

Summary

In this report, we examine the extent to which and in which areas artificial intelligence (AI) may provide new opportunities to streamline and meet the workforce needs in the public sector. We also investigate the challenges that may arise in effectively utilising AI in the public sector. Additionally, we provide an overview of the current use of AI in the public sector.

In this section, we summarise our findings and conclude with a brief presentation of our five policy recommendations.

Rapid Developments in AI Technology

Over the past decade, significant technological breakthroughs in AI have taken place. These advancements have been enabled by increasing computational power, greater availability of data, and innovations in AI research. Since the breakthrough of AI based on so-called neural networks (a type of algorithm inspired by how the brain functions) around 2012, development has progressed rapidly, and AI systems have become increasingly capable. Since then, AI has been successfully applied in various domains, such as language, vision, speech recognition, gaming, and biological research. The launch of OpenAI's chatbot ChatGPT in November 2022 marked a turning point for public interest in the new generation of AI, where *large language models* and *generative AI* have impressed with their ability to master language and generate text or graphics based on user instructions.

In our report, we do not limit ourselves to a specific type of AI, such as generative AI. Instead, we aim to provide a comprehensive overview of AI, its opportunities, and challenges in the public sector. Beyond AI based on neural networks, there has also been progress

in other AI methods that enable more powerful statistical analyses. Such methods are frequently used by organisations today to gain deeper insights into their data.

There is uncertainty regarding the future development of AI. The rapid advances in recent years have led some of the world's leading AI researchers to predict that we may be heading towards a scenario with *artificial general intelligence* (AGI), where computer systems equal or even surpass human capabilities in several respects. However, it is possible that technological development will eventually encounter new barriers, leading to a plateau in progress and a decline in investment interest. Similar stagnations have occurred before in AI history, such as the development of expert systems in the 1990s.

Potential Economic Effects

Our review of research on the economic effects indicates that AI can be expected to increase productivity and productivity growth.

AI can be utilised by professionals to automate parts of their work or to complement them in their daily tasks. This is supported by several recent experimental studies showing how the use of large language models can enhance professional productivity when employed as a tool in selected occupations and tasks.

AI can also be used to streamline organisations, for instance, through more efficient governance and administration. Even where AI is not technically viable at present or is restricted due to ethical or legal reasons in core operations, it could still enhance organisational performance through support and management functions.

Another channel through which AI affects the economy is its potential to contribute to more productive research and development. This potential is illustrated by the fact that two of the 2024 Nobel Prizes were awarded for innovations in AI based on neural networks. In this way, AI can accelerate scientific and technological progress.

Modern AI is built on self-learning and data-driven algorithms. Significant advancements have been made in this field over the past 10–15 years. The use of AI has expanded from very few

organisations to many in both the public and private sectors. The increase in AI adoption has been particularly pronounced in the 2020s. Until recently, it has therefore been difficult to study the economic effects of AI. Knowledge remains limited, and conclusions are inevitably marked by substantial uncertainty. Economic research that relies on well-informed assessments suggests effects ranging from modest to dramatic.

Even if productivity increases in different parts of the economy, the impact on labour demand in the public sector remains uncertain. Under certain conditions, rationalisation may allow for the management of skills shortages or labour shortages, for example, due to an ageing population, while maintaining service quality. However, there are limits to the extent of rationalisation in the public sector, as human involvement will likely remain essential in many tasks, particularly in healthcare, social care, and education. At the same time, AI-driven efficiency improvements in other parts of the public and private sectors may free up labour for personnel-intensive areas such as healthcare. Productivity gains may also manifest as improved quality of services. AI can further enable the development of new types of services, leading to new tasks and professions.

The Current and Potential Use of AI

To measure how AI is used and could potentially be used in the public sector, we have utilised data from surveys, job advertisements, and research-based measures of AI applicability at the occupational level, combined with registry data on individuals and organisations. The results based on microdata are derived from an underlying research study by Lodefalk et al. (2025).

We find that AI adoption has increased in recent years, albeit from low levels. In 2021, less than a third of public sector organisations reported using AI, which is the most recent year for which we have official statistics. However, there are significant differences in AI use across sectors with different governing authorities and functions. AI adoption is more common among larger organisations and those with a higher proportion of highly educated employees and IT specialists.

