

Centre for Science and Policy

Early Adoption of Innovation



Summary report of the discussion held on 19 January 2023

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Introduction

In January 2023, the [Centre for Science and Policy](#) (CSaP) in partnership with [Innovate UK](#) (IUK) organised a Policy Workshop on the role of Government as an early adopter of innovation. The workshop brought together a cross-section of civil servants and academics to identify steps and actions that could drive forward rapid diffusion of innovation and adoption of new technologies in the public sector and public services to improve efficiency and productivity. The workshop addressed the following questions:

- How important are technological innovations relative to other innovations in improving the performance of the public sector and public services?
- Where might we be missing opportunities to diffuse and adopt innovations that could make a big difference to the public sector and public services?
- What would adoption of these technologies require in terms of the structure and design of the public sector and public services, strategy, policy, skills, and training?
- What are the barriers to the adoption of innovation? How should one go about creating an organisational culture in the public sector and public services that supports the rapid diffusion of innovation and the rapid adoption of new technologies?
- What practical examples of the rapid diffusion of innovation and the adoption of new technologies in the public sector and public services can we learn from?
- What practical steps can IUK take to raise awareness of and support for early adoption of innovation?

Background

Innovation matters in every sphere of our life. It was pointed out that sometimes innovation is seen as something that matters only or largely to the private sector or is only something the private sector can benefit from – with policy focused accordingly on the private sector.

However, innovation can have a significant transformative effect on the public sector and public services – boosting efficiency and productivity and making a difference to people's lives.

How can public sector innovation bring benefits?

- By directly improving people's lives – advancing health and wellbeing, tackling social problems, improving our environment, and so on.
- By raising productivity – innovation allows a given input to deliver greater outputs, such as better social and economic outcomes.
- By facilitating fiscal sustainability – The [Office for Budget Responsibility](#) has shown that even relatively small changes in public sector productivity growth can have substantial effects on public sector net debt as a proportion of GDP over the longer term.
- Efficient, innovative, and well-run public institutions may produce spill-over productivity and other benefits for the private sector – such as human and social capital – which in turn contribute to a well-functioning market economy.

What do we mean by innovation?

Innovation is much broader than just new technology – although technical and technological advances in computing, digital technologies, communications (including virtual consultation in medicine and distance learning in education), and robotics can have important and profound implications for public services such as health and social care, education, and public administration whether in central or local government.

More broadly defined, innovation embraces:

- **Scientific and engineering innovations**
- **Organisational and social innovations** – new ways to address social and organisational challenges such as [What Works Centres](#), the [Government Digital Service](#), the [Behavioural Insights Team](#), and so on.

- **Funding and contractual innovations** – new ways to incentivise new approaches to the prevention of and early intervention in social problems, such as [Social Impact Bonds](#).
- **Analytical innovations** – new ways of identifying problems and where to target solutions – such as predictive analytics and AI – and new ways of measuring impact, such as RCTs.

There are other dimensions of innovation, but it is important to clearly define and promote innovation in its broadest sense across the public sector and public services.

How can we measure successful innovation?

Innovation can improve and make the public sector and public services more productive and effective and efficient. What exactly do these concepts measure?

- **Productivity** measures how much output is produced for each unit of input
- **Effectiveness** refers to the extent to which outputs are translated into outcomes
- **Efficiency** is the ability to generate outputs in a way that results in the least waste of time, effort, and resources. This leads to a crucial distinction between
 - i) **Technical efficiency** – doing things we do now either at less cost or getting more output for the same cost and
 - ii) **Allocative efficiency** – finding wholly different ways to achieve desired outcomes at substantially less cost.

Measurement challenges and recent trends

There are formidable measurement challenges when estimating public service productivity and efficiency. These include obtaining robust data on costs, turning cost and price data into volumes of inputs and outputs, adjusting outputs for quality and attributing changes in outcomes to changes in outputs. It is important to be aware of these limitations when interpreting data on innovation in the public sector.

According at least to the measures we have available to us, private sector productivity has typically grown faster than public sector productivity. Since the 2008 financial crash, however, private sector productivity in the UK has flatlined whilst public service productivity has grown. Public sector productivity increased by an average of 0.7% per year from 2010 to 2019 but fell in 2019 after 8 years of consecutive growth. This improved public sector productivity has been attributed in part to innovations prompted by austerity following 2010.

More broadly, [research that has been done on the drivers of public sector productivity and efficiency](#) has identified at least five key drivers:

- The use of markets and competition
- Service re-design and the use of alternative delivery mechanisms
- Organisation and workforce drivers
- Technology, data and targeting
- Hard budget constraints and spending flexibility

Although there does not appear to be a single key driver for public sector productivity, there does appear to be a crucial role for innovation and there are clear benefits from the early adoption of innovation in the public sector for each driver.

