when discussing procurement is untangling the complex web of interactions between clients and the various tiers of the supply chain (where engagement reduces significantly as you move down the supply chain) and the points at which they are involved within the process.

As has been shown in this report, this interaction is not only complex in nature but has also probably been underestimated and underappreciated by all parties in terms of actions that will have a reasonable chance to influence and drive the process of change management.

It is important to recognise that this programme of change management within procurement is not new. Clients and industry have continued to work together to improve and procure items in the way they feel is most efficient at that point in time.

What is lacking, however, is a fuller understanding of how these processes align, how clients communicate information and needs, how clients come to the decide on these needs, tools and approaches to achieve these needs, the balance of cost and responsibility to deliver these needs, the impact on suppliers, and how this is balanced against the ultimate goal of both the single client and across the public sector as a whole.

Broad coverage of industry's perception of the public sector construction client

Within the construction sector there is a tendency to see what the client can do to improve the project and industry's needs. Within this, however, it is generally overlooked that the client is ultimately doing what they must to ensure that the project meets their own objectives, some of which may not have been communicated to industry on a singular project.

Industry usually defines the client role as follows:

- Deciding the procurement strategy and procurement route.
- Developing the brief
- Deciding the contract form
- Appointing the supply chain (unless undertaken by a contractor directly)
- Monitoring progress
- Paying for the work

The above, however, often forgets the commissioning and business case process (the pre-project process), including feasibility studies, financial approval, funding, resident and other consultations, controls and approvals, discussions with government, general public consultations, approval process, governance, internal reports and the need for formal reporting to executives and cabinets and committees.

All of the above activity takes place against a backdrop of significant need to ensure compliance with wide ranging organisational policy requirement, including corporate procurement policy (PII, Standing Orders, Contract Rules, EU regulations, corporate procurement rules etc) all of which are in place to ensure taxpayers money is accountable.

This is why despite inefficiencies and issues identified by the supply chain and as part of many previous studies, the negative impact of a fragmented and inefficient investment decision making process is still impacting on the procurement debate.

What findings have we identified and to what extent has change occurred?

To demonstrate what findings have been identified and the extent of progress over time this report will explore studies such as:

- Supply Chain Analysis into the Construction Industry – A report for the Construction Industrial Strategy (BIS)
- Industrial Strategy: government and industry partnership, Construction 2025 (BIS)
- Construction Taskforce, Rethinking Construction (LGTF)
- Never Waste a Good Crisis - A Review of Progress since Rethinking Construction and Thoughts for Our Future (Constructing Excellence)

This section of the report will explore the issues raised by suppliers and industry over time and not only attempt to redefine how the issues fit into the wider landscape but also attach economic, psychological and behavioural rationales as to why behavioural changes have not taken place.

The failure to recognise individual behaviours is evident in the lack of progress in procurement reform. For example:

- “Too often the commitment is skin-deep. Scratch beneath the surface and you find many so-called partners still seek to avoid or exploit risk to maximise their own profits, rather than find ways to share risk and collaborate genuinely so that all can profit.”²⁴

This demonstrates that reform will not occur unless they take into account individual behaviours and how these interact with the market, and do not just assume that companies will work for some ‘greater outcome’ where each entities’ benefits are not maximised and risks reduced.

Project specification

Project requirements (outcomes) within the procurement process are some of the most important communicative tools for suppliers. This process is intrinsically linked to pricing, risk complexity and innovation and, therefore, has a significant effect on the outcome, management and delivery of a project.

The industry does not, however, always help itself when considering project specifications and priorities. For example:

- “A quality driven agenda: Quality means not only zero defects but right first time, delivery on time and to budget, innovating for the benefit of the client and stripping out waste, whether it be in design, materials or construction on site. It also means after-sales care and reduced cost in use. Quality means the total package - exceeding customer expectations and providing real service.”²⁵

There are a number of issues raised by this statement. Firstly having a zero defect target for a complex project is unrealistic. Clients and the supply chain all aim to reduce defects as they cost additional money. As such, what is needed is to focus on the cause of defects in the first place not just the defects themselves.

Secondly, the above makes little of the relationship between quality, pricing, customer service, defects and innovation. The term ‘a quality driven agenda’ implies that it must be achieved no matter what the cost. Yet as the industry achieves higher and higher levels of quality there is little or no appreciation that the additional cost of hitting the next milestone increases.

Industry therefore needs to better recognise that clients have to balance these wants against a limited (constrained) budget and their own skills to procure their long term investment requirements. As such, the agenda is not 'a quality driven agenda' but an 'optimal performance given allocated resources' agenda.

Another suggestion for improving project performance is to shift towards more standardised outputs. For example in 1998 it was suggested:

- "Standardisation also has an important role to play in improving the design stage of construction. The average car contains about 3,000 components. A house, by comparison, has about 40,000. We see a useful way of dealing more efficiently with the complexity of construction is to make greater use of standardised components."²⁶

Whilst the premise behind this is correct the manner and language used by the construction sector does not encourage such behaviour. Given the scale of this issue across various projects and thousands of clients, the industry should take note of EU initiatives. The aim of industry should be to harmonise practices, components, and both procurement and regulatory approaches where beneficial.

The key here is the use of the word harmonisation, which suggests that where appropriate there may be differences, but also allows authorities to communicate and build a clear level of standards from the bottom up over time.

If the construction sector tries to force standardisation on clients it will not work. Instead government and industry need to encourage harmonisation at a grass roots level with momentum building over time. This will ultimately result in a consensus around what is correct and can be applied but significantly reduce the multitude of differing approaches that are currently taken. This would also reduce costs such as maintenance and administration.

Pricing

Pricing is obviously an important factor within procurement as it is the indication of the accumulation of all factors relating to a project for both the client and the suppliers. For this reason it is important that realistic price levels are attained by all parties involved.

This process is not a simple one, with the supply chain generally of the view that clients procure the cheapest price available and consideration for items such as whole life costs and innovation is reduced.