Based on reports on, for example, AI use in government agencies and municipalities, we have also attempted to form a picture of what AI is used for. This picture is not comprehensive but rather anecdotal. There is quite a broad range of applications for AI in the public sector so far. Many of these applications pertain more to support functions rather than core operations. For example, AI is more commonly used in municipal administration than in its social services. At the same time, we have seen ongoing efforts to integrate AI into core operations as well.

More generally, Sweden is relatively highly digitalised, at least when it comes to digitising existing operations. However, our assessment is that Sweden is not at the forefront when it comes to governance and proactive work in digitalisation, structural changes to leverage digitalisation, and the use of more advanced digital technologies such as AI. In this regard, we seem to have relatively much to learn from, e.g., other Nordic countries.

To what extent and in what areas could the public sector use AI? One way to analyse this is by considering how applicable AI technology is to different occupations. Our analysis of AI's applicability is based on the exposure measure DAIOE (*Dynamic AI Occupational Exposure*) from Engberg *et al.* (2024c), which has been developed by, among others, the authors of this report and builds on established measures in the literature. In short, an occupation is more exposed to AI if the skills or abilities that are important for the profession are those in which AI has made significant advances. However, the measure does not indicate whether AI is primarily used to automate or complement professionals in the occupation, nor does it specify if and when AI will be implemented. The assumption is that if the technology is applicable, it will likely be used in the future, making the measure forward-looking.

According to Engberg *et al.* (2024c), the occupations most exposed to AI in the short to medium term are white-collar jobs focused on *cognitive* tasks rather than *physical* ones. In the public sector, AI is thus considered most applicable to occupations such as planners and analysts, office assistants, and medical secretaries. Some of the most common occupations in the public sector overall, and the majority of the most common occupations at the regional level, are in the upper half of the distribution in terms of AI applicability - that is, at least half of all occupations are less exposed

than these. More physically demanding jobs, such as auxiliary nurses or cleaners, are less exposed. The social factor is also assumed to be more difficult to automate, leading to lower AI exposure, all else being equal, for more socially oriented occupations such as nurses or managers.

When we apply the measure of AI's applicability in different occupations to register-based statistics on public sector employment, we find that just over 20 per cent of employees are highly exposed to AI technology. Approximately 50 per cent of employees are moderately exposed - that is, they are in occupations between the 25th and 75th percentiles in AI exposure.

The applicability of AI in the public sector varies significantly across different functional sectors. Moreover, sectors differ in the extent to which they harness AI's potential by actually using it. Under simplifying assumptions, such as organisations within a functional sector having equal numbers of employees, we make a rough comparison between potential and usage. Comparing the proportion of organisations that report using AI with the proportion of employment that is highly or moderately exposed, we find that some functional sectors have approximately the same proportion using AI as the proportion of employees for whom AI should be applicable. Thus, AI is relatively applicable and is also used. However, we also find indications that there may be significant untapped potential in several functional sectors, such as the education sector and the state sector as a whole.

Scenario Analyses Illustrate Future Developments

To gain an understanding of where in the public sector AI has the greatest potential, we also conduct scenario analyses. We perform simulations comparing the outcome approximately 20 years from now (in 2044) in terms of labour demand and productivity, under four different scenarios regarding AI development.

Our scenario analyses of possible outcomes by 2044 illustrate that there is significant uncertainty in both AI development and its impact, as well as how different organisations might leverage AI. How AI evolves and is applied will have a substantial influence. In reality, the results will likely also depend to a great extent on which

complementary investments are made - or not made - within organisations.

It is important to emphasise that these scenario analyses are simple numerical exercises intended to provide a basis for discussion; they are not forecasts. However, they can indicate where in the public sector (in which types of organisations and occupational groups) the most significant effects can be expected under different scenarios. They can also provide insights into where the gap between current AI usage and potential AI utilisation is the largest.

