

Public Sector Productivity Review: Fifteen questions

Authors:

Nina Jörden

Bennett Institute for Public Policy

Lucy Hampton

Bennett Institute for Public Policy

Ayantola Alayande

Bennett Institute for Public Policy

Date:

March 2024

The Productivity Institute

Productivity Insights Paper No.030

Key words

public sector, productivity, local government

Authors' contacts:

nj362@cam.ac.uk

Copyright

© N. Jörden, L. Hampton, A. Alayande (2024)

Suggested citation

N. Jörden, L. Hampton, A. Alayande (2024), *Public Sector Productivity Review: Fifteen questions*, Insights Paper No. 030, The Productivity Institute.

The Productivity Institute is an organisation that works across academia, business and policy to better understand, measure and enable productivity across the UK. It is funded by the Economic and Social Research Council (grant number ES/V002740/1).

The Productivity Institute is headquartered at Alliance Manchester Business School, The University of Manchester, Booth Street West, Manchester, M15 6PB. More information can be found on [The Productivity Institute's website](#). Contact us at theproductivityinstitute@manchester.ac.uk

Abstract

In response to pressing challenges such as an ageing population and escalating tax burdens, both Jeremy Hunt and Michael Gove have underscored the imperative of enhancing public sector productivity. However, these endeavours often trigger concerns about potential drawbacks, including worries about service reductions, rushed processes, and unintended consequences.

This report posits that it is time to transcend the discourse centered on cost efficiency and embark on a more comprehensive evaluation of organizational productivity and efficacy. The primary aim of this report is to enrich the ongoing conversation surrounding public sector productivity by delving into various dimensions of the concept and into measurement methodologies. By elucidating the indispensable role of public sector productivity in our daily lives, the report advocates for a nuanced approach that acknowledges the significance of social value and quality improvements.

Moreover, the report focuses on specific strategies geared towards increasing productivity: digital transformation and human resources management. It elaborates on the manifold opportunities that originate from these domains and concludes each section with a set of probing questions that are deemed indispensable for steering future cross-governmental assessments of productivity.

Contents

Introduction	2
Part 1.....	4
Why is public sector productivity relevant?	4
Defining and measuring productivity in the public sector.....	7
Part 2.....	13
Productivity in practice: options to boost public sector productivity	13
Unlocking the Potential of Digital Transformation	14
Navigating Complexities in Human Resource Management	19
Conclusion.....	23
References	24

Introduction

The pressures of an aging population, a rising tax burden and increasing calls for tax cuts have put public sector productivity high on the agenda of Jeremy Hunt, the Chancellor of the Exchequer. The review, announced in June 2023, promises a "relentless focus on efficiency and innovation across the public and private sectors," starting with public services. It is estimated that 0.5% GDP growth is needed to stabilize the share of government spending in GDP. Otherwise, Hunt said, public sector debt could more than double to 217% of GDP by 2071. The programme will assess how to increase productivity growth in both the short and long term. The Chancellor of the Exchequer has called the review the "most ambitious" ever undertaken by a government.

Enhancing productivity within local government is also a top priority for Michael Gove, the Secretary of State for Levelling Up, Housing, and Communities. Alongside the announcement of £600 million in funding for local government, Gove emphasized the need for local councils to develop productivity plans. These plans should outline strategies to enhance service performance and minimize unnecessary expenditures, ensuring optimal utilization of taxpayers' money.

However, within the public sector, there is a certain level of unease and caution associated with the concept of productivity. Some individuals are hesitant as they connect productivity with cost-cutting measures and reductions in services.

The emphasis on terms like "wasteful spending" and "service performance" in Gove's statement, as well as the "rigorous focus on efficiency" in Hunt's announcement, raises the possibility that these plans may be an extension of the efficiency initiatives that local government has had to implement due to reductions in its core funding over the past decade (Garling, 2024).

Putting a sole focus on efficiency and cost savings comes with inherent risks, including compromised service quality, difficulties in retaining staff, and missed opportunities for innovation.

Indeed, this was the case following the Gershon Efficiency Review (2003/4), which was criticised in particular for leading to a decline in some services, notably through the loss of skills and expertise (Seager, 2007). One of the best known examples is the decision, based on the Gershon recommendations, to move the London-based Office for National Statistics (ONS) to Newport in order to cut costs. This resulted in a significant loss of ONS staff who did not want to relocate from London to Wales (Bean Review, 2016).

Drawing from this experience, we contend that the discourse surrounding productivity in the public sector needs to shift from merely emphasizing cost efficiency to encompassing a more comprehensive evaluation of organizational productivity and effectiveness. We exemplify this shift by examining its implications for digital transformation and HR practices. Our views draw on the evidence set out in the recent publication 'The Productivity Agenda' by Coyle et al (2023), which critically examines productivity in the UK. This agenda emphasises the urgency

of implementing productivity-enhancing measures across the economy. Factors contributing to sub-optimal productivity include underinvestment, particularly in infrastructure, unproductive practices in small and medium-sized enterprises, inadequate allocation of resources to research and development, challenges in translating research findings into commercial success, limited competition in certain markets and a skills gap in the labour force. We build on this discussion by examining the public sector productivity issues discussed in Chapter 8 of the agenda in more detail in this paper (Van Ark et al. 2023).

The paper is divided into two sections. First, we address the fundamental aspects of public sector productivity by examining its significance, outlining the key parameters and exploring possible methods for measuring it.

The following section looks in more detail at two key areas offering promise for increasing productivity: digital transformation and human resource management. These aspects are both of immense importance to achieving the goals of the comprehensive, cross-government review of public sector productivity. Within both themes, we pose a series of open questions which have been under-researched so far. In particular, these questions aim to broaden the discourse by incorporating concerns and viewpoints that go beyond the realm of pure efficiency and cost reduction.

By exploring the multiple dimensions of public sector productivity, this report aims to contribute meaningfully to the debate about how to increase public sector productivity. It is also intended to provide researchers and policymakers with a series of questions that prompt further exploration.

Part 1

Why is public sector productivity relevant?

The productivity performance of the public sector is crucial because government plays a significant role in the economy – through the provision of essential services such as health, education, public security and infrastructure and the governance and maintenance of social institutions, as well as by facilitating an enabling environment for private sector growth. This role is essential for raising living standards for citizens and drive innovation – as well as to provide value for money.

Public sector activities encompass immediate, discernible effects—like delivering fundamental services such as education, healthcare, and law enforcement—and associated costs such as taxes and fees. But they also yield more nuanced outcomes, like fostering employment opportunities, ensuring economic stability, and enhancing societal well-being. Despite its multifaceted impact, the significance of the sector's productivity often goes undervalued in public discourse.

In the UK annual government expenditure has averaged at least 40% of GDP since 2008, two thirds of which is spent on public service provision. In the fiscal year 2019-20, the public sector accounted for 22.5% of GDP, or £7,600 per capita at that year's prices (Ogden & Phillips, 2023). The UK public sector employs around 17% of the UK workforce (Francis-Devine & Powell, 2023).

Provision of public services

A comprehensive approach towards measuring public sector productivity first requires recognising the various ways in which government efficiency and effectiveness impact on society.

The public sector is responsible for providing public services. This includes a wide range of basic services such as health, education, transportation, law enforcement and social welfare. Improving productivity in the public sector can therefore help ensure that these services are delivered efficiently and effectively, which is critical to meeting citizens' needs and expectations.

Public service provision is also a dynamic concept, since government typically consists of various interdependent but structurally different and complex units. The literature (e.g., Dunleavy, 2021) delineates the responsibility of who provides what services depending on their purpose, using the 'optimal allocation model': *unitary policy goals* (i.e., services assigned to national governments) and *local policy goals* which are specific to local governments or municipalities. In this distinction, national governments are assumed to only take on top-level service delivery functions that apply to the wider population.

An alternative service-based model (Peterson, 1981) divides public services into three: allocative services which are paid for and used by the same group of people in a given locality;

redistributive services which are funded through progressive taxation and generally targeting the less affluent part of the population); and developmental services which are funded through government subsidy of private sector providers.