- "Too many clients are indiscriminating and still equate price with cost, selecting designers and constructors almost exclusively on the basis of tendered price."²⁷
- "While the leadership of public organisations may be committed to the idea of best value, their procurement teams often still want to achieve lowest price."²⁸

The recent recession has further reinforced the pressure on clients to control the cost of projects. This has wrongly shifted the debate towards one of short term price formation rather than one of ensuring that the best long term investment decisions are taken given the finance that is currently available.

What is generally misunderstood, however, is that this is purely an issue between the ultimate client and the supplier. Such practices are also common within the supply chain between the tiers of companies. For example:

- "Extensive use of cheapest price procurement, particularly at Tier 3 and below – including the use of sub-contractors from outside of frameworks to challenge the price levels of preferred suppliers. A common complaint was that the valuation of changes was left unresolved until the end of the project, when a subcontractor might be in a weaker bargaining position."²⁹

It is also important to recognise the effect supply chain costs, which ultimately feed back into their pricing decisions have on the overall cost of a project. For example:

- “Based on the results of the study, our assessment of the total proportion of a contract price that is attributable to supply chain profit margin and overhead margin is likely to be in the range of 18 to 20%.”³⁰

Over the past few decades there has been an increasing trend of clients and the supply chain working closer together on projects, forming alliances, blurring the lines between parties etc. Thus reducing the incentive for clients to procure on the basis of lowest price only, whilst increasing the involvement and sharing of risks by all parties.

This has not, however, solved these problems and given the tighter market conditions and constraints on public spending going forward, it will remain difficult to. This is for a number of reasons:

- These concepts ignore individual behaviours that take place within this pricing mechanism, and assume that a ‘combined position’ has a preferential ultimate outcome for all parties.
- Imperfect information. This flows in both directions, the client needs to be intelligent and knowledgeable enough to procure services whilst the supplier needs a clear understanding of what the client is aiming to achieve, and where its budgetary constraints are.
- It is assumed there is capacity available within the market to price at a ‘market rate’ and that the current level of capacity and workload across both the supply chain and client is available to undertake a project and price at this level.
- Risks between parties are perceived in different ways. Current practices whilst placing emphasis on the party best placed to manage risk assume that all parties are able to price and manage risk effectively.
- Prices provided by suppliers are assumed to be efficient, as they have been formulated in a market.
- Pricing is generally a short term formation of the balances of risk and reward for that period in time. (i.e. it is a short term measure). As such, pricing outcomes rarely consider the long term sustainability of the individual organisation or the industry as a whole. This includes the importance of reliable and sufficient cash flow for a business to operate.
- Long term pricing and value formation can only occur if there is a clear and a relatively low risk of changes to long term funding profiles.
- Low pricing in itself is not an issue if a task can be undertaken at a price within a business’ operations this is sustainable, however, clients need to be able to assess this

Margins

Discussion about pricing ultimately impacts on company’s margins. These margins represent the economic benefit and provide the rationale for remaining in the sector and investing in future productivity.

The construction sector is generally considered to be a low margin sector, which makes the recent challenge by government to improve efficiency a difficult one. There is concern as to how sustainable this efficiency drive will be unless real savings are found within the procurement and delivery process.

For example recent evidence suggested that:

- “Current pricing levels are unsustainable, in that price reductions have been achieved through price cutting rather than cost reduction.”³¹
- “The proportion of high margin work found on construction projects is relatively low.”³²

Such low margins are particularly an issue when you think of how the use of procurement mechanisms such as retention funds. Whilst if the client uses a retention fund of between 3% to 5% which does not sound like much, this effectively results in the supply chain working at cost only receiving its ‘profit’ until after the very end of a project providing little incentive.

Efficiency gains should not be purely at the expense of margins with the recent IUK Procurement Routemap noting that within effective delivery and procurement models:

- “This includes fundamental issues such as how first tier suppliers are presently rewarded and how they can be moved from traditional fee based contracting to margin enhancing strategic incentivisation.”³³

So whilst the construction sector has managed to operate at lower margins in recent times there is growing concern also the long term impact this is starting to have on items such as future investment, employment and training potential.

Again traditional suggestions within the procurement area have been to encourage collaboration, thus reducing inefficiency and thereby allowing suppliers to improve their margins. This again, however, is unlikely to work as it ignores several economic and behavioural factors:

- Clients are generally aware of the margins of suppliers who enter a tender process. They are not, however, despite their best intentions, going to enter into a conversation with a supplier and suggest their margins are too low. If a supplier feels they are unable to work to that margin and bases its tender on it, the client will accept the supplier has complete knowledge of their own business.
- Suppliers should account for investment, and training within their business costs and margins.
- Current assumptions preclude the possibility of companies lowering margins to enter new markets or sectors. It is important, however, for clients to assess such actions against the risk of a supplier potentially failing to deliver or going bust.

Supply chain fragmentation and working together

A number of previous studies have referred to the extent to which the supply chain is fragmented and the advantages and disadvantages of this structure.

- “On the positive side, it is likely that it has provided flexibility to deal with highly variable workloads. Economic cycles have affected the industry seriously over past decades and have meant that it has been forced to concentrate more on survival than on investing for the future.”³⁴
- “On the negative side, the extensive use of subcontracting has brought contractual relations to the fore and prevented the continuity of teams that is essential to efficient working.”³⁵

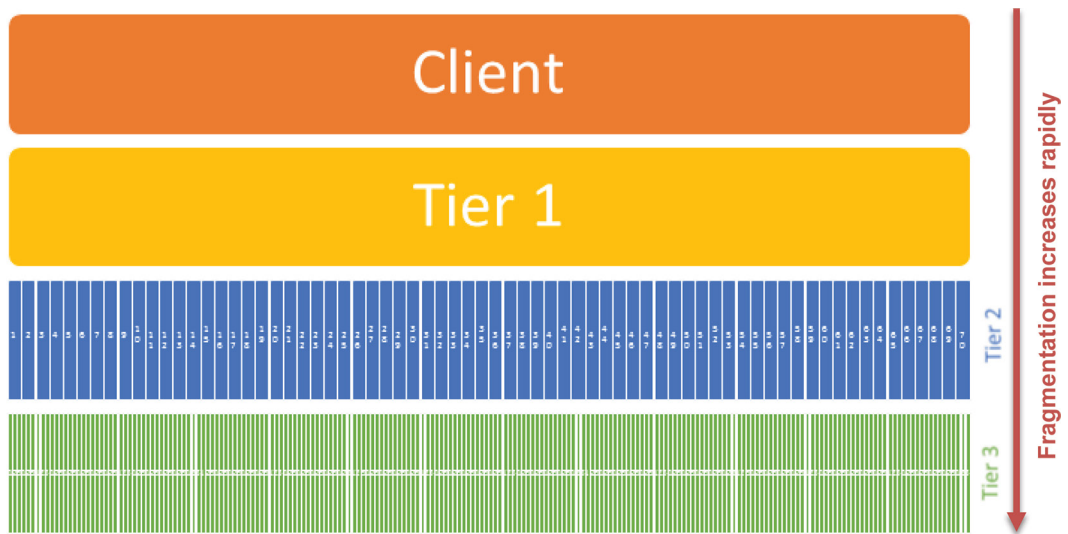
This fragmentation increases as one travels down the supply chain and a greater number of specialist providers are required to deliver individual aspects of projects.

