

## Challenges of AI Adoption in China Public Service and its Impact on Efficiency and Performance

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### Abstract

AI is one of the most discussed technologies and is anticipated to reshape public services in the future in China to enhance the quality of services and thus promote the growth of the economy in the respective country. This paper aims to assess the current position, potential and challenges of implementing AI in the Chinese public sector. The research adopted the interpretative research philosophy and inductive research approach to investigate the implications of AI in organizations and the sociopolitical, economic and ethical concerns through interviews, questionnaires and case analysis. From the review, it is apparent that the development of AI has continued to enhance in the current world especially in aspects such as health, learning institutions, and transport through cities, this is due to the support from companies such as Alibaba, Tencent, and Baidu. However, the study also reveals that several barriers prevent AI from being implemented, namely some of these are about the job, tools, competencies and professionalism such as data and algorithms. The consequences of these challenges on efficiency and performance of public services are tremendous, which can cause problems such as workforce breakdown, decrease in productivity, and loss of public confidence. The study suggests how AI can be effectively integrated into talent management, government-industry-academia partnerships, effective policies, data sharing, and investment in AI infrastructure. Future work should aim at carrying out research to determine the effects of implementing AI in the long run, examine ways of dealing with job losses and evaluate the efficacy of measures that have been put in place to ensure the use of AI is ethical. This way of thinking is designed to tap into the maximum capacity of AI as a tool for improving the quality of public services and supporting the development of China's economy and society.

**Keywords:** Artificial Intelligence Adoption, Public service, Efficiency, Performance

### Introduction

AI (artificial intelligence) has taken centre stage in the area of technology that is changing multiple sectors and public services as well. In the case of China, AI implementation in the public sector is expected to be beneficial in terms of increasing efficiency, improving service

provision and eventually contributing to economic growth (Chen et al., 2021). However, all the benefits of these emergent technologies including but not limited to technological, socio-economic, and ethical realms cannot be fully realized. By presenting the current problem in AI adoption of state services in China, the researcher will spot the main difficulties and prospects this process presents.

China as one of the most developed countries in artificial intelligence has a lot to show while the private and public sectors go in the race for innovation. Having the widest population in the world, and owing to its dynamic technology domain, it presents a fertile region where AI is being designed, developed, and applied. Similarly, the top tech giants of China like Alibaba, Tencent and Baidu spearhead the development of the AI sector ranging from data analysis to innovative AI applications (Keane et al., 2020). The impact on Public Services in China is vast. AI plays the role of a game changer, from the field of healthcare and education to transportation and urban management. It has promising potential to alter the way public services are rendered and experienced. For instance, AI-driven medical diagnosis is very possible and will be better in terms of patient care. On the other hand, smart transport systems will lead to easy urban mobility and less congestion. But these advantages nevertheless need to be achieved while the problems are being conquered.

It is one of the main issues that automating jobs in public services in China may pose to millions of employees as tasks may be automated. Machines in the production of half of the work activities, day-to-day jobs with predictable programming and routine tasks will be threatened by automation by AI technologies. Thus, this automation might worsen the problem of income differences and concern about the relevance and stability of these jobs for people working in the affected sectors. Technological feasibility, likewise, stands out among the key factors shaping the success of AI implementation. While China has made significant strides in AI research and development, challenges remain in nurturing a supportive ecosystem necessary for sustained innovation. The lack of a robust data-sharing framework further hinders progress, as access to diverse datasets is essential for training AI systems effectively (Gaonkar et al., 2020).

The shortage of workers with practical skills is a major problem in the Chinese AI engineer and AI adopter development. In the USA, the substantial number of experienced data scientists is more than those in China which is not well positioned to cover the AI talent need (Lundvall & Rikap, 2022). Besides, the integration of AI technologies may further profit the digital skills but the wages for low and medium-skilled labour will decrease. From ethical and social standpoints, the AI acceptance is even more demanding. The AI technologies-driven shift of workers' positions raises serious moral queries about employment security and the well-being of society. Moreover, in addition to that the problems that may arise with data privacy, algorithmic bias, and legal liability are the primary barriers to its adoption.

AI integration in the public services of China is a complex issue that has technical and socio-economic dimensions and to successfully face racism requires a broad strategy. Policies of governments have an extremely important function to fulfil by building up an AI environment for development and adoption. For AI growth in China to be sustainable, initiatives that help to close or bridge the AI talent gap and create sharing frameworks for data are essential (Aljohani et al., 2022). For instance, the cooperation in AI development between government, companies and academic institutions must be assured to deploy the technology responsibly and ethically. Through the solution of those issues, AI technology will ensure that the public administration works perfectly, boost GDP and improve the citizens' lives.

AI, maintenance of the public services in China, brings the promise of a revolution in service delivery that leads to economic growth. However, the main achievements can be reached only through thorough consideration of numerous existing problems in the field such as technical feasibility, talent deficit, ethical issues, and capital constraints. Through the promotion of a creation-favorable environment for AI development and acceptance, China can disclose the entire capacities of AI that would result in enhanced public services and a more satisfied population.

### **Objectives**

- To understand the recent trends of AI in China
- To identify the challenges in the adoption of AI in public services in China.
- To identify the impact of AI adoption challenges on efficiency and performance.
- To recommend certain ways for the successful adoption of AI in the public sector in China.