All other factors that could influence the outcome are disregarded to focus solely on AI's impact. Connections to other parts of the economy are also ignored. However, the scenario analysis is based on the projected future labour demand for different occupations, their estimated AI exposure, and register data covering virtually all organisations and individuals active in the public sector. Thanks to the availability of occupational codes for the vast majority of employed individuals, we can estimate their AI exposure. This enables a detailed analysis of AI in the public sector. We also take into account future labour demand forecasts for different occupational groups from Statistics Sweden (SCB).

Labour demand is calculated based on a hypothetical situation where AI is assumed to increase productivity, for instance, by automating tasks or complementing employees in their roles. The productivity gains are entirely translated into a corresponding reduction in labour demand, maintaining the same level of production as before. In other words, we assume an unchanged level of output. However, this is a strong simplification.

Productivity increases could also potentially manifest as higher quality, and AI could enable new types of services and create new job tasks. In this way, AI could actually contribute to increased demand for public services. We also disregard scalability limitations that may arise due to human cognitive constraints in cases where AI and humans complement each other.

Results of the Scenario Analyses

Without an increase in AI usage - that is, with the status quo in technological application - we find a 15 per cent increase in labour demand in the public sector and a 4 per cent increase in productivity by 2044, all else being equal and based on our simulations. This is our baseline scenario (*baseline*). We will compare the results from the other scenarios against this baseline. We assess that this scenario and its results align well with expectations and forecasts in reports from relevant authorities. However, the scenario may be somewhat optimistic in terms of productivity growth.

In the baseline scenario, a particularly large increase in labour demand is expected for certain occupations, which presents a significant challenge. For instance, demand for the most common occupation in the public sector, auxiliary nurses in elderly care, is projected to grow by 25 per cent, corresponding to an additional 29,000 employees.

In our *conservative* scenario, we assume that AI advances already made at the beginning of the period are gradually implemented in the public sector over the 20-year period. We also assume that this results in a moderate increase (10 per cent) in productivity even in the occupations and sectors where AI is most applicable. The results from this scenario suggest only marginal benefits of AI in terms of reduced labour demand and increased productivity. In short, major challenges remain for the public sector unless AI, or other productivity developments in the private sector, frees up labour.

If we instead turn to our intermediate or *main scenario*, we assume higher productivity gains from AI in the most exposed occupations and sectors, along with a slight increase in overall productivity growth. We consider this our main scenario. A key assumption here is that AI technology does not stagnate at its current level but continues to develop over the 20-year period, enabling higher productivity and productivity growth than in the conservative scenario. AI is adopted in the public sector, and complementary investments are made. Over a 10-year period, we therefore assume that productivity will be 15 per cent higher in the most exposed occupations and sectors, particularly where generative AI is most applicable. Over the entire 20-year period, we assume that

AI generally improves to the point where productivity increases by up to 20 per cent in the most exposed occupations and sectors.

Based on the detailed composition of employment in the public sector and forecasted labour demand, we arrive at the following conclusions in the main scenario. We find that total labour demand in the public sector decreases by 11 percentage points compared to the baseline. However, this does not mean that labour demand declines compared to today, but rather that instead of increasing by just over 15 per cent, it increases by just under 4 per cent. Productivity also rises. The average annual productivity growth over the period is approximately 0.7 per cent instead of the 0.2 per cent in the baseline. According to this scenario, the public sector could therefore become significantly more efficient with the help of AI, and workforce supply challenges could be eased. However, we want to stress that although we consider this scenario possible, it is by no means guaranteed. For it to be realised, we assess that the public sector must both swiftly adopt AI technology and make the necessary complementary investments to fully capitalise on AI's benefits.

The *optimistic* scenario and its outcome can also be briefly mentioned. Here, we assume a more powerful advancement of AI technology, including AI making robotics more applicable, with significant implementation in the public sector - for example, through care robots. The uncertainty surrounding these developments over the time period is substantial - it could be significantly less or significantly greater than expected. Our assessment is that this scenario would also require much larger complementary investments and organisational changes to maximise AI's implementation. What do the results from this scenario indicate? The simulations suggest that AI would significantly benefit the public sector. Labour demand would decrease by just over 4 per cent compared to today and by 10 per cent compared to the baseline. The average annual productivity growth over the period would be approximately 1.2 per cent.