For example, EC Harris found that:

- “All projects in the sample feature a large number of Tier 2 suppliers (that is, specialist contractors such as cladding, building services or finishes contractors). To have 50 to 70 Tier 2 suppliers and sub-contractors is not uncommon.”³⁶
- “Most construction work is delivered at the Tier 3 level or below – meaning that there are two tiers of management activity, procurement etc. above most construction activities.”³⁷

Whilst being fragmented, however, it is important to note that most of the value of projects remains within the productive capacity of the first two tiers of the supply chain.

Graphically if you represent this with three Tier 3 suppliers, under the 70 Tier 2 suppliers, you get the following diagram.



This shows how quickly the supply chain becomes fragmented and how unmanageable it would be for a client to dictate terms further down the supply chain. Even the industry has recognised how at times this fragmentation can be an issue.

- “We recognise that the fragmentation of the UK construction industry inhibits performance improvement.”³⁸

The question is how to ensure that this fragmentation does not lead to a sub optimal outcome, with outcomes not delivered or by increasing project and transaction costs. To do this there is need to ensure that lessons are passed on efficiently between individuals and companies.

Industry is hoping that collaboration through the use of Building Information Modelling (BIM) will help to address the fragmentation issue. Whilst there is no doubt that over time this will drive some improvement in integration, it does seem that again this view that such behaviour will just occur regardless of incentives or drivers. For example, implementing such practices was discussed back in 1998:

- “Improved components, materials and construction methods, including standardisation and pre-assembly, and new technology such as 3D object-oriented modelling and global positioning systems.”³⁹

Processes such as the above are never going to bring in radical change at the speed the industry wants. Primarily because the cost of implementing such technology across a business is a significant investment. As such, companies will only invest once they are sure it will give them a competitive edge or be a standard requirement of projects going forward.

Over the past 25 years, the industry has shifted towards partnering and alliances to improve knowledge sharing. Whilst this is a shift in the right direction it is generally assumed that all clients have the skills or expertise to implement such regimes. This is not always the case.

For example, the Construction Taskforce in 1998 highlighted that:

- “Partnering is, however, far from being an easy option for constructors and suppliers. There is already some evidence that it is more demanding than conventional tendering, requiring recognition of interdependence between clients and constructors, open relationships, effective measurement of performance and an ongoing commitment to improvement.”⁴⁰

More recently IUK, in conjunction with other government departments, has started to put in place a method for measuring client capability to assess if they should undertake such resource intensive procurement methods.

Another important stakeholder that needs engagement within any partnering process is the asset owner and operator, as these individuals ultimately have the greatest interest in ensuring the long term efficiency of a project.

Without this link the project will not achieve a long term view and consider whole life costs and operational efficiencies in light of the upfront capital cost. The lack of this link has also meant that the learning process of efficient operation and data for its intended performance verses actual performance is not integrated into future project learning.

The Private Finance Initiative (PFI) was one of the best attempts by government to instil such behaviours. ACE’s analysis⁴¹ into the effectiveness of the capital cost of PFI versus the operation return found that:

- There is a significant degree of variation between the performances of government departments.
- Linear analysis shows that departments vary significantly with the Department of Communities and Local Government achieving £1 capital investment for £2.69 in unitary payments over the life of the project, whereas the Ministry of Justice saw £1 capital to £11.53 paid in unitary payments.
- A comparison of the first five year period (1996-2000) of PFI procurement to the period 2001-2005 shows there was an improvement in the relative performance of PFI projects. There was a decrease from £1 of private capital resulting in £7.5 of unitary payments, to £1 of private capital costing £4.03 in unitary payments.

This demonstrates that projects over time and across departments did achieve improved long term results. The newer PF2 initiative hopes to build and improve on the PFI performance to further embed long term thinking within projects.

PF2 as with any other procurement method needs to encourage early engagement bringing together parties in an attempt to join up thinking and reduce the negative impacts of fragmentation.

Whilst this collaboration is seeing some improvements in the outcome of projects and specifications, pure alliancing and collaborative approaches are not the easiest or cheapest of procurement methods. Add to this the potential for issues given a fragmented industry and real effort is required to ensure clients have the skills to ascertain the true benefits of collaboration.

This again, however, is unlikely to work as it ignores several economic and behaviour factors:

- No economic value is currently placed on the process of building partnering arrangements, nor is there any value identified for the client team to drive the partnering process in collaboration with the supply chain. As such you cannot easily compare it with traditional tendering easily.
- Rarely is a procurement method (such as a collaborative agreement) subsequently compared to the likely outcome of the project had it been procured another way. As such there is no 'economic benefit or gain' recorded for the preferred procurement method. This also works in reverse for simple projects where partnering may be overly complex approach compared to other procurement methods given the required outcome.
- Social benefits are difficult to measure in a wider economic sense. Whilst clients attempt to measure these benefits directly (e.g. reduction in unemployment) there is little analysis of the long term impacts such activity has socially in a wider economic area.
- Given the lack of agreed methodology, social benefits are hard to capture in terms of their beneficial engagement with stakeholder and locals. A value should be placed upon such activities rather than just the process of undertaking such engagement.
- The economic utility (benefit) that is gained from the early transfer of knowledge between suppliers and other stakeholders within partnering contracts is currently undervalued. Such value is being given 'free' between parties with no recognition industry wide that such knowledge is vital to good project performance and outcomes.