Public Procurement of Innovation

PCP (Pre-Commercial Procurement) and PPI (Public Procurement of Innovative Solutions)

In the UK there are two primary approaches to public procurement of innovation: pre-commercial procurement (PCP) and public procurement of innovative solutions (PPI). PCP involves governmental procurement of a research and development service; it is an important tool to stimulate innovation as it enables the public sector to steer the development of new solutions directly towards its need. PPI involves procurement of innovative solutions that are not yet available on a large-scale commercial basis when the

public sector uses its purchasing power to act as early adopter of such innovative solutions. Hence, whilst successful PCP should lead to a PPI process, PPI does not need prior PCP.

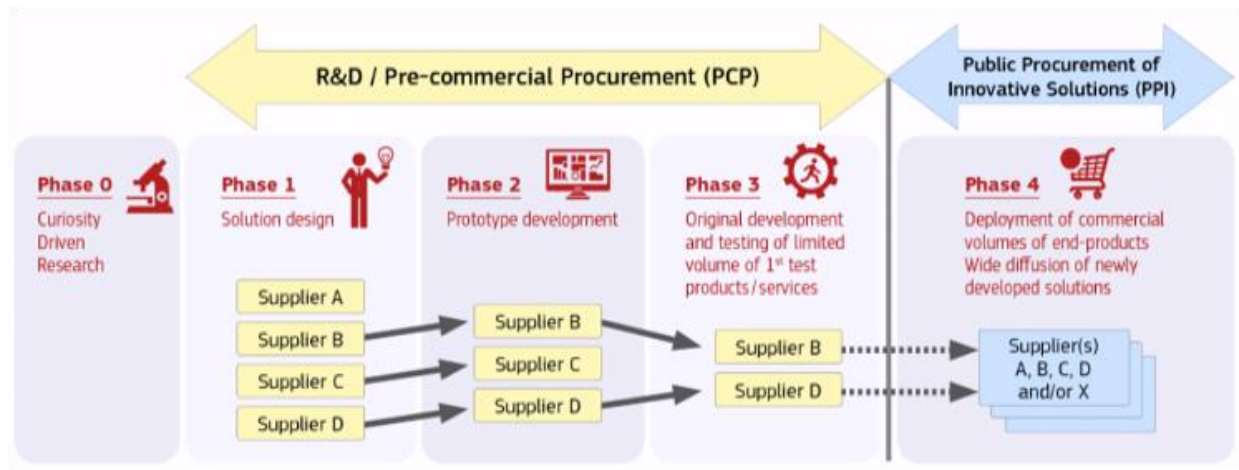


Figure 1. Public procurement of innovation – landscape(Source: Innovate UK slide deck).

SBRI (the Small Business Research Initiative)

[SBRI](#), the Small Business Research Initiative, is the Government’s pre-commercial procurement programme. It allows R&D services to be acquired from private sector providers who develop, in competition, innovative solutions to problems faced by the public sector. As can be seen in Figure 1, Government organisations request proposals in a competitive process, and contracts are issued to businesses that offer the most promising solutions.

Innovate UK has been custodian of SBRI since 2009 and provides support to numerous organisations – over 100 public sector organisations have used SBRI. The scheme offers small businesses the chance to win a contract to help demonstrate and develop new technologies. To date over £1 billion has been invested using SBRI across the public sector.

At present successful providers must re-enter procurement at the end of the demonstrator phase (Phase 3). However, as participants pointed out, the new Procurement Bill going through Parliament would remove this requirement, facilitating a smooth transition from PCP to PPI.

Participants identified a series of key challenges for the successful implementation of pre-commercial procurement in the public sector.

- PPI is not embedded as business-as-usual, and PCP is barely embedded at all.
- PCP is not widely understood, and neither is the SBRI brand.
- Many projects within the public sector feel opportunistic rather than tactical or strategic, with no set budgets and little to no consistency in the type or scale of problems to be solved.
- **Implementation issues**, such as commercial readiness, scalability, organisational change, and business cases.

Summary of the Discussion

The discussion encompassed a diverse range of ideas, suggestions, and examples. Broadly, however, it addressed three key themes:

- What are the desired **outcomes** of innovation and how should the public sector approach failures in achieving these? How might opportunities and successes look different on a local scale, compared to the national scale?
- What are the **barriers** to implementing innovation and innovative solutions in the public sector and across public services?
- What **metrics** are used to measure the success and impact of public sector investment in innovation and how robust are they?