Such complexity in describing public service provision suggests that productivity in the public sector cannot be easily defined or measured. For example, there are numerous ways to assess performance indicators for service delivery, including the accountability, accessibility, responsiveness, reliability, competence, and safety of each service. Consequently, what constitutes productivity in the public sector is in the eye of the beholder. It depends on the view of policy makers; whether it is assessed in terms of how well services achieve the intended goals and how satisfied service users are with the outcomes; or whether the focus is rather on the aspects of quantity, efficiency and resource use in the delivery of services.

The quality of public service delivery also tends to vary between regions or local authorities. By improving public sector productivity at the national level through better coordination between national and subnational authorities, locally tailored service delivery and a unified response in emergencies, can promote subnational economic growth and reduce regional inequalities. This explains why the 'levelling up agenda' has become a key public sector objective in the UK (Zymek & Jones, 2020; Westwood et al., 2021). Despite regional differences in service quality, it is recognised that focusing on local government could be an effective way to increase overall public sector efficiency and could make a significant difference to tackling many of the funding pressures public service providers face. While local government may appear limited in scope, it has the potential to have a significant impact on the efficiency and effectiveness of the public sector as a whole.

Efficient use of resources

Another important task of the public sector is to ensure the efficient use of resources. The public sector is funded by taxpayers' money and is responsible for ensuring that the money is used efficiently and effectively. In the UK, factors such as an ageing population and rising expectations of public sector delivery are putting pressure on public finances. In addition, with a shrinking labour force, the government has to confront Baumol's "cost disease" (Baumol & Bowen, 1966), whereby wages face upward pressure to grow in accordance with the private sector without corresponding increases in public sector productivity, leading to a greater burden on the government budget.

Some cost pressures could be alleviated by deploying resources to prevent issues rather than addressing them retroactively. For instance, many health interventions in prevention, such as smoking cessation services, have been found to be cost-effective and some have been found to be cost-saving (NHS Health Scotland, 2016). However, in a broader sense, the persistent combination of cost pressures and increasing demand places ongoing strain on public services. Due to the difficulty in prioritizing among various service areas, resources often become thinly spread.

A few important points on the efficiency of public service provision are worth noting. First, the concept of efficiency in public resources is not only limited to cost minimisation, it also includes efficiency in where resources are allocated. In this sense, efficiency in resource

management could be subdivided into two concepts: *technical* efficiency and *allocative* efficiency, as per Aldridge et al. (2016). Technical efficiency is achieved when the maximum output is achieved with a given input, holding prices constant. It involves evaluating the effectiveness of the production process and ensuring that it is streamlined and resource wastage is minimized. Allocative efficiency is achieved when a technically efficient point is chosen that is also socially optimal, in the sense that marginal social benefit is equal to marginal social cost. This type of efficiency considers not only the internal efficiency of the production process but also the broader societal impact and value derived from the allocation of resources. Allocative efficiency is concerned with ensuring that resources are distributed in a manner that maximizes overall societal welfare, considering the relative costs and benefits (both private and public) associated with different resource allocations (see Mandl et al., 2008, pp.3-4).

As Mandl et al. (2008) point out, however, there are several problems with the application of the economic concept of allocative efficiency in a public sector context. Firstly, measuring allocative efficiency requires knowledge of prices as proxies for marginal social benefits and costs. However, market prices are unavailable in the public sector, and there are issues with inferring these from the prices of similar services in the private sector (Van Ark, 2022). There are also complications arising from interlinked nature of the public sector, as adjusting the inputs and outputs of one service can affect the inputs and outputs (and therefore allocative efficiency) of other services. Thus, here we prefer to use the concept of effectiveness to capture the connection between outputs and socially desirable outcomes, rather than the economic concept of allocative efficiency, and we use 'efficiency' to mean maximising output for a given budget.

Research also highlight the compatibility of efficiency and effectiveness within the public sector. For instance, enhancing effectiveness, such as streamlining procurement processes through digital innovations, enables authorities to optimize existing resources like limited labour, reducing bottlenecks and resulting in cost savings and improved value for money. Additionally, stricter government spending oversight can yield greater social benefits with fewer resources, as noted by van Ark (2022). In order to increase both efficiency and effectiveness, we argue that it is essential to view the public sector as a dynamic, interconnected system. It is crucial to underscore the interdependence and feedback loops among the various components of the public sector and its diverse services. For instance, entities like Department for Levelling Up, Housing and Communities (DLUHC) exhibit more cost-effective strategies in addressing homelessness, by ensuring individuals leaving prisons or the care system have secure housing or providing tailored drug and alcohol addiction services. In addition, Department for Science, Innovation and Technology (DSIT) interventions to drive innovation in the economy will be more effective with a higher-skilled workforce.

Fostering citizens' trust

Improving productivity in the public sector also helps to increase citizens' trust in government. If citizens see that taxes are being used efficiently and that public services are being delivered effectively, they are more likely to trust and support government. Numerous studies have

shown the positive correlation between quality delivery of public service and citizens' trust in government (see for example, Kampen et al., 2003; Beerli et al., 2019; Nawafleh, 2020). This suggests that the efficient use of resources also promotes accountability and transparency. Clear mechanisms for tracking and reporting resource allocation and utilization can help deter corruption, promote good governance, and hold public officials accountable for their decisions. This, in turn, fosters transparency and public trust in the governance process.

The relationship between citizens' trust and public sector performance is bidirectional. While many studies have argued that citizens' level of trust in government is a product of the quality of public service delivery, Van de Walle and Bouckaert (2003) posit that poor level of trust in government itself could produce negative perceptions of public sector performance.

The spread of (un)trustworthy opinions could thus be a key factor. Research on service delivery in the private sector has shown that 48 percent of dissatisfied customers will not use the service again and 32 percent will actively discourage other from using the service in the future (Johnston, 1998). Stories and myths about the administration should also not be underestimated: Certain stories, so-called "urban legends", can have a significant influence on opinion formation. As a consequence, once such a "culture of mistrust" exists, performance does not always matter. By that moment, perceptions of government become theory- rather than data-driven. Or in other words, negative attitudes towards government seem to be self-confirming, while good performance is simply no longer noticed (Augoustinos & Walker, 1996)

While citizens frequently lack alternatives regarding public sector services, their trust in the government's capacity to deliver such services significantly influences their willingness to financially support them. This underscores the necessity of enhancing social capital between citizens and public service providers, particularly at the local level, as a crucial step towards enhancing productivity within the public sector (Oh & Hong, 2014).

Defining and measuring productivity in the public sector

The core definition of productivity is the amount of output produced relative to the inputs used. Labour productivity, for example, measures the ratio of output over labour inputs, where labour inputs may be defined in terms of the number of workers or total hours worked. The quantity of labour inputs may be adjusted for the mix of workers using measures of skill levels. Total factor productivity (or multi-factor productivity) measures the ratio of outputs over total inputs, including both labour and capital as well as other inputs (if data are available) such as energy, materials or land. In public sector organisations that contract out certain inputs such as staff, both in-house and outsourced inputs may be included (Dunleavy, 2021).

The measurement of public service productivity is harder than in the case of the private sector because there are no market prices for outputs (and often even not for inputs), and because it can be hard to distinguish service outputs (e.g. healthcare services) from the broad outcome (e.g. population health). Up to 1998, productivity in public services in the UK was measured by a simple 'outputs = inputs' approach, assuming that the number of employees

and the cost of employment is a measure of output, which implies zero productivity growth. Following the Atkinson Review in 2005, whose recommendations aimed to make public sector productivity measurement more consistent with the private sector (Heys, 2019), a wider range of direct output measures have been incorporated for certain services. Even so, 40% of public sector services, including for example all policing, justice and defence services, are still measured on an 'input = output' basis (van Ark, 2022).