Late payment

Late payment (the time taken to receive payment) of invoices is the most common complaint within the construction sector. For example, ACE's SME Benchmarking⁴² programme revealed that debtors of the participants were on average the equivalent to 85 days' sales. By sector it was found that there was a typical debtor period of 69 days for public sector and 79 days for private sector work.

On average 32% of revenue was received outside the contract terms and small firms spent 2.1% of Directors and Partners time and 1.8% of Senior Professionals time on payment disputes.

For smaller companies where cash flow can be volatile and so is vital and so has significant implications. Payment on time can mean the difference between operating profitable, or having to shut down and make people redundant.

The supply chain feels has not received the attention it should from the clients, but at the same time clients are reluctant to dictate, monitor and enforce what are contractual matter between private companies down the supply chain.

Initiatives such as the Fair Payment Charter and voluntary agreements have also been tried but few have had a significant impact on this problem which casts a dark shadow over what should be at most a very simple process within the wider procurement debate.

In an effective market, payments are assumed to occur at the point of transaction and so there is no cost or loss of economic efficiency. This is, however, not the case in real life with finance models such as invoice financing being established to address delayed payments. Given the impact late payment can have on smaller businesses, and the potential loss of economic and social efficiency that can occur due to late payment, minimising the effects of this issue should be important.

This, however, is difficult in the construction sector due to the significant sums involved, the way in which contracts are structured, the adverse view to risk and defects, and the need to manage costs within each tier of the industry. The above is part of the reason voluntary charters are ineffective, ultimately money has to be available to pass down the supply chain, and companies within that chain have to want to release payment.

An efficient market assumes that money between parties flows efficiently, and that where unavailable the cost of borrowing can be offset, this problem can therefore be considered a market failure.

This failure occurs because:

- Parties do not have sufficient cash flow to pass down the supply chain.
- Parties will act independently maximising their own profit, holding money to improve cash flow and earnings for as long as possible.
- The staging of payments within projects is not consistent with money being paid in an efficient manner.
- There is a lack of appreciation from clients that this market failure increases costs as parties further down the chain incur finance costs to cover shortfalls, which are then added to their overheads.
- There is a multiplier effect of this market failure down the chain, which is likely to increase transaction costs at each level.
- Limitations given the chosen type of contract.
- Parties are struggling to abide by contractual terms, with parties also scared to take action against each other. This results in a lack of trust despite the best collaborative intentions.

As such, addressing payment issues is more likely to be effective if policies focus on economic and business drivers between parties, whilst also attempting to maintain consistent co-operation.

Intra supply chain relations

The second issue that occurs as a result of a fragmented supply chain where margins are squeezed is how parties treat each other within the supply chain. For example:

- “The re-bidding of packages by main contractors to drive down prices is having the effect of reducing lead-in times for sub-contractors once the work is awarded.”
- “Instead of drawing opportunity up from the supply chain, there is a determination by main contractors in particular to tender every package, every time, and select on the basis of lowest price.”⁴³

This rebidding can occur despite early collaboration with these parties as part of a consortia or partnership to bid for work off of the ultimate client.

Such practices demonstrate the need to reduce costs and the unsustainable nature of such practices. They also reduce the time available for innovation and project improvement.

Again, however, there is a misconception that the ultimate client and the procurement process should be responsible for this outcome.

Negotiation between parties is part of a functioning market mechanism, which ensures price efficiency. Part of this process will, therefore, involve a variety of engagement, working

together to form a bid before contractual terms are signed.

The supply chain should be able to form reasonable relationships between parties without the ultimate client having to mandate contractual requirements.

Again, looking beyond the basic desire that parties will work together for a 'group outcome' it is found that:

- Parties will act independently, reducing costs of suppliers below them to improve their margin.
- Suppliers above your company in the chain do not have the same motives as that of the ultimate client.
- With each layer of fragmentation, whilst cost increases may be avoided for a given specification, what is apparent is the time for innovation is reduced. This limits the 'collaborative' nature of this process, thus reducing the economic potential of the project.
- The risk of disputes does not only involve the two parties directly involved. There is also significant public and political risk to the ultimate client which is generally underestimated. Just as the industry prices in risks passed down the chain clients will also 'price and assess' such risk when deciding on their provider.

Skills, apprenticeships and training to drive change

Many reports have picked up on the need for behaviours to change in the construction sector, with the aim that better working practices should become commonplace.

Project teams and good site management are generally cited as being important in driving such cultural change. The link to the client and cooperation of project teams is also consistently considered to be of significant importance.

This cooperation, however, will always be informal in nature and so its effectiveness varies significantly across the construction sector.

Given the above, there is much discussion within the supply chain of needing to improve management skills and training. This is, however, generally followed by the statement that companies do not have the resource to undertake such training and that clients generally do not incentivise such behaviours. For example in 1998 it was highlighted that the industry needed to be committed to its employees and skills base.

- "Commitment to people: this means not only decent site conditions, fair wages and care for the health and safety of the work force. It means a commitment to training and development of committed and highly capable managers and supervisors. It also means respect for all participants in the process, involving everyone in sustained improvement and learning, and a no-blame culture based on mutual interdependence and trust."⁴⁴

The industry, however, continues to struggle to invest in its own skills base. This ultimately also has a detrimental effect on its attractiveness to young individuals who will be needed to be the supply chain of the future. Industry has recognised that this is a challenge it needs to face up to. For example in the Construction Strategy it is stated:

- "Change is required in the construction industry itself and in how the construction industry is perceived by the public. Industry and Government must work together to inspire young people."⁴⁵

Whilst the above is good news in recognising the challenge, industry still has significant work to do to actually build a tangible and attractive offering. For example, the Construction Strategy suggests:

- “Improve the image of the industry by inspiring young people and through a co-ordinated approach to health and safety and improving performance in the domestic repair and maintenance market.”⁴⁶

Health and safety and domestic repair and maintenance will not attract young individuals into the industry. Health and safety in the modern world is expected of employees and employers, and repair and maintenance does not have the interest or scale of earning potential to ever be a significant draw.