Outcomes

Risk, Failure and Behavioural Change

There are various sites of risk involved in the public procurement of innovation, including supply-side risk and demand-side risk, as well as risk of technological failure. Several participants pointed out, however, technological risk is the least threatening given that it is relatively easy to demonstrate whether technologies work or not. For the public sector, the most significant risk is that of rolling out an unproven solution, alongside concerns about a

lack of uptake in government. As one participant pointed out, however, the point of PCP is that it is a funnel; this protects public services from becoming locked into a single supplier and ensures the greatest chance of success at the point of procurement. Most public spending on R&D is by a grant mechanism; one of the benefits of SBRI is that it is a contract and payment on delivery and therefore involves less risk than a grant. SBRI can also be described as an *embedded* way of thinking that gives public services a greater level of control over outputs and outcomes.

One theme that emerged frequently was the centrality of failure to successful innovation. As one participant pointed out, there are a vast number of failures in the run-up to any successful innovation, and it is important to acknowledge those failures in order to generate insight into the general direction of travel. Moreover, participants raised the importance of finding constructive ways to communicate risk in the case of PCP and PPI. Given that investing in R&D necessarily involves taking risks with public money, policymakers and politicians need to find ways to justify and explain failure when it occurs.

Local-Level Outcomes

SBRI PCP can in principle be used by anyone and has been used to support local authorities as well as central government departments. However, one participant pointed out that opportunities and potential successes look different in different contexts. It was also mentioned that defining outcomes as accurately as possible is crucial, and that local-scale innovation gets missed if the focus is on the national level innovation only. Local authorities have a different benchmark for success and are typically interested in improving local engagement and solving wicked problems in local contexts. One example cited was the difficulty of organising effective and sustainable commercial waste collection in Westminster. At present there are fifty businesses collecting commercial waste in the Borough of Westminster, creating significant emissions, higher risk of traffic accidents, and so on. The New York City Council's Department of Sanitisation (DSNY) – who encountered the same problem in 2019 – franchised Manhattan into a series of Commercial Waste Zones which they then auctioned off as franchises. When Westminster City Council tried to pilot a similar scheme in Westminster, the central government would not approve the mechanism due to dogma about competition. This example also demonstrated the fragmented nature of Whitehall: some government departments were supportive, while others were not.

It was stressed that there is enormous potential to use SBRI at a local level. However, one participant raised the concern that local authorities do not have sufficient understanding of the SBRI model. In response to this, Innovate UK has spoken to the Local Government Association (LGA) to get local authorities to band together – many of the problems local authorities face are problems for multiple authorities.

Cities can lead the way for the public sector adoption of innovation. As one participant pointed out, there are plenty of examples of public sector innovation being used to address city-level challenges outside of the UK in places like Barcelona, Stockholm and Helsinki. One participant discussed research they had been involved in in Galicia, the region of Spain that is the leading user of PPI models despite its remote location. Researchers emphasised several considerations for successful PPI, including:

- The investment of time and resources to build the capacity and effect the institutional change required to make PPI mainstream
- A focus on the long-term changes needed for successful procurement, including work investigating and articulating challenges and barriers
- Working closely with the private sector stakeholders to co-produce challenges in order to ensure that when the market arrives, it is sufficiently transformative to address the relevant public policy challenges and avoids ‘solutionism’ – innovation for innovation’s sake

Barriers to Implementation

Systems Thinking

Participants emphasised the importance of a systems approach to innovation, i.e., an approach that does not limit its focus to technological innovation but also considers enabling context. As one participant pointed out, it has long been recognised that innovation is not a linear process but a system; hence, it is necessary to understand this complex set of relationships – knowledge flows, actors, and institutions – to understand how innovation comes about. This is important for anyone who wants to invest in innovation and support it from a policy perspective.

One implication of the failure to adopt a systems approach to innovation is that organisations do not track the knock-on effect of changes in parts of the system. Downstream, this can create difficulties if, for example, increased productivity in one component of the organisation generates decreased productivity in another (research has documented this phenomenon in supply chains). To overcome this barrier, senior management need to consider the coherence of the system *in toto* as they adopt new technologies, paying attention to how this can affect incentive structures, productivity, and efficiency across other parts of their organisation.

Moreover, participants discussed how the way procurement is organised in the public sector acts as a barrier to adoption of innovation. Specifically, participants were critical of a risk-averse and over-bureaucratised approach to procurement that can make it difficult for new service providers (startups and SMEs in particular) to secure a contract with public sector organisations. Instead, preoccupation with protecting public money frequently leaves public sector organisations ‘locked in’ with a single supplier, favouring large businesses over innovative solutions. Instead, procurement should focus on managing and communicating – not avoiding – risk; procurement training could be a good opportunity to introduce the model of PCP. It should be noted that procurers and commercial teams also look for contracts, T&Cs and long-term service conditions that are not conducive to doing something new and different.