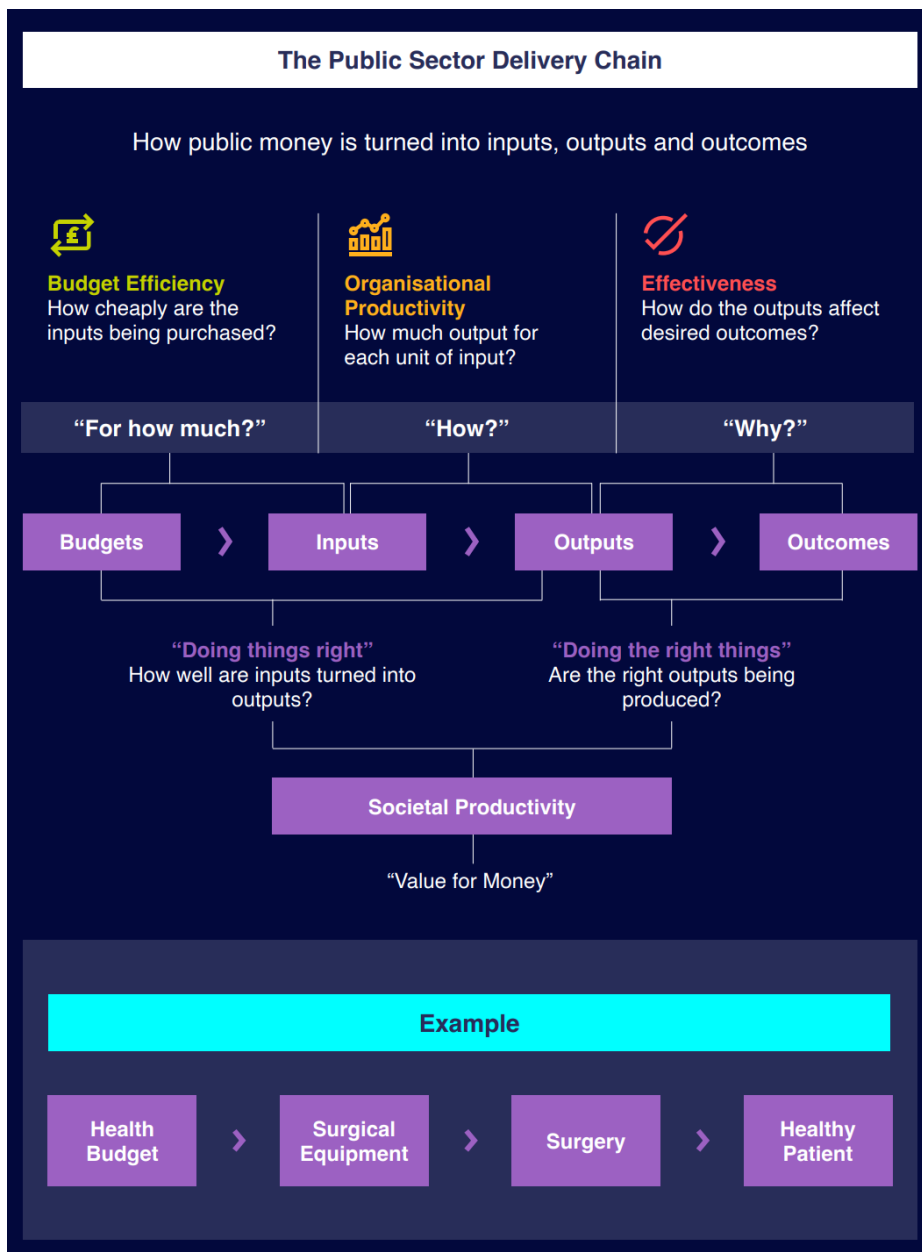
In his statement on the comprehensive review of public sector productivity the Chancellor, Jeremy Hunt, acknowledged the challenges associated with measuring productivity in the public sector, and expressed the intention to explore strategies to improve this assessment process. While this is an important endeavour, it is anticipated that the effort will face difficulties due to the lack of important data sets in certain areas. Developing new data sets that adequately cover the full range of services offered is likely to be a time-consuming endeavour. It is therefore particularly encouraging that efforts are nevertheless being made to extend the ONS survey of the quality of public service management. Whether the Office for National Statistics (ONS) can make these changes depends on their ability to cover a wide range of time periods and sectors comprehensively. Additional data sets from third parties, including data on public sector management, are being considered as a viable solution. However, these additional data sets are often characterised by fragmented and incomplete information, which poses another challenge to the assessment process.

In fact, the nature of the public sector itself poses several productivity measurement challenges. First, the identification of outputs may be difficult. In some public sector functions like defence, for example, it is preferable that certain outputs are not realised. In this case, outputs must be defined carefully so that increasing the production of 'bad' outputs does not boost measured productivity. This might be done by using an activities-based definition of output, such as training runs or patrols, although caution must be exercised to distinguish those activities – focused on prevention – from inputs – focused on realising the outputs if needed – (Dunleavy, 2021). The quantification of teaching hours, for example, is a measurable educational activity (Simpson, 2009). However, the key consideration is not necessarily whether this is an educational input or output, but rather how effective the number of teaching hours are in relation to the intended goals (such as student learning or preparation for employment).

Excluding certain outputs may also bias the measure of productivity. Failing to include preventive activities is one of such examples. The ONS measure of the productivity of fire services includes the number of incidents attended by the fire services as an output, as well as the staff hours spent on fire prevention activity (ONS, 2023). Failing to include the latter would bias productivity in favour of fire services that neglect preventative activities and consequently have more incidents to attend to (Dunleavy, 2021; Gerlach, 2021). However, there is often a lack of linkage of datasets between public sector organisations in order to map prevention measures adequately. Recent research in South Wales, for example, has shown that the successful linking of data sets between police and health services improves the chances of preventing domestic violence or mitigating serious health consequences (Kennedy et al., 2023).

A second problem is that public sector organisations primarily serve the public interest, a broad and multidimensional goal, while the private sector primarily seeks the narrower and relatively easily measurable goal of profit (although the increasing importance of environmental, social, and governance (ESG) has led to a somewhat greater alignment in the pursuit of broader goals by the private sector). In this regard, it is appropriate to distinguish between fiscal efficiency, organisational productivity, and effectiveness, each referring to different parts of the public sector service delivery chain (van Ark, 2022). Efficiency is about how cost-effectively inputs are purchased, organisational productivity is the output produced with each unit of input, and effectiveness is about how outputs achieve socially desirable outcomes. Drucker (1963) expresses the difference between efficiency and effectiveness as 'doing things right' versus 'doing the right things'. In education, for example, effectiveness might be about how a given level of GCSE attainment translates to future earnings, or in healthcare it might be about how given procedures affect life expectancy or quality of life.

The image below, from van Ark (2022), shows the value chain of public service delivery – from budgeting to outcomes, using the example of the healthcare sector.



Source: van Ark, 2022

While public discourse often emphasizes the first element, budget efficiency, for defining public sector productivity, it is essential to take all three dimensions into account. Failing to do so can lead to unintended consequences, such as pursuing objectives without observable outcomes. It's not a matter of prioritizing one aspect over another but recognizing that all three dimensions must be considered to achieve meaningful results in the most cost-effective manner. Nevertheless, measuring the entire supply chain's performance is often a challenge.

For instance, when a policymaker seeks to gauge the impact of a productivity-enhancing measure, there may be a time delay between implementing the measure and observing its effects on social goals. In such cases, assessing the measure's effectiveness may be infeasible if the timeframe does not encompass long-term impacts. An illustration of this is the assessment of how school education influences later career decisions or quality of life.

Another challenge lies in the fact that effectiveness can be influenced by factors beyond the control of the public sector organisation, such as economic conditions affecting educational outcomes in schools. This can potentially lead to a misleading assessment of a public sector organization's performance (Carrera & Dunleavy, 2010). Interdependencies between various public sector organizations can also impact the effectiveness of specific measures and activities. For example, police productivity can be severely hindered by the NHS's performance in treating patients with mental illness or by issues within the court system that result in unresolved cases.

Even if, for practical reasons, it is not possible to take the outcomes into account in the productivity calculation, it is still important to account for quality change in the outputs. For example, a technological improvement may make a medicine more effective in treating disease over time or reduce side-effects. Improvements in accessibility, such as ease of online booking of a hospital appointment, also contribute towards improved service quality. Quality can be understood here as the marginal private valuation of the output. In the private sector this is proxied for using the price, since competitive pressures mean that the marginal willingness to pay is equal to the price in equilibrium. Distinct outputs can then be aggregated together into a single output index using prices as weights to reflect their relative economic importance.