Industry needs to re-evaluate its offering, youngsters look to the likes of High Speed Two (HS2), the Olympics, Virgin Galactic, Crossrail etc. to provide the vision that makes them want to enter an industry. Wolstenhome outlines how such an image is needed for the younger generation stating:

- “This, together with the dramatic changes being driven by advances in material technology, the green agenda, the internet revolution and globalisation, could create the most exciting and dramatic period for our industry since the industrial revolution.”⁴⁷

Looking more specifically at health and safety it is an area which achieved significant improvement. Such change has also occurred in a manner which involved the training of staff, so why haven't similar changes not taken place more widely in other areas?

The first reason is that regulatory requirements in this area can be strong and enforcement ensures that companies train staff to ensure compliance. Another reason is that despite an improvement being beneficial for the industry a strong personal motivation i.e. reducing your own personal risk of injury. Such targets and performance measurements have also been discussed previously as a driver for improvement.

- “Our experience tells us that ambitious targets and effective measurement of performance are essential to deliver improvement.”⁴⁸

The reason why general skills and training have not managed to achieve a similar results is related to the following:

- Individuals do not consider the wider benefits to the sector performance as a whole of their training and skills, with their personal skills profile likely to be more closely linked to wage increases.
- There is an assumption from clients that companies have accounted for the investment requirements required to adapt and train the skills they require. This assumes that companies are fully aware of future project pipelines and client requirements which is simply not the case in reality.
- It is generally ignored that companies are able to import or utilise international skills which leads to a shorter term view on investment into skills and training.
- Encouraging young individuals into an industry requires a balance of providing ambitious and interesting projects and wage expectations. As an individual moves towards the point of entering an industry it is also important to recognise that the requirement of the later also increases.
- There is currently a lot of complexity with various qualifications and entry routes into the supply chain which can put young people off.
- The construction sector needs to improve its image/offering to the next generation.

- Clients assume that within ‘the market’ there are the skills required to deliver a project, yet especially at a younger and graduate level the skills available are based on those provided by a state education system and not necessarily those which a company (i.e. the market) actually requires.
- There is a large variation in procurement methodologies from traditional through to a totally collaborative approach. The same skills are not required to deliver each of these approaches. This not only makes it more difficult for client to identify and develop skills, but it also is challenging for industry to ensure it has a good balance of skilled individuals to account for such variations.

Design

Design is an important part of controlling complexity, planning, functionality, architecture, build cost and future project costs and generally accounts for a small percentage of overall budgets. To improve performance it is important that clients move away from the traditional one stage procurement method towards a two stage process with early market engagement to ensure that designs and cost can evolve using all the expertise available.

Traditionally, there has been much comment on management and the complete ‘buy in’ of an organisation to ensure the implementation of effective procurement to drive performance and innovation. For example:

- “Committed leadership: this is about management believing in and being totally committed to driving forward an agenda for improvement and communicating the required cultural and operational changes throughout the whole of the organisation.”⁴⁹

Whilst this in theory is correct there is no relation to resource and time and where within the process such resource can have the greatest effect. For example, inefficient design, design changes alongside a general lack of resource or increasingly tighter time frames for design all have a significant impact on the outcome of a project. Omissions are generally much cheaper to correct at the design stage than those that occur once on site, where small changes could have significant cost implications.

- “It is about how the relatively small up-front costs of design and construction can have such huge consequences for future users, whether expressed as business or social outcomes, as well as for the environment.”⁵⁰

As such it is important that clients allow for a reasonable lead in time for design to occur, going faster to get an inefficient outcome benefits nobody.

Again it is important to think about how behaviours influence the design process within procurement.

- The client will strive to speed up the design time, whilst trying to achieve the best outcome.
- The investment decision and process should incorporate some feasibility and design elements. The result of this early process which informs the rationale of future decisions is not always communicated well as the commissioning process continues. This is because behaviours which ensure smooth information flow need to be proactive and not passive.
- Suppliers need to better understand that influencing the design of projects positively is done before the tendering phase starts within the investment decision process.
- The design needs of the client are not always aligned with that of the capability of the supply chain. Ultimately, however, it has to be understood that the client is the one

driving the direction of the project, given their investment requirements to achieve a wide range of social and economic outcomes.

The cost of change

The construction sector is one where complexity will always result in some degree of project adaptation. The cost of making such changes is, however, often forgotten or underestimated.

The client has a need, which engineers, contractors and architects if engaged early enough will attempt to meet in their design. Once construction starts, however, changes increase in cost. As such, any changes should be limited to those which are absolutely necessary.

If wholesale changes are required, it is often the case the client's needs and the communication and design of these needs has broken down somewhere in the process. It is important to note here that a client's needs are not only the outcome they want but also the finance they have available. It may be the case that the outcome and need have to be adjusted if the desired outcome cannot be met within the financing envelope that is available.

One would assume changes are good for the companies delivering the project but as a recent report highlighted "the cost of implementing change outweighed any income premium they might receive as a result of the change."⁵¹ This means that ultimately there is little financial benefit to change within the supply chain but there can be significant costs to the client when such change occurs.

It is also important to understand the knock on effect changes can have. Whilst making an individual change may seem to have little effect on a project they can actually have significant effects on other requirements and costs.

To give an extreme example a client may specify solar Photovoltaic cells (PV) and triple glazing etc, but adjusting the orientation of the building could result in many of the efficiencies from the above being lost. It should be noted though that the decision on this example is made very early in the design of a project.

Whilst there is much research on managing changes and the effect of them there is very little evidence in terms of quantifying the cost of changes. This is a problem when attempting to a figure on the importance of minimising changes.

Therefore to demonstrate how costs can build up this report builds a simple model to illustrate the effect of change.

If you assume a project of £100,000 is completed with 50 stages (50 is assumed as it provides a long enough scale for change but is not overly lengthy), There are three changes to the project, with a capital cost of 0.0075% of the total project cost (£750). This cost, however, then has implications for the next phases for each change to the extent of 0.8% of the previous amount.