Skills and Workforce Capacity

To translate innovation into productivity, the public sector needs to secure the skills and workforce capability to leverage innovation as well as take into consideration what emerging skills would be important to enable innovation in the future. One participant pointed out that the level of pressure public sector professionals work under severely restricts their ability to think beyond day-to-day challenges; solving challenges around capacity, capabilities, resources, and the inertia of business as usual would unlock the potential to invest resources in innovation.

It is difficult, however, to generate public sector commitment to invest in challenges that seem ‘mundane’ and hence boring. It was pointed out that it is hard to get relevant

stakeholders in the policy making world to engage with such problems. Yet, solving them through adoption of innovation has real potential to improve productivity.

Autonomy

Several participants cited central government's control over how policy is rolled out in localities as a key barrier to encouraging a culture of innovation across the UK. One participant gave as an example the central government roll-out of [T-levels](#) – technical-based qualifications that will constitute an alternative to A-levels; other participants cited a lack of regional autonomy as a key factor in the lack of policy interventions that have been piloted in devolved authorities (see below). More broadly, participants emphasised that it would be useful to do primary research with public sector organisations that have benefitted from the SBRI model and those that have not to generate insight into what precisely are the barriers and enablers.

Metrics and Data

Defining 'Success'

One challenge that was raised was that of defining the outcomes of investment in innovation in concrete terms. For example, one participant pointed out that it is difficult to measure 'success' without specifying the relevant counterfactual, i.e., what 'failure' would look like or what will happen if we do not improve? One participant, for example, pointed out that the metrics for success in Government are sometimes defined such that they bias the answer. As an example, they cited the [Department of Health and Social Care initiative to restrict price promotions on HFSS \(high in fat, sugar and salt\) products in retail settings](#).

One novel approach to defining 'success' that was raised was that of 'imagination activism' – a process which involves asking more 'what if' questions, so that policymakers can think beyond the current status quo and work together to come up with innovative solutions to the problems they confront.

Absence of Robust Data

The problem that was raised throughout the discussion was the failure to secure consistent and comparable data across the public sector. One participant pointed out that the

components of [the index of public service productivity growth](#) in the UK, produced by the Office of National Statistics, are of mixed robustness. For some services, such as defence and policing, outputs are assumed to be equal to inputs. Other outputs in the index, however, are quality adjusted to consider what is delivered by what is spent.

Another participant raised the example of devolution in the UK. One rationale that was provided for devolution in the UK context was the potential to enable experimentation across the public sector from which central government can learn what works. This opportunity has been missed, however, due to an absence of inter-comparable data across England, Scotland, Wales, and Ireland. One participant suggested that devolved authorities could adopt the partnership model used in the agricultural ([EIP-AGRI](#)) and manufacturing ([EIT Manufacturing](#)) industries to pool innovation.

Another participant, however, raised the concern that despite devolution, piloting policy interventions is difficult because devolved authorities in the UK do not have enough autonomy to act without central Government input.

Summary and Next Steps

Participants identified six key takeaways from the discussion, which included:

- It is important to clarify what the business case for investment in innovation looks like and identify data on the benefits and impact of investment in innovation for the public sector, taking into consideration the fact this could look different at the local and national levels.
- Robust, consistent metrics and data, built in from the beginning of the process, are crucial to better understand the successes and impact of public investment in innovation.
- The public sector can use testbeds and living labs to build models at a systems level which can demonstrate success and failure; this data can then be fed into other models.
- It is important to find ways to incentivise and communicate failure within government and encourage risk-taking in order to combat a culture of risk-aversion in the public sector. Even within a massive system like government there will be

scales at which interventions can be piloted; downstream, this testing enables policy makers to spread best practice. However, enabling experimentation of this kind in the public sector will require behavioural change to combat risk-aversion.

- Public sector procurement means encouraging and enabling risk-taking within the public service. This might include scale-up risk on the supply side, and risk of failure on the demand side (for example, concerns about public sector procurement due to concerns about departmental adoption).
- Settling on clear, audacious goals and working backwards from there enables policy makers to determine what steps need to be taken to achieve these goals.

In line with these takeaways, the following next steps were proposed by participants:

- Commission and conduct primary research to probe barriers to innovation in the public sector
- Agree an outline programme of seminars that could be delivered by a joint IUK-CSaP partnership to build evidence, networks and momentum for questions around public investment in innovation