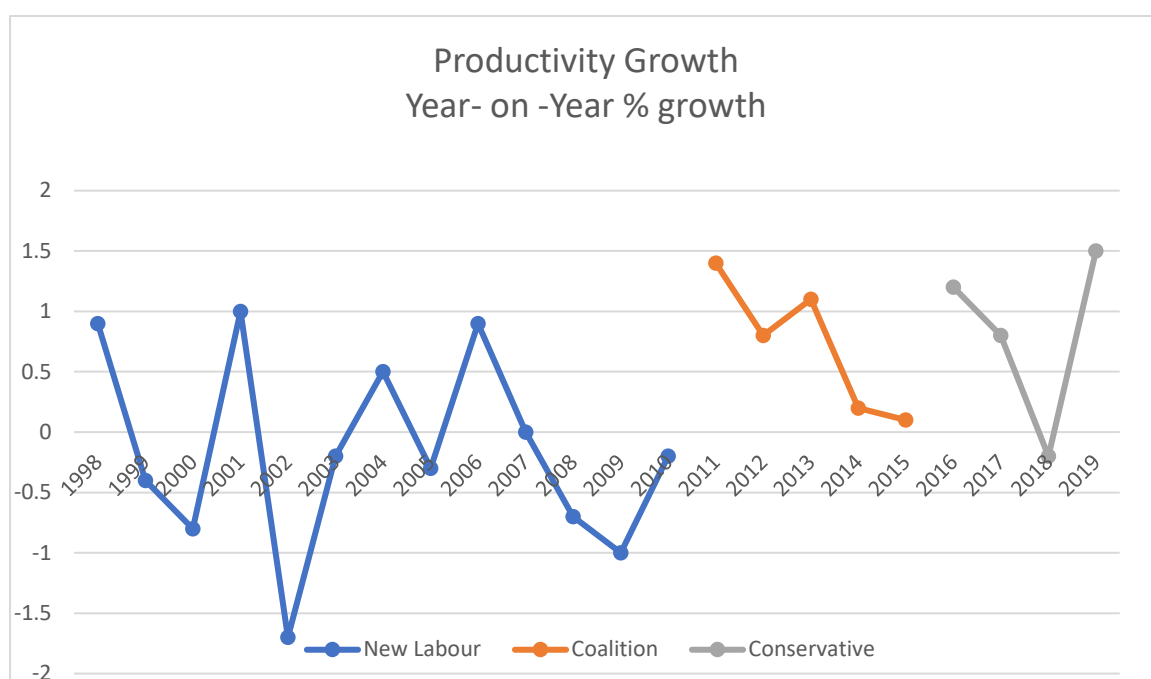
One approach to quality adjustment is to assume the same level of unobserved quality in each provider of the same type of service (Førsund, 2013). Another is to assume that quality improvements are reflected in cost increases. If costs are used to weight volumes of different outputs, then a shift from a cheaper towards a more expensive type of output will lead to an increase in the output index (Atkinson, 2005). However, this will not be appropriate for technological change that simultaneously improves the quality of services, and reduces its cost. In these cases, it may be possible to construct direct quality indices consisting of quantitative measures of performance. In healthcare, for example, measures such as post-operation survival rates, complaints data, re-admission rates or regulator ratings may be used (Blank & Valdmanis, 2013; Dunleavy, 2021). The choice of weights can also lead to measurement difficulties when the mix of activities changes, as happened during the pandemic when critical care and vaccinations became more important (Coyle *et al.* 2021).

In the UK, since the Atkinson Report (2005), subsequent governments have taken steps to support better measurement of public sector performance, including quality adjustment for several services such as health. One measure was the establishment of the UK Centre for the Measurement of Government Activity (UKCeMGA), which is responsible for measuring the productivity of several public services and agencies. Although the UKCeMGA no longer exists as a separate government agency, the Office for National Statistics (ONS) has taken on the task of regularly reporting on government input, output and productivity measures for nine different government functions, namely: adult social care, children's social care, defence, education, health, police, public order and safety, social security and administration, and other government services (e.g. housing, recreation, environment, etc.).

Partially influenced by the recommendations of the Atkinson Review (2005), the ONS began integrating direct quality measures into the national accounts for certain services starting in

2015. This has had a notable impact on the recorded public sector productivity. Notably, between 2010 and 2017, quality enhancements played a substantial role, contributing to more than one-third of the annual 0.7 percent growth in public sector productivity (van Ark 2022; ONS, 2023).

It's worth noting that the significance of quality improvement was even more pronounced during the 1990s and 2000s, which signifies a shift from a stronger emphasis on quality improvement during the New Labour era to a focus on efficiency gains in terms of quantity under the Conservative government. However, overall productivity growth, in terms of both quantity and quality, was better during the later period (excluding the 2020 data, which was significantly skewed by the pandemic) (ONS, 2023).



Despite significant progress made in standardising and enhancing productivity measurement in the public sector, the determinants of the sector's productivity remain hard to gauge. First, the difficulty of measuring outputs and quality means that evidence is often partial, focusing on some but not all the outputs of an organisation. Second, even when private sector organisations with similar outputs as the public sector exist, the effect of the same intervention may vary due to different organisational structures and constraints, for example in budgeting and staff renewals (Simpson, 2009). This means that evidence from the private sector cannot be directly applied to the public sector. Third, it is difficult to assess the cause-and-effect relationship between policy measures and public sector productivity because there are few comparative cases, especially among central government agencies. One possible approach could be to complement one's own data set with information from other countries to enable international benchmarking and increase the reliability of one's own

analysis. Finally, as discussed before, productivity improvements, even when identified correctly, may come at the expense of effectiveness.

Part 2

Productivity in practice: options to boost public sector productivity

Nowadays governments around the world acknowledge the importance of improving productivity in the public sector to mitigate the decline in productivity growth across the whole economy. However, the question remains how can productivity be improved in public sector organisations? There are a number of approaches. We focus on two: digital transformation and human resource management.

Digital transformation is a critical catalyst for driving continuous innovation in the public sector and offers the potential to simplify, optimise and enrich the delivery of products and services. In addition, organisations can increase their operational efficiency through for example digital platforms, freeing up scarce human resources for frontline services.

Despite those potential benefits, only a minority of organizations, mostly in the private sector, have managed to leverage digital innovation to distinguish themselves positively within their industries. Conversely, especially in the public sector there appears to be a higher prevalence of unsuccessful IT projects compared to those that can showcase tangible productivity gains.

According to Coyle (2023), the effective implementation of digital technologies hinges primarily on factors such as cost, skills, and data adoption. She contends that critical elements in this context encompass the necessity for complementary investments and the difficulty of reorganizing production and delivery processes to adopt innovation. Coyle also points at distinctive characteristics of the digital revolution. Notably, companies heavily invested in digital technologies allocate more resources to work practices like team collaboration, broader distribution of decision rights, and increased worker training. These firms are also more inclined to collect and utilize data, impacting their overall performance.

To shed light on these complex relationships between digital technology and productivity, we explore the potential of digital transformation in the public sector through a case study of a digital cooperation and collaboration platform. Through this exploration, we aim to uncover not only the promise, but also the challenges and complexities that digital transformation brings to the public sector.

Next, we look at human resource management practices in the public sector. The public sector has unique characteristics that distinguish it from the private sector requiring a nuanced approach to human resource management. The pressure to adopt private sector models, driven mainly by the New Public Management approach, has offered both opportunities and difficulties for human resource management in the public sector. We will explore the

complicated dynamics of motivation, incentives, performance management and accountability, all of which are central to the pursuit of improved productivity and service delivery in the public sector. We will also examine the potential tensions and trade-offs between quantitative and qualitative performance management.

We conclude this part of the study with a list of questions that we believe should be addressed in a future cross-governmental studies of productivity.

Unlocking the Potential of Digital Transformation

Digital transformation plays a pivotal role in fostering ongoing innovation within public sector organizations. Technologies have the potential to simplify, optimize, and enrich the delivery of products and services. Moreover, digital tools can bolster productivity in the operational aspects of service delivery, for example by facilitating shared service centres and the use of digital platforms. This then allows for the reallocation of scarce human resources toward frontline services. Despite the undeniable advantages of digital technology, there is also a good deal of scepticism regarding its use in public sector operations.