One change lasts for ten phases, one for 25 phases and one for the whole period. This results in all three changes costing £10,833 or almost 11% of the overall value of the project.

This shows how three changes can have a significant effect on a projects cost despite the initial outlay being low. For the full set of results please see Appendix A.

Again it is important to explore the rationale for changes, and what the motives behind these changes are if the industry is to encourage reduction in the future.

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- Change occurs primarily because an issue has been identified that parties did not identify, or could not foresee, at an earlier stage within the process. This suggests that earlier engagement can help to limit change.
- The issue with change is that it instantly starts a process of negating and mitigating responsibility and risk from all parties including the client. That is to say it may start a process of protective behaviour. It is important to recognise that this behaviour will occur even within structures such as alliances. Every company will protect their own position. There is, however, a key difference with the client and that is that ultimately they are the party that has to absorb the cost of changes.
- Changes occur for many reasons such as product knowledge, capital cost, future operational cost, practicality etc. It is important to recognise that the parties involved in the project will not have the same balance of priorities for each of these items.
- It is often forgotten that the cost of implementation of change varies significantly across a project. Changes made at the design process can be accommodated relatively cheaply, whereas changes once construction has started is much more costly.
- It should be recognised that the industry will never eliminate change, as such a more comprehensive focus on the cost of change would be more useful in encouraging clients to make efficient decisions.

Innovation

Innovation is often spoken about within the construction sector, with the emphasis being on improving the speed, quality or cost of innovation. There is also an issue with defining what innovation is, and measuring it. Put broadly innovation is:

- “The process of translating an idea or invention into a good or service that creates value or for which customers will pay.”⁵²

Within the construction sector there are a lot of improvements that take place as part of the design and building process, with continual efforts to develop improved ways of working.

Historically there is a view, however, that the construction sector does not invest in R&D and innovation as much as it could do. For example, the Rethinking Construction report stated that:

- “In-house R & D has fallen by 80% since 1981 and capital investment is a third of what it was twenty years ago.”⁵³

Given the nature of construction not only as a physical process but also more increasingly as part of an investment and maintenance process it could be argued that many innovations would not necessarily be picked up by R&D expenditure. This report therefore questions if the level of innovation in the sector is as low as is perceived to be the case.

Another area of concern is that there appears to be an assumption that unless incentivised innovation does not take place. For example:

- “A major problem is without doubt the lack of incentives currently provided by client business models for a supplier to innovate and deliver more sustainable solutions.”⁵⁴

It is perfectly normal for industry to deliver a project and innovate to produce sustainable solutions within a defined budget, subject to client approval/sign off. The industry should therefore not be portrayed as one that does not innovate purely on the basis of a lack of client lead incentives.

Whilst there are always arguments that further improvements could be made, or that innovation should be incentivised to a larger extent within projects, there has to be a realistic view of amount of money a client is able to spend upfront to improve future performance and the extent to which innovation increases risk. Such considerations, clients would insist are made even when they have to procure based on cheapest cost.

This raises the question as to how you innovate further. Again to do this it is important to understand the drivers of behaviour that encourage innovation.

- Firstly, it is important to recognise that innovation is primarily there to reduce costs, improve profits and/or improve performance. The benefit of this can be for the client, for the company itself or both.
- Innovation that benefits the client solely will not be undertaken unless the client incentivises such behaviour. Whilst some may argue that this is not true, a rational company will only undertake innovation if there is a benefit, and it must outweigh the cost of that innovation. This benefit does not have to be in cash, but could for example be gaining a competitive advantage. Basing policies around irrational behaviour will not improve the situation in the future.
- A client's, owner's and company's view of innovation is different, as is the priority for areas of innovation.
- Not all experimentation (innovation) works. Some ideas end up with little benefit and can be costly and as such it is important that the overall benefit is considered and not just activity on individual projects. This is, however, difficult if clients procure a low number of projects.
- Innovation that relates to genuine product development generally only succeeds if a company can guarantee its intellectual property rights over developments.
- There is a conflict between government wanting industry to innovate for efficiency savings across the sector as a whole and companies which will wish to innovate to gain and a competitive edge, and limit intellectual transfer of innovate ideas.

Engagement, tendering and competition

One item that was identified as far back 1998 in the 'Rethinking Construction' report was effectively the balance that takes place between engagement, tendering and competition. That report suggested:

- "The industry must replace competitive tendering with long term relationships based on clear measurement of performance and sustained improvements in quality and efficiency."⁵⁵

Or more specifically that:

- "The most immediately accessible savings from alliances and partnering come from a reduced requirement for tendering. Whilst this may go against the grain, especially for the public sector, it is vital that away is found to modify processes so that tendering is reduced."⁵⁶

Realistically, the removal of competitive tendering is not going to happen. To put this in perspective this amounts to private companies wanting to minimise their cost of bidding and maintain income while at the same time have competition on items they purchase to ensure prices are low and effective for their operations.

Clients are not and will not give up practices which help to promote efficient pricing. Competition is at the heart of open market principles, with laws put in place at both the UK and EU level to ensure that markets operate in such a manner.

There does, however, have to be some recognition of what competitive tendering can mean for a client in terms of loss of knowledge. So what is more important is to be pragmatic about the balance between engagement, tendering and competition within the procurement process and what parties can do to undertake smarter procurement.

Again focusing the behaviour of parties and economic rational of the process explore behaviours, it is found that:

- Clients will put in place procedures that encourage lower prices. If this is done efficiently prices from different parties will reflect the same project outcome and not compromise on their need.
- Early engagement can help to deliver a better project. For example, EC Harris recent analysis⁵⁷ revealed that established relationships and early involvement in projects are enablers of high project performance.
- Competition brings benefits but it assumes certain conditions such as participants having all the information required, the client being clear about what they are purchasing, efficient finance and capital availability, skills availability etc. Whilst not all of these conditions will always be met, and so competition may not be optimal it is important strive towards an effective market that balances all of these aspects.
- The aspect which is generally overlooked in competition is time. Much of the waste in the procurement process is related to the time things take. Competition needs to quickly and efficiently establish a shortlist where further detailed exploration can take place.
- There will be a tendency for individuals to favour companies and project teams they have procured and worked with in the past as there is increased confidence in their abilities but also understanding of their working practices. Whilst such behaviours will not necessarily affect the outcome of a competitive tender it is important to recognise that such behaviours still exist.
- Tenders and contracts themselves drive behaviours from a company's decision to submit, through to the type of approach companies actually take. The process is also generally regressive so discourages SME's from bidding given the time and cost commitments.
- Early market engagement provides clients with valuable information and should not influence any decision on the final party employed in a project. It should, however, be noted that there is a conflict for the supply chain between providing good ideas up front and saving them for the tender itself. As such, unless the process is well designed (such as two stage tendering) to account for such instances issues can arise which affect the performance of the procured outcome.
- The procurement process is wider than just the process of buying. Engagement within business cases and plans should have been undertaken with industry long before any early engagement as part of the final buying phase.