What, then, are the outcomes for different administrative sectors (government agencies, regions, and municipalities) in the scenario analyses? Here, we observe two key points. First, the outcomes differ significantly not only between scenarios but also within them and across different sub-sectors, which is expected given the

variation in occupational composition between, for example, municipal and state sectors.

Second, we observe substantial differences in outcomes *within* sectors in the intermediate and optimistic scenarios. That is, the outcomes vary between government agencies, between regional organisations, and between municipality organisations. We find this both interesting and concerning, and it is something that should be monitored, which is why we return to this issue in our recommendations. It cannot be ruled out that AI implementation may exacerbate existing disparities within a sector for organisations with different conditions and levels of productivity. This could, for example, be the case within the municipal sector. If we again take municipalities as an example, we argue that if municipalities *also* differ in the degree and pace of AI implementation, this could further reinforce disparities. In other words, it could become more challenging for certain municipalities to provide services and goods to their residents at a level comparable to the rest of the country.

Challenges of AI in the Public Sector

This brings us to various forms of challenges, which can consist of both obstacles to AI adoption and risks associated with its use in the public sector. The analysis in this section is based on literature reviews of research and reports, as well as survey studies.

The extent of obstacles and risks varies significantly between organisations of different sizes and types. In areas such as healthcare, operations are relatively heavily regulated and involve matters of life and health, whereas in other sectors, activities may be more administrative in nature, subject to fewer regulations, and where incorrect decisions do not cause immediate or severe harm. Thus, the challenges of fully harnessing AI's potential are greater in some areas of the public sector than in others.

Our review of challenges related to AI usage highlights both technical limitations and other factors, such as competence, regulation, leadership, costs, and previous digitalisation efforts. These factors influence where and when AI can provide the greatest benefits in the public sector.

As already mentioned, AI technology has developed rapidly in recent years. However, AI still has significant limitations, and there is uncertainty regarding how quickly it will continue to evolve. Researchers therefore emphasise the need to monitor (and influence) AI development and its applications, as well as its effects - particularly on the labour market.

At the same time, AI's technical limitations underscore the importance of human competence, ensuring that AI is used appropriately and effectively. Training and continuous education in AI are recurring themes in reports from international organisations and various studies. This involves both the need for many employees to acquire basic AI competence and the need for specialists with either purely technical expertise or multidisciplinary skills. A challenge in this regard is that, given the likely continued rapid evolution of technology, both educational programmes and ongoing professional development must be continuously updated and kept relevant.

Another major challenge in implementing AI in the public sector is the presence of unclear or complex regulations concerning AI and data usage. Based on survey results, we assess that regulatory complexity has already significantly contributed to the limited use of AI in the public sector. Practical guidelines for AI implementation are therefore needed, alongside a review and potential adjustment of relevant regulations and their enforcement. AI could already be adopted to a greater extent than at present in many tasks where data are not sensitive or related to personal information, such as in support functions within public administration.

Given that data is central to modern AI and Sweden is relatively digitalised with high-quality registers, we believe there is substantial potential to develop and benefit from AI in the public sector. However, regulatory adjustments are likely required to enable the use of powerful computing resources, such as cloud services, and to facilitate data sharing between public sector organisations while ensuring compliance with privacy and cybersecurity requirements.

Leadership is likely to be crucial for the adoption and effective utilisation of new technology such as AI. Long-term investments will be required - not only in the technology itself but also in new working methods and organisational changes to ensure that AI

contributes to noticeable productivity gains. As with previous information technologies, there is a risk that AI may initially underdeliver if complementary investments are lacking - not just in technology but also in training and regulatory frameworks. Leadership also needs to engage a broad range of employees in AI adoption. This will both promote AI usage and facilitate the identification of tasks or problems within organisations where AI could be most beneficial, enabling the development of appropriate AI solutions. Some AI initiatives may be implemented without additional resources, but certainly not all. AI is likely to become increasingly accessible as the IT and communication systems of the public sector are upgraded. We also assess that certain AI solutions could be adopted more widely without major additional costs. However, many AI solutions require adaptation or development for specific contexts or for core functions involving sensitive data and decisions relating to individuals, which can be relatively costly. We also see a significant need for investments in skills development at all levels, which will require considerable resources.