This scepticism is fuelled by the long list of unsuccessful IT projects within the public sector—projects that either failed to provide the expected value for the investment, often due to budget overruns and delays, or projects that were never materialized. The NHS National IT Program (NPfIT) is a prominent example of a failed project. Originally planned with a budget of around £6 billion over the life of the contracts, the program suffered a series of setbacks, including persistent delays, stakeholder opposition and implementation problems. In 2011, the Conservative-Liberal Democrat government finally decided to cancel the project. The decision came nearly a decade after Prime Minister Tony Blair had launched it in 2002 with the aim of improving access to health information for the benefit of patient care, wherever and whenever it is needed.

The Case of ResilienceDirect

Our focus here is not on the unsuccessful projects, but on efforts such as the "ResilienceDirect" digital platform, which has improved the overall effectiveness of a public service (for a detailed study, see Sage et al. 2022).

In 2014, the UK Cabinet Office introduced ResilienceDirect as a platform designed to foster cooperation in preparing for, responding to, and recovering from emergencies. ResilienceDirect offers a secure digital framework that allows emergency responders to exchange information and establish a unified understanding of the situation. The need arises from the substantial variation at the local and regional levels in how emergency planning and response are organized and funded within the UK. Additionally, agencies in different regions contend with differing types and frequencies of multi-agency emergency incidents. Consequently, the utilization of ResilienceDirect and the nature of collaboration have consistently displayed marked distinctions across regions.

Collaborative efforts have long been acknowledged as a challenge in multi-agency emergency operations. Public assessments of past emergency responses in the UK, such as the 2005 London bombings, the summer 2007 floods, the 2017 Grenfell Tower fire, and the 2017 Manchester bombings, have repeatedly emphasized enduring issues in coordinated actions among emergency responders. Often, the underlying causes of these inter-agency shortcomings, ranging from technical compatibility to operational culture, only surfaced after the operations were concluded.

The rising occurrence of crises that transcend both physical and technological boundaries, exemplified by the case of Covid-19, underscores how such crises can propagate through these systems in increasingly complex ways that defy advance prediction. Consequently, the emergency response must also evolve to become more intricate and adaptable in order to effectively address the unique progression of emergency events. The escalating complexity of crises inevitably demands cooperation among numerous organizations. These extensive "collaborative networks" place added pressure on emergency services, various government levels, and other service providers to coordinate and supervise the multifaceted response efforts.

Technological solutions like ResilienceDirect have become essential for fostering collaboration among organizations. Throughout the Covid-19 pandemic, nearly all entities underwent a significant transformation in their utilization of technologies such as Microsoft Teams and Zoom. These platforms proved vital in sustaining collaborative efforts amidst the social restrictions imposed by Covid-19. Technologies harbour substantial potential to enhance emergency collaboration by elevating the quality of information and facilitating shared situational awareness. This in turn bolsters the speed, sustainability, and effectiveness of response efforts.

Research focused on emergency collaboration underscores that technology's role in information sharing is particularly pivotal when specific conditions are met. These conditions include user-friendly technology, seamless integration into daily routines, and equitable information sharing among all partners involved (Bharosa et al., 2010). Customizable interfaces can empower these systems to accommodate the diverse cognitive problem-solving approaches of their users. Such adaptability assists users in managing information overload and enables on-the-fly adjustments when responding to unpredictable and intricate events.

Broader research pertaining to technology use within organizations elucidates that technologies are effective and valuable when they align with user needs and evolve to maintain user engagement (Callon, 1986). This principle arises from the realization that user needs evolve, and technology's capabilities increase over time. In essence, technologies should not be perceived merely as static tools designed to address fixed problems, such as information sharing and collaboration. Instead, technologies should continuously adapt and evolve to ensure that they incorporate changes in how users frame and approach these issues.

The case of ResilienceDirect serves as a compelling illustration of how digital platforms can markedly enhance the efficiency of public services, particularly in emergency response and coordination. When technology is appropriately deployed, it can elevate information quality, promote a shared understanding of the situation, and ultimately expedite the speed, sustainability, and effectiveness of relief efforts.

Lessons learned

Viewing technology as dynamic and ever-changing implies that a mere plan or policy document is insufficient to guide digital transformation. Equally vital are conversations, negotiations, and dialogues on how to embrace and adapt to new opportunities. It's crucial to acknowledge that diverse viewpoints and conflicting objectives will arise, such as the tension between efficiency and job preservation, innovation and stability, or cost reduction and investment. Individual goals may also clash with the overarching organisational vision. Consequently, organisations need to adeptly balance and address these goals to ensure the success of digital transformation projects (Dunleavy et al., 2006).

Despite the considerable potential for success, a comprehensive examination of the frequent failures and sub-optimal outcomes of digital projects and technology implementations in the public sector is essential. Rather than attributing these challenges to a singular cause, it appears that numerous interconnected factors hinder digital innovation and impede the realization of measurable productivity gains.

- **Extended adoption time**

Experts suggest that the implementation of cutting-edge digital technologies, particularly artificial intelligence (AI), necessitates a more strategic and deliberate or systemic approach (van Ark & Hoskins, 2004). The intricacy of these technologies and their high fixed costs contribute to a gradual rollout, deviating from the timelines of their predecessors. The intricate process of transforming digital concepts into economically beneficial innovations takes time, posing risks of the project becoming outdated or misaligned with evolving organizational needs. Sustaining high levels of effort and motivation over an extended period becomes challenging, and stakeholders may lose interest, leading to diminished support.

Analysing different diffusion patterns is useful in this context. The well-known S-shaped diffusion pattern (Geroski, 2000) illustrates, for example, that the adoption of a new technology starts slowly, gains momentum and finally stabilises. The extent of technology spread before slowing down depends on factors such as cost structure and the strength of network effects (Acemoglu et al., 2011). Recognizing this pattern is crucial for understanding the journey of digital technologies from introduction to widespread adoption.

However, merely adopting a new technology does not guarantee realizing value. The 'J-curve of productivity' visually represents this phenomenon, indicating that there might be an initial dip in productivity during a digital transition (attributed to increased investment in complementary assets like data, skills, management, and organizational improvements). This dip may be followed by a rebound, contingent on the return from the additional investments made (Brynjolfsson et al., 2021).

- **Need for organisational change**

The crux of most digital transformations lies in organisational change (Brynjolfsson et al., 2002). Skills development, particularly in addressing the persisting scarcity of expertise in domains like software engineering and data science, emerges as an indispensable component for unlocking the holistic potential of digital technologies. Consequently, there is a need for substantial investments in training programs and initiatives focused on skill development to empower employees with the necessary capabilities for the effective utilization and management of the new technology.

In the initial phase, companies frequently encounter the challenge of managing internal reorganization, involving the restructuring of hierarchical setups, reallocation of decision-making authority, and fostering extensive networks for facilitating the smooth exchange of tacit knowledge. The introduction of digital technologies may also trigger a reassessment and overhaul of existing processes. These broad organizational adjustments play a pivotal role in guaranteeing the complete realization of the transformative capabilities of digital technologies.

Nevertheless, the necessary change typically extends beyond structural modifications; it is primarily cultural. This entails employees embracing new approaches and adopting a mindset conducive to digital readiness. It involves cultivating an agile culture that enables the organisation to swiftly adapt to evolving circumstances. Additionally, fostering a positive attitude towards the adoption of technology and instilling a sense of ownership in the transformation process are vital aspects. Equally crucial is the development of a data-centric culture, ensuring that decision-makers throughout the organisation depend on data insights to guide their actions.

- **Well-defined data policies**

The efficient utilisation of data plays a pivotal role in unlocking the complete potential of digital initiatives and has a significant impact on various facets of governance, service delivery, and overall organizational efficiency (Bjerde and Demirgüç-Kunt, 2021). Data, in particular, serves as a valuable asset capable of providing insights, aiding decision-making processes, and optimizing operational workflows. One example of this is Transport for London's publicly available transport usage data, which Deloitte estimates brings annual benefits and savings of up to £130 million to London's economy (Deloitte, 2017). This accessibility enables private developers to create innovative applications, allows TfL to capitalise on external innovation, and offers entrepreneurs and start-ups the opportunity to develop new business areas, contributing to economic growth and job creation.