Managing risk

Managing risk is very important for the efficient delivery of projects within the construction sector, with attitudes to risk dictating how innovative projects can be in delivering value for money.

- “How projects come to market has a significant impact on the ability of the construction industry to provide innovative, value for money solutions. Much waste in construction is driven through the approach to risk across the supply chain.”⁵⁸

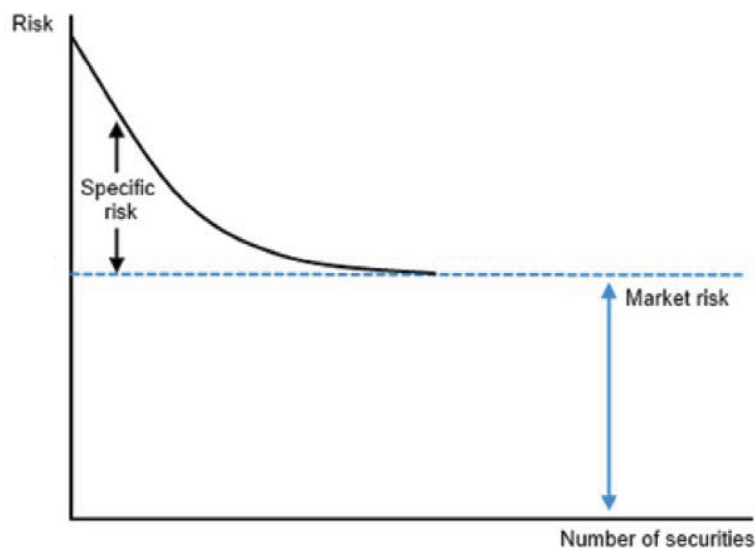
Currently across the public sector it is generally accepted by the clients that risks should be managed by the party best able to deal with them. This means that clients attempt to mitigate and shift risk where appropriate to the supply chain.

This method has some limitations, however, for instance, if the client does not recognise that a Tier 1 supplier will in turn attempt to pass on risk whilst maintaining the risk premium they commanded. As such, risk can end up with parties the client never intended, and a holistic view to risk is lost. It is also the case that the party who undertakes a certain risk is solely the person who incurs costs should these risks become reality.

The supply chain on the other hand operates and manages risk by having a various and wide range of projects across different sectors to offset each other. That is to say lower risk and more profitable projects subsidise higher risk and potentially costly projects.

This approach works in a similar way to portfolio theory of investment which is used to maximise return for a given level of risk, or minimise risk for an expected return.

As can be seen from the diagram below, as an investor increases the number of securities they reduces the amount of specific risk they are taking. This is because as the number of securities increases (assuming they are all not in the same sector/area) so too does the extent to which returns vary across different securities, and each will not be affected to the same degree. Some may even move in the opposite direction. This essentially means that any losses may be offset by the movement of other securities. reducing risk.



Source: ACE, PPFM report

Alongside the above there are other tools such as contractual agreements and insurance which also help to manage risk.

Whilst all of these measures are valid, a number of discussions need to be had in detail around risk if procurement is to become a more efficient. For example:

- It is generally overlooked that the client's abilities to manage the procurement process and risk vary significantly. As such, one client may be able to deliver a project in a way which others are not.
- Rethinking construction suggested that "effective partnering does not rest on contracts. Contracts can add significantly to the cost of a project and often add no value for the client. If the relationship between a constructor and employer is soundly based and the parties recognise their mutual interdependence, then formal contract documents should gradually become obsolete."⁵⁹ This is, however, an unrealistic view both clients and private companies will always want to protect their interests legally. Recognising such behaviour is important if we are to find real efficiencies going forward.
- The supply chains ability to manage risk also varies. As such, if the procurement process does not account for company to company and contract variations it is possible to end up with a supplier that is less able to manage risks (under certain models) than was anticipated. In this circumstance an additional 'cost factor' needs to be accounted for given the risk is higher.
- Are procurement improvements such as alliancing, risk sharing etc mitigating risk or simply pushing down the risk premium? If it is the later the long term risk and cost to industry and clients will become unsustainable.
- It is important to remember that the client function sees procurement as part of the process of assessing and reducing the risks to which it could be open. As such, if industry wishes to streamline this process it has to justify where this risk has gone or where else it can be managed more effectively.
- When risks are passed to the supply chain to be managed do they end up with the appropriate party? Given the scale of Tier 1 and Tier 2 suppliers it is possible for them to push risks further down the supply chain where there is not the scale or expertise to deal with such risks.
- It is important to recognise that some risks are unmanageable for clients. For example, the risk of late payment or breaching contract terms between Tier 3 and 4 suppliers will be impossible for a client to manage as these could equate to hundreds of companies given the fragmented nature of the supply chain.
- When risks are transferred, the management of the risk may also be transferred but the cost of failure may not. For example, the recent systemic failure of the financial sector required the government to bail out an industry at a level where such risk had never been considered. Alternatively at a project level, the actions of governments to step in following the demand uncertainty in the Royal Armouries Museum PFI demonstrates more locally how risk mismanagement ultimately affects the client despite being transferred to the private sector.
- There needs to be greater recognition of the connection between risk and uncertainty. This can create significant costs in terms of time, and so reducing uncertainty by understanding risks is key.
- Whilst construction does have some repetition in terms of construction processes, each project can vary significantly making them effectively a 'one off'. As such, the complexity of projects require skill levels throughout the procurement process to ensure there is a sound understanding of how such projects are delivered. A building is not just a repeat order.