In line with the AI-kommissionen (2024), our analysis suggests that substantial new resources are required to enable greater AI adoption in the public sector. In addition to the aforementioned needs, resources are also required to develop significantly better AI infrastructure for the public sector. Sweden's decentralised governance model, with 678 entities (367 agencies, 21 regions, and 290 municipalities) that operate with a relatively high degree of autonomy, presents particular challenges for efficiently implementing and benefiting from AI in the public sector. Firstly, this creates a significant risk of duplication and inefficiency if each organisation separately investigates the feasibility of using an AI solution, tests it, and then scales it up. Secondly, it is likely to exacerbate disparities between organisations with different capabilities and conditions.

Our review highlights the need for greater coordination, collaboration, and information sharing, as well as national initiatives. Work is already underway to develop a common digital infrastructure for public administration, which could potentially be further expanded to both support and share individual initiatives and to develop some common AI solutions. We therefore welcome the proposal of the AI-kommissionen (2024) for an "AI workshop" for

the public sector, including an “AI task force” to support various organisations within the public sector.

Recommendations

Based on our analysis, we conclude that AI in the public sector has the potential to generate significant societal benefits. However, for these benefits to be realised, several measures must be taken. We have identified five areas where action is needed, tailored to the specific conditions of the public sector. Below, we summarise these recommendations.

1. **A strategy and leadership for AI in the public sector:** A clearly formulated, long-term, and well-anchored strategy for AI use in the public sector is required, alongside strong and clear leadership. Given the uncertainty and rapid development of AI, the strategy should be reviewed at least annually and revised as needed. This process requires data on AI usage, linking to our recommendation below on monitoring, developing, and conducting research in this area.
2. **Provide guidance and review regulations:** It is urgent and highly important to provide guidance and conduct a review of regulations concerning data sharing and AI use. Without this, we assess that unclear or complex regulatory frameworks will continue to cause many public organisations, professionals, and private providers of public welfare services to adopt a wait- and-see approach and delay the use of AI.
3. **Education and continuous training:** There are strong reasons to consider how individual professionals, their workplaces, and their organisations can be enabled to develop AI-related skills to a much greater extent - and on an ongoing basis. Education and continuous training are, in our assessment, essential for harnessing the potential of AI in the public sector. In addition, public authorities should review the availability of training in AI, the capacity to educate AI specialists, the integration of AI into other educational programmes, and the structuring of different fields of study in light of AI's impact.

4. **Collaborate, coordinate, and consider structural reforms:**

Significantly expanded national initiatives are needed across the entire public sector to support public organisations at various levels in adopting AI. These supporting measures should include significantly enhanced collaboration, coordination, and information sharing on AI between public sector organisations.

At the same time, an inquiry should be launched to explore the development of common AI infrastructure for public administration. Such infrastructure would likely require substantial additional resources but is considered crucial for promoting an efficient public sector through AI. Within this infrastructure, Sweden's high-quality data could be securely shared and used for AI development, training, and application—leveraging both in-house computing power and cloud services. Furthermore, the infrastructure could offer certain common AI solutions and services.

Additionally, structural reforms in public administration would be desirable to address current and, above all, future challenges, including making full use of AI. Whether the most appropriate approach would be a redistribution of responsibilities between different levels of government, the consolidation of smaller units, or a combination of both should be examined.

5. **Monitor, develop, and conduct research:** Given the high uncertainty surrounding AI's future development and its potential positive and negative effects on society and the public sector, continuous and thorough monitoring and analysis are essential. We therefore propose the establishment of a body or function that monitors AI from a societal perspective, focusing on the need for both short- and long-term public interventions and necessary changes within the public sector.

We also note a remarkable lack of research on AI's impact on labour demand and productivity in the public sector. As part of this monitoring and follow-up process, Statistics Sweden (SCB) should continuously produce statistics on AI use in the public sector rather than relying on ad hoc data collection.