Yet, the effective use of data frequently lacks a cohesive data policy. Such policies are pivotal in establishing clear guidelines for data collection, storage, access, and sharing. In the absence of well-defined and universally accepted data policies, challenges arise, particularly in the domain of data sharing between different agencies. When there is a lack of consensus on data sharing practices, the potential benefits of shared information are compromised. Agencies may operate in silos, hindering the seamless exchange of data that could otherwise contribute to more comprehensive insights and improved decision-making.

Furthermore, navigating data policies involves addressing issues of privacy, security, and ethical considerations. Establishing a framework that ensures the responsible and ethical use of data is paramount, instilling public trust and confidence in the government's handling of sensitive information.

- **Impacts of IT outsourcing**

Further complicating the landscape of digital transformation in the public sector is the prevalent practice of massive outsourcing of IT services. While this approach is often perceived as a means to achieve efficiency gains, the reality unveils a multifaceted challenge that warrants careful consideration. Notably, outsourcing constitutes a substantial chunk of public spending, with statistics indicating that around 31.73 per cent of total public spending in the UK for the 2017 financial year was allocated to contracting out services, slightly exceeding the OECD average of 30.45 per cent.

The noteworthy case of Carillion's collapse in 2018 serves as a stark reminder of the potential pitfalls associated with extensive outsourcing. Beyond the immediate financial ramifications, the incident underscored the susceptibility of organizations to external dependencies and the subsequent risks to their operational resilience. The aftermath of Carillion's demise raised concerns about the broader impact on digital transformation initiatives within the public sector. It became evident that excessive dependence on external resources could impede organizational flexibility and hinder the agility to swiftly adapt to changing circumstances and navigate the intricacies of digital integration (van Ark, 2022). Moreover, the depletion of internal expertise has resulted in authorities being less well-informed as clients of outsourcing, thereby heightening dependency.

Nevertheless, despite the multitude of challenges and the prevailing narrative suggesting the public sector's incapacity to handle digital transformation, there are encouraging indications that the situation is not as grim as commonly depicted. One crucial factor fostering this optimism is the enduring belief among experts that the productivity gains from digital technologies might be consistently undervalued.

A compelling example supporting this perspective is the revision of the telecoms services price index in the UK (Abdirahman et al., 2020). This revision implies that the falling costs associated with using digital technologies, particularly in the telecommunications sector, might not be adequately reflected in official measurements. A similar exercise performed on the cost of computing power found similar results (Coyle and Hampton, 2023). The implications of this discrepancy extend beyond mere statistical adjustments. They suggest that the tangible benefits of digital technologies, such as increased efficiency, cost-effectiveness, and improved services, might be more pronounced than acknowledged. The potential undervaluation of these benefits in official measurements underscores the complexity of accurately quantifying the impact of digital innovations on productivity.

Given the potential that technology and digitisation offer for the public sector and the lessons learned from past experiences, enhancing public sector productivity requires consideration of the following eight questions:

1. What is the long-term impact of technology adoption and digitization on public sector productivity, particularly in terms of continuous innovation and optimization of service delivery, when it has succeeded?
2. How can data generated through digitization be accessed and used effectively to improve public sector performance, support evidence-based decision making, and drive innovation and productivity across the economy?
3. How can a data policy be designed to enable data sharing between different authorities?
4. What lessons can be learned from specific case studies, such as the Covid-19 response, in terms of the impact of technology adoption on different units or departments within the public sector?
5. What is the impact of digitization on the quality and efficiency of service delivery in the public sector, and are there variations in outcomes between services or functions that extensively embrace digital transformation and those that do not?
6. What is the long-term impact of outsourcing on public sector cost savings, and at what point do outsourcing cost savings plateau or decline?
7. What are the potential risks and challenges associated with outsourcing public services to the private sector, particularly in terms of quality, accountability, and public perception?
8. How can we tackle the complexity of accurately quantifying the impact of digital innovation on productivity?

Navigating Complexities in Human Resource Management

The importance of effective human resource management is a critical factor in increasing productivity. Numerous studies have underscored the contribution of human resource management to organizational performance, which translates into increased productivity, increased profitability, and lower turnover rates (Arthur, 1994; Combs et al., 2006; Van De Voorde et al, 2010). It is important to note, though, that this research has focused predominantly on the private sector.

However, the significance of HR management in the public sector may surpass that in the private sector, primarily due to challenges such as resource constraints and increased scrutiny for accountability that public organizations often encounter. In the following, we will analyse the specific complexities of human resource management in the public sector. We will examine the lessons learnt from the private sector and identify areas where tailored measures are essential for effective HR management in the public sector.

The rising incorporation of HR best practices from the private sector can be attributed to the escalating challenges confronted by public sector organizations. For example, following the Covid-19 pandemic, healthcare organisations placed greater emphasis on the wellbeing and resilience of their staff. It became generally clear that addressing burnout, providing training and fostering a supportive work environment are essential measures to effectively manage the ongoing demands on healthcare staff (Haque, 2021).

However, the evidence suggests that not all private sector HR practices are suitable for implementation in public institutions. This is primarily due to the nature of the services provided, specific characteristics of the public sector workforce, and the responsibility of public organisations to be transparent about their expenditure of public funds (Kalleberg et al., 2006). Empirical findings suggest that while many public organisations have adopted a range of HR practices aimed at improving skills and opportunities (e.g. training and development, job rotation or flexible work design), they are less likely to adopt practices that specifically improve motivation (e.g. incentives, autonomy, promotions) (Boyne et al, 1999; Kalleberg et al., 2006; Vermeeren, 2014). This is not particularly surprising, as motivation-enhancing practices that are effective in the private sector are more difficult to apply in the public sector:

- Public sector organisations are accountable for the use of taxpayers' money, which may limit the implementation of certain motivation-enhancing practices. For example, providing large financial incentives or bonuses to public sector employees may be viewed by the public as a waste or inappropriate use of public funds.
- Public sector organisations often operate on limited budgets and often face budget cuts, making it difficult to allocate resources to large-scale motivational programmes such as financial rewards.
- Public sector employment is often subject to civil service rules and practices that can limit flexibility in hiring, promotion and compensation. These rules are designed to ensure fairness, prevent nepotism and ensure transparency in human resource practices. The notable influence of trade unions in the public sector is an additional factor. While not inherently counterproductive, it undeniably affects the dynamics and pace of change.

However, numerous initiatives aimed at enhancing public sector productivity centre around performance management strategies, where the fundamental use of incentives as a motivational tool is emphasized.

Nonetheless, employing incentives in the public sector faces challenges due to the following issues:

- Public organisations, by their very nature, serve a variety of different stakeholders (central government, citizens, service users, local politicians; Perry & Porter 1982; Rainey, 2009), each with their own goals and priorities. This inherent complexity and diversity of stakeholders creates a challenging environment when it comes to implementing incentive schemes. As highlighted by Dixit (1997), navigating this multi-faceted landscape requires a cautious approach to incentives, often resulting in incentive structures that are comparatively weaker in intensity and scope. The reason for this caution lies in the need to balance the various interests and demands of these diverse groups while aligning organisational goals with the public interest. Thus, policy makers and managers have to deal with the fact that the preferences and expectations of these stakeholders may differ significantly.

- The challenge of accurate quantification of the various performance dimensions in the public sector arises from the multi-layered nature of public service delivery, where good outcomes do not always translate into easily quantifiable metrics. This complexity presents decision-makers with a difficult choice: either to include only those performance dimensions that can be easily measured or to try to capture a broader range of performance criteria. The first option, selective inclusion due to ease of measurement, may unintentionally lead to a suboptimal outcome for overall performance. When decision-makers limit incentives to easily quantifiable metrics, they may inadvertently neglect other critical aspects of performance that are less tangible but equally important. This omission can lead to a myopic focus on specific, easily measurable outcomes that may overshadow the broader goals and mission of the public organisation (Burgess and Ratto, 2003; Tirole, 1994).
- Incentive schemes usually assume that individuals derive their primary benefits solely from the incentives themselves, without taking into account the intrinsic rewards people may derive from efforts made in the service of the organisation. In the public sector, workers often find intrinsic motivation in various aspects of their tasks. Public sector workers may be driven by the ideals and ethical purpose that their agency represents. In essence, public sector employees are often motivated by a strong commitment to public service and the common good, which is inconsistent with traditional private sector motivational approaches such as monetary incentives. In addition, public sector positions often offer greater job security and longer tenure, factors that may influence the perceived value and impact of certain motivational strategies commonly used in the private sector to retain employees.
- Incentive structures are usually based on the assumption that individuals or teams (depending on the level at which incentives are used) have a significant influence on the outcomes of the tasks for which they are responsible and that they can consistently work towards the achievement of specific goals. However, in public sector organisations there is often confusion about the cause-effect relationships between actions and outcomes, and managers have difficulty accurately predicting the potential outcomes of different courses of action. Moreover, measured performance often depends not only on the efforts and decisions of an individual or team, but also on decisions made elsewhere within the organisation, on collaboration with external stakeholders and on the impact of unpredictable and uncontrollable external events. In such complex cases, the achievement or non-achievement of goals does not necessarily reflect the actual performance of the individual or team concerned.