APPENDIX A

	Project 1		
	Change 1	Change 2	Change 3
Target cost		£100,000	
change cost		0.0075	
Re-occurring rate		0.8	
phase effect (time)	10	25	50
Phase 1	£750	£750	£750
Phase 2	£600.00	£600.00	£600.00
Phase 3	£480.00	£480.00	£480.00
Phase 4	£384.00	£384.00	£384.00
Phase 5	£307.20	£307.20	£307.20
Phase 6	£245.76	£245.76	£245.76
Phase 7	£196.61	£196.61	£196.61
Phase 8	£157.29	£157.29	£157.29
Phase 9	£125.83	£125.83	£125.83
Phase 10	£100.66	£100.66	£100.66
Phase 11		£80.53	£80.53
Phase 12		£64.42	£64.42
Phase 13		£51.54	£51.54
Phase 14		£41.23	£41.23
Phase 15		£32.99	£32.99
Phase 16		£26.39	£26.39
Phase 17		£21.11	£21.11
Phase 18		£16.89	£16.89
Phase 19		£13.51	£13.51
Phase 20		£10.81	£10.81
Phase 21		£8.65	£8.65
Phase 22		£6.92	£6.92
Phase 23		£5.53	£5.53
Phase 24		£4.43	£4.43
Phase 25		£3.54	£3.54
Phase 26			£2.83
Phase 27			£2.27
Phase 28			£1.81
Phase 29			£1.45
Phase 30			£1.16
Phase 31			£0.93
Phase 32			£0.74
Phase 33			£0.59
Phase 34			£0.48
Phase 35			£0.38
Phase 36			£0.30
Phase 37			£0.24
Phase 38			£0.19
Phase 39			£0.16
Phase 40			£0.12
Phase 41			£0.10
Phase 42			£0.08
Phase 43			£0.06
Phase 44			£0.05
Phase 45			£0.04
Phase 46			£0.03
Phase 47			£0.03
Phase 48			£0.02
Phase 49			£0.02
Phase 50			£0.01
Total each change	£3,347	£3,736	£3,750
Total all three changes		£10,833	
% of project cost		11%	

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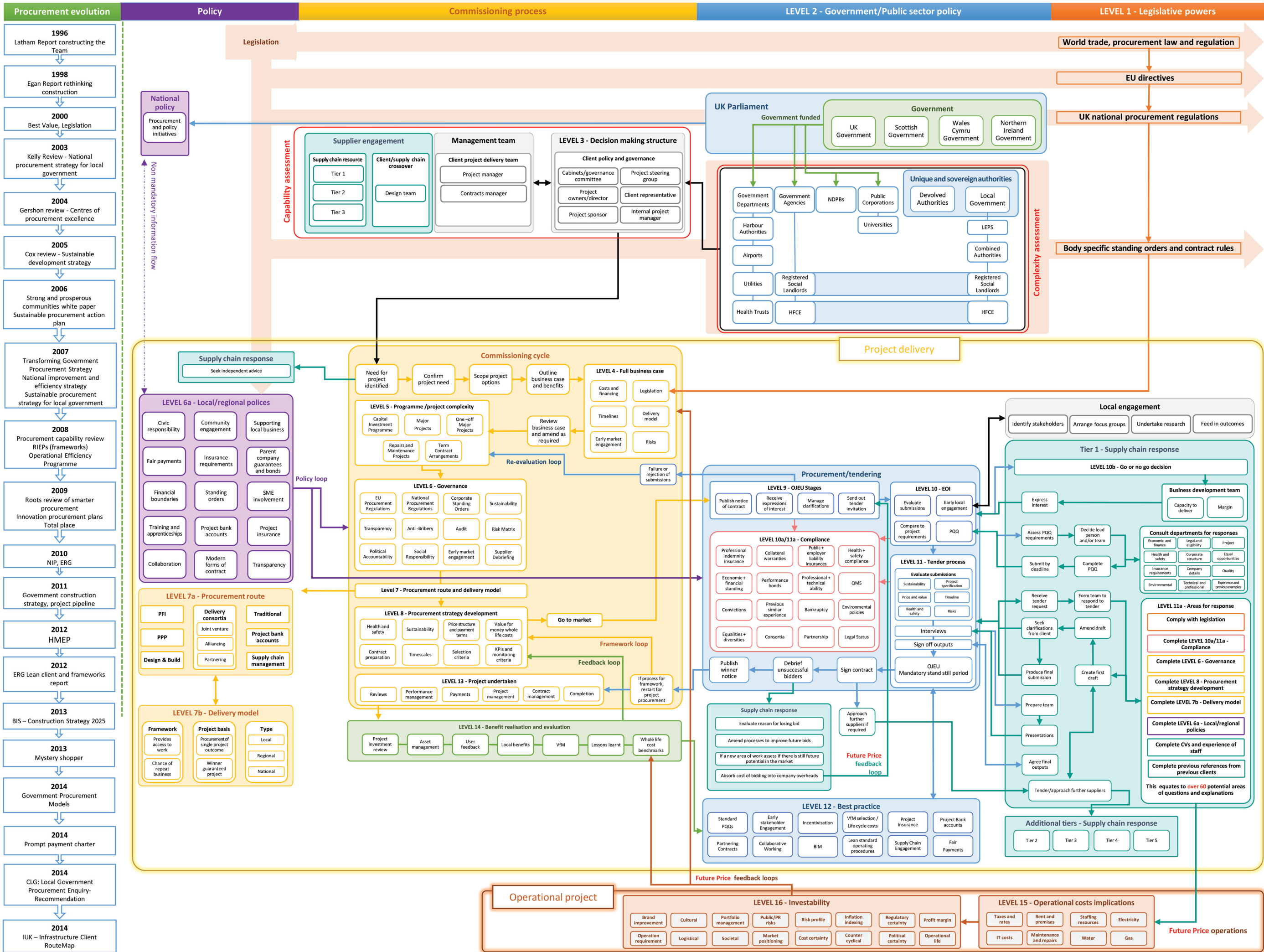
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