The use of incentive schemes in public sector organizations has generated mixed results. A study by Hur (2018) found that job satisfaction for public sector managers primarily stems from factors intrinsic to the job itself, rather than external conditions or the work environment. These findings align with earlier research indicating that material rewards such as salaries are not strong motivators for public service leaders (Boyne, 2002 or Khojasteh, 1993). Similarly, Bevan and colleagues (2019) observe that many healthcare professionals are often driven by "knightly" motives.

Lessons learned

Expanding on the earlier discussion regarding digital transformation, we argue that HR management in the public sector should prioritize fostering an 'agile workforce,' as advocated by van Ark et al., 2023. By an agile workforce, we mean a workforce that operates with maximum flexibility and minimal constraints, unlocking the full potential of its employees while ensuring their sustained commitment to the organization. This approach stands in contrast to an excessive emphasis on performance management in HR practices.

We posit that this approach proves particularly beneficial in addressing the challenges posed by digital transformation. For instance, in the swift adoption of technologies, an agile workforce can quickly acquire and integrate novel technologies into their workflows, positioning the organization at the forefront of technological advancements. Additionally, emphasizing collaboration in agile practices fosters effective communication and collaboration among diverse skill sets, ensuring a comprehensive consideration of different perspectives in the digital transformation process. Moreover, agile methodologies' stress on iterative and incremental progress enables organizations to continuously refine strategies, promptly test ideas, and make adjustments based on feedback, leading to more successful and sustainable outcomes.

As previously mentioned, a successful digital transformation necessitates, foremost, the acquisition of crucial skills and the elimination of structural and systemic barriers within the organization. In this context, the HR department assumes a pivotal role, poised to make a substantial contribution. It is imperative for the HR department to take the lead and conduct thorough analyses of skills gaps within companies. Subsequently, HR can formulate and implement targeted training programs and identify areas where external skills acquisition, such as through consultants, is essential.

Particularly noteworthy is the shift toward an agile workforce capable of flexible action and optimal talent utilization, requiring robust consulting processes and the active involvement of service providers to ensure high employee engagement. Talent management assumes a central role in this context, demanding a comprehensive reassessment of HR practices. This includes the redesign of roles and refinement of protocols for candidate selection and onboarding. The significance of innovative hiring practices is underscored by the competitive talent landscape and the goal of augmenting productivity, particularly given the pay gap between the public and private sectors.

These observations lead to the following seven additional questions for further consideration:

9. What are the key differences between human resource management in the public sector and the private sector?
10. How can the effectiveness of HR practices in the public sector be measured?
11. What are the outcomes and implications of using incentives in public sector organizations, particularly concerning job satisfaction, intrinsic motivation, and overall organizational performance?
12. What are the challenges and complexities associated with defining and measuring performance in multidimensional public sector contexts, and how do decision makers navigate these challenges when adopting performance management?

13. How do the incentive structures in the public sector affect the job satisfaction of employees?
14. What specific skills and competencies does the public sector need to redefine in the face of digital transformation, and how can HR practices bridge the existing skills gap?
15. How can talent management in the public sector be restructured to attract and retain talent?

Conclusion

Over the past decade, the primary approach to productivity improvement in the public sector has focused much on implementing cost-cutting measures and reducing resource consumption. Although this approach has been quite effective in terms of raising productivity over the short term, this approach has been criticised for a variety of reasons.

In our assessment, we advocate expanding the current review's scope beyond the traditional focus on efficiency and cost reduction to encompass a more comprehensive evaluation of organizational productivity and effectiveness. Such a broadening of scope necessitates a well-defined concept of productivity and improvement in its measurement taking account of multiple outputs, outcomes and quality improvements. This definition should incorporate, wherever feasible, the social value contributed by public services, while considering the availability of relevant data sources.

To enable this broad perspective, we provide in this paper a more in-depth insight into two key productivity-enhancing areas: Digital Transformation and Human Resource Management. These aspects are critical to achieving the goals of the cross-government review of public sector productivity. In our effort to support the ambitious intentions of this review, we present a set of guiding questions for both topics. These questions are intended to enrich the perspective of the review in a meaningful and constructive way.

References

- Abdirahman, M., Coyle, D., Heys, R., & Stewart, W. (2020). A Comparison of Deflators for Telecommunications Services Output. *Economie et Statistique / Economics and Statistics*, 517-518–519, 103–122. <https://doi.org/10.24187/ecostat.2020.517t.2017>
- Acemoglu, D., Ozdaglar, A., & Yildiz, E. (2011). Diffusion of innovations in social networks. *2011 50th IEEE Conference on Decision and Control and European Control Conference*, 2329–2334. <https://doi.org/10.1109/CDC.2011.6160999>
- Aldridge, S., Hawkins, A., & Xuereb, C. (2016). Improving public sector efficiency to deliver a smarter state. Retrieved from <https://quarterly.blog.gov.uk/2016/01/25/improving-public-sector-efficiency-to-deliver-a-smarter-state/>
- Arthur, J. B. (1994). Effects of human resource systems on manufacturing performance and turnover. *Academy of Management journal*, 37(3), 670-687.
- Atkinson, A. B. (2005). *Atkinson Review: Final Report: Measurement of government output and productivity for the National Accounts*. Basingstoke: Palgrave Macmillan.
- Augoustinos, M. & Walker, I. (1996) *Social Cognition: An Integrated Introduction*. London: Sage
- Baumol and Bowen (1966) *Performing arts-the economic dilemma: a study of problems common to theater, opera, music and dance*. Gregg Revivals.
- Beeri, I., Uster, A., & Vigoda-Gadot, E. (2019). Does performance management relate to good governance? A study of its relationship with citizens' satisfaction with and trust in Israeli local government. *Public Performance & Management Review*, 42(2), 241-279
- Bevan, G., Evans, A., & Nuti, S. (2019). Reputations count: why benchmarking performance is improving health care across the world. *Health Economics, Policy and Law*, 14(2), 141-161.
- Bharosa, N. Lee, J. and Janssen, M. (2010) Challenges and obstacles in sharing and coordinating information during multi agency disaster response: Propositions from field exercises, *Information Systems Frontiers*, 12:49-65
- Bjerde, A., & Demirgüç-Kunt, A. (2021, March 30). Digitalization and data can vastly improve public service delivery for citizens. *World Bank Blogs*. <https://blogs.worldbank.org/europeandcentralasia/digitalization-and-data-can-vastly-improve-public-service-delivery-citizens>
- Blank, J. L., & Valdmanis, V. G. (2015). Technology diffusion in hospitals: a log odds random effects regression model. *The International journal of health planning and management*, 30(3), 246-259.
- Boyne, G. A. (2002). Public and private management: what's the difference?. *Journal of management studies*, 39(1), 97-122.

Boyne, G., Poole, M., & Jenkins, G. (1999). Human resource management in the public and private sectors: An empirical comparison. *Public Administration*, 77(2), 407-420.

Brynjolfsson, E., Hitt, Lorin M., & Yang, S. (2002). Intangible Assets: Computers and Organizational Capital. *Brookings Papers on Economic Activity*, 2002(1), 137–198. <https://doi.org/10.1353/eca.2002.0003>

Brynjolfsson, E., Rock, D., & Syverson, C. (2021). The Productivity J-Curve: How Intangibles Complement General Purpose Technologies. *American Economic Journal: Macroeconomics*, 13(1), 333–372. <https://doi.org/10.1257/mac.20180386>

Burgess, S., & Ratto, M. (2003). The role of incentives in the public sector: Issues and evidence. *Oxford review of economic policy*, 19(2), 285-300.

Callon, M. (1986) Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay, in: J. Law (Ed), *Power, action and belief: a new sociology of knowledge?* London, Routledge, pp.196-223

Carrera, L., & Dunleavy, P. (2010). Why does productivity vary across NHS hospital trusts in England? Untangling how management competence and the use of ICTs shape hospitals' performance. *Performance'*, LSE Public Policy Group Mimeo, March.

Combs, J., Liu, Y., Hall, A., & Ketchen, D. (2006). How much do high-performance work practices matter? A meta-analysis of their effects on organizational performance. *Personnel psychology*, 59(3), 501-528.

Coyle, D, van Ark, B, and Pendrill, J. (2023). *The Productivity Agenda*. Report No. 001. The Productivity Institute.

Coyle, D., & Hampton, L. (2023). 21st century progress in computing. *Telecommunications Policy*, 102649. <https://doi.org/10.1016/j.telpol.2023.102649>

Coyle, D. (2023). Why isn't digitalisation improving productivity growth? In D. Coyle, B. van Ark, J. Pendrill (2023), *The Productivity Agenda*. Report No. 001. The Productivity Institute.

Coyle, D., Dreesbeimdiek, K., & Manley, A. (2021). Productivity in UK healthcare during and after the Covid-19 pandemic. *National Institute Economic Review*, 258, 90-116.

Deloitte. (2017). *Assessing the value of TfL's open data and digital partnerships*. Transport for London.

Dixit, A. (1997). Power of incentives in private versus public organizations. *The American Economic Review*, 87(2), 378-382.

Drucker, P. F. (1963). *Managing for business effectiveness*. Harvard Business Review.

Dunleavy, P. (2021). Regional and local productivity in the public sector: where do we stand?.

Dunleavy, P., Margetts, H., Bastow, S., & Tinkler, J. (2006). New public management is dead—long live digital-era governance. *Journal of public administration research and theory*, 16(3), 467-494.

Førsund, F. R. (2017). Measuring effectiveness of production in the public sector. *Omega*, 73, 93-103.

Francis-Devine, B. & Powell, A. (2023). UK labour market statistics. House of Commons.

Garling, O. (2024). Productivity plans for local government: More than just reducing expenditure. Retrieved from <https://www.productivity.ac.uk/news/productivity-plans-for-local-government-more-than-just-reducing-expenditure/>

Gerlach, B. (2021), Assessing Public Sector Productivity. The case of the courts, public prosecution service and the police in the Netherlands, Discussion Paper, Statistic Netherlands. <https://www.cbs.nl/en-gb/background/2021/28/assessing-public-sector-productivity>

Geroski, P. A. (2000). Models of technology diffusion. *Research Policy*, 29(4), 603–625. [https://doi.org/10.1016/S0048-7333\(99\)00092-X](https://doi.org/10.1016/S0048-7333(99)00092-X)

Greenway, A., Terrett, B., & Bracken, M. (2021). Digital transformation at scale: Why the strategy is delivery. *Do Sustainability*.

Haque, A. (2021). The COVID-19 pandemic and the role of responsible leadership in health care: thinking beyond employee well-being and organisational sustainability. *Leadership in Health Services*, 34(1), 52-68.

NHS Health Scotland. (2016). *Economics of prevention* (3; Inequality Briefing). <https://www.healthscotland.scot/media/1089/economics-of-prevention-mar16.pdf>

Heys, R. (2019, May). Bridging the gap between GDP and welfare. In ESCoE Conference, King's College London. Retrieved from <https://www.escoe.ac.uk/events/escoe-research-seminar-12-february-2019>.

Hur, Y. (2018). Testing Herzberg's two-factor theory of motivation in the public sector: is it applicable to public managers?. *Public Organization Review*, 18, 329-343.

Johnston, R. (1998). The effect of intensity of dissatisfaction on complaining behaviour. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 11, 69-77.

Kalleberg, A. L., Marsden, P. V., Reynolds, J., & Knoke, D. (2006). Beyond profit? Sectoral differences in high-performance work practices. *Work and occupations*, 33(3), 271-302.

Kampen, J. K., De Walle, S. V., & Bouckaert, G. (2006). Assessing the relation between satisfaction with public service delivery and trust in Government. The impact of the predisposition of citizens toward Government on evaluations of its performance. *Public Performance & Management Review*, 29(4), 387-404.

Kennedy, N., Win, T. L., Bandyopadhyay, A., Kennedy, J., Rowe, B., McNerney, C., ... & Brophy, S. (2023). Insights from linking police domestic abuse data and health data in South Wales, UK: a linked routine data analysis using decision tree classification. *The Lancet Public Health*, 8(8), e629-e638.

Khojasteh, M. (1993). Motivating the private vs. public sector managers. *Public personnel management*, 22(3), 391-401.

Mandl, U., Dierx, A., & Ilzkovitz, F. (2008). The effectiveness and efficiency of public spending (No. 301). Directorate General Economic and Financial Affairs (DG ECFIN), European Commission.

Nawafleh, S. (2020). The implementation of e-government and the trust of citizens in public sector performance: the mediating role of service quality. *International Journal of Public Sector Performance Management*, 6(1), 17-35.

ONS (2023) Public service productivity: Total, UK, 2020, Public service productivity - Office for National Statistics. Available at: <https://www.ons.gov.uk/economy/economicoutputandproductivity/publicservicesproductivity/articles/publicservicesproductivityestimatestotalpublicservices/2020> (Accessed: 16 November 2023).

Ogden, K. and Phillips, D. (2023). The distribution of public service spending. IFS Deaton Review of Inequalities

Oh, H., & Hong, J. H. (2014). Citizens' Distrust in Government and Project Implementation in the Public Sector. *Korean Econ. Rev*, 30(1)

Perry, J. L., & Porter, L. W. (1982). Factors affecting the context for motivation in public organizations. *Academy of management review*, 7(1), 89-98.

Peterson, P. E. (1981). *City limits*. University of Chicago Press.

Rainey, H. G. (2009). *Understanding and managing public organizations*. John Wiley & Sons.

Sage, D., Zebrowski, C. & Jörden, N. (2022). *ResilienceDirect during Covid-19: understanding and enhancing digital collaboration*. Loughborough University.

Seager, A. (2007). ONS London staff seek new jobs rather than go to Newport. *The Guardian*, 26 January

Shive, M. (2021). How should governments source public services during a crisis?. *Economics Observatory*.

Simpson, H. (2009). Productivity in public services. *Journal of Economic Surveys*, 23(2), 250-276.

Somani, R. (2021). *Public-Sector Productivity (Part 1)*.

Tirole, J. (1994). The internal organization of government. *Oxford economic papers*, 46(1), 1-29.

Van Ark, B. (2022) *Making Public Sector Productivity Practical*, The Productivity Institute and Capita.

Van Ark, B. & Hoskins, J. (2004). *The Productivity Paradox of Artificial Intelligence: Insights for the Police Sector*. The Productivity Institute.

Van Ark, B., Hoskins, J. and Jörden, N. (2023). Public Sector Productivity – managing the Baumol cost disease. In D. Coyle, B. van Ark, J. Pendrill (2023), *The Productivity Agenda*. Report No. 001. The Productivity Institute.

Van De Voorde, K., Paauwe, J., & Van Veldhoven, M. (2010). Predicting business unit performance using employee surveys: monitoring HRM-related changes. *Human resource management journal*, 20(1), 44-63.

Van de Walle, S., & Bouckaert, G. (2003). Public service performance and trust in government: The problem of causality. *International journal of public administration*, 26(8-9), 891-913

Vermeeren, B. (2014). Variability in HRM implementation among line managers and its effect on performance: A 2-1-2 mediational multilevel approach. *The International Journal of Human Resource Management*, 25(22), 3039-3059.

Westwood, A., Sensier, M., & Pike, N. (2021). Levelling up, local growth and productivity in England. *Insights Paper*, (005).

Zymek, R., & Jones, B. (2020). UK regional productivity differences: An evidence review. Report for the Industrial Strategy Council.