### **Method**

The researcher picked an interpretivism research philosophy for this research because it recognizes the complicated social-economic and ethical aspects involved when introducing AI in China's public services apparatus. On the contrary, instead of reducing humanity to positive phenomena and measurable events, interpretivism distinguishes the subjective nature of human experiences, taking into account the meanings that people give their actions and interactions (Sanchez et al., 2023). AI-related absorption allows to look into the phenomenon extensively from the perspective of the authorities, representatives of businesses and workers who might be affected by the disruption. This kind of thinking calls for alertness to AI implementation forcings and a sophisticated assessment of the kinds of effects that success and public services ' provision would have afterwards. As a result, the study can provide the most relevant information and advice on how to stylize the implementation of AI in the Chinese civil service by the interpretive approach.

Furthermore, an inductive approach is critical in this undertaking because it helped close up the observation and computation of data which, in turn, yielded research findings. On the contrary, with deductive methods that rely on propositions as the guidelines for either confirming or disproving them, the inductive approach involves data-gathering and analysis to enable to identify underlying types, connections or trends (Siponen & Klaavuniemi, 2020). Since AI adoption by the public sector in China has certain characteristics such as multi-dimensionality and variation, the inductive method allows the researchers to discern the reasons and the factors that cannot be assumed at first glance. Through process-oriented analysis of various qualitative data, interviews, surveys and case studies, a comprehensive study can produce in-depth and insights-rich findings. Under this approach, AI researchers can uncover complex understandings about the challenges and opportunities for AI adoption that will address the most viable recommendations for a successful implementation of AI in the public sector.

The structure of the research with explanatory design is key to the study which will clarify the core issues and the cause impact of the artificial intelligence (AI) application in public services in China. Unlike descriptive research designs that simplistically describe phenomena or predictive research designs that tell future outcomes, explanatory research is about explaining the occurrence, and this relation (Haydam & Steenkamp, 2020). As AI is very complex and multi-dimensional, an explanatory approach is the only method that will help

the researchers dive into the fundamental components that cause these challenges. The analysis of causal links and factors such as workforce displacement, ethical considerations, and technical feasibility will aid in revealing the bottom-line problems that can be tackled. The information acquired through these analyses helps public authorities, business leaders, and other players design and carry out tailored approaches to AI adoption which leads to higher implementation success in the AI-governance field.

The involvement of bringing people who gathered qualitative data for research is beneficial for many reasons. Secondary data gives access to a very wide selection of already existing information in many different places such as academic journals, government reports or industry publications (Mazhar et al., 2021). Varied data sources enable encompassing investigation of complex AI-related issues and prospects in China's government sector. Furthermore, secondary data collection is cost saving and time-saving method for primary data collection techniques like interviews and surveys as it eradicates the need to start all processes afresh. Furthermore, usage of the secondary data gives researchers access to extraordinary information and opinions from different directions which only increases the information depth and richness of studies. Through a systematic review and an examination of available literature and data, the analysis will deliver an inclusive insight into the factors in play that may influence AI adoption, eventually serving as a basis for recommendations to policy-makers, industry leaders, and other stakeholders.

Choosing a thematic data analysis method for this research allows to explore ideas/concepts in the data and establish themes, patterns and trends in the data. Thematic analysis provides researchers with the systematic process of organizing and interpreting qualitative data hence aids in the meaning of information and findings (Peel, 2020). The application of thematic analysis helps in discovering the hidden patterns and trends that exist in the complicated issues facing AI implementation in the Public sector of China. Thematic analysis helps in recognizing the reoccurring patterns and familiar themes across different types of information sources, including interviews, reports and literature. This way the researcher will be able to achieve a holistic appreciation of the elements shaping the AI uptake. Moreover, mathematical analysis allows researchers to look for new themes that contribute to a better understanding of the data. Thus, no relevant information is lost. Finally, using thematic analysis, the study may evolve in tones of more advanced and scenario-based findings, which will result in more appropriate recommendations to meet the challenges and benefits of artificial intelligence adoption in the administration of China.

This study's ethics in employing the secondary data would address maintaining originality and crediting relevant sources. Researchers must appropriately credit the sources and original authors of the data and the right to intellectual property because among others uphold honesty and intellectual property. In addition, it should be considered to give a critical assessment of the second source's reliability and consistency to avoid an immoral propagation of inaccurate or biased meanings. Thus, the researcher needs to also ensure the privacy and confidentiality of the data presented in the report, paying so much attention to it, is highly essential (Far & Rad, 2022). In addition, scholars must be careful to ensure that they do not unintentionally misreport or mistranslate the data findings from the secondary data. The upfront disclosure of the shortcomings and the built-in biases in secondary data sources is necessary so that the trustworthy and credible findings of the survey can exist. To sum up, the following ethical principles serve as a guardrail for the ethical and responsible use of secondary data for research activities.

## Findings

### Recent Trends of AI in China

Current AI development in China shows China's aim to acquire higher-level technology and to be innovative. China has occupied itself with the AI leadership project, with the support of major state and non-state investments. There is clear evidence of the growing presence of AI in the different sectors of society like medicine, education, transport, and urban management. AI-powered medical diagnostic systems have gradually become widespread in Chinese hospitals, and as a result, more patients are treated effectively, while healthcare delivery is rapidly enhanced (Thangam et al., 2022). On the other hand, Artificial Intelligence in China has seen an unprecedented expansion of research and developer activities, fuelled by the likes of Alibaba, Baidu and Tencent who are the leading companies in the space. AI companies, with the aid of massive data, develop intelligent AI applications that can go from recognizing voice, and natural language processing, to facial recognition and autonomous vehicles. The flourishing of China's technology-focused business environment alongside a large population and governmental backing for the development of AI has created a very suitable environment for AI innovation and business start-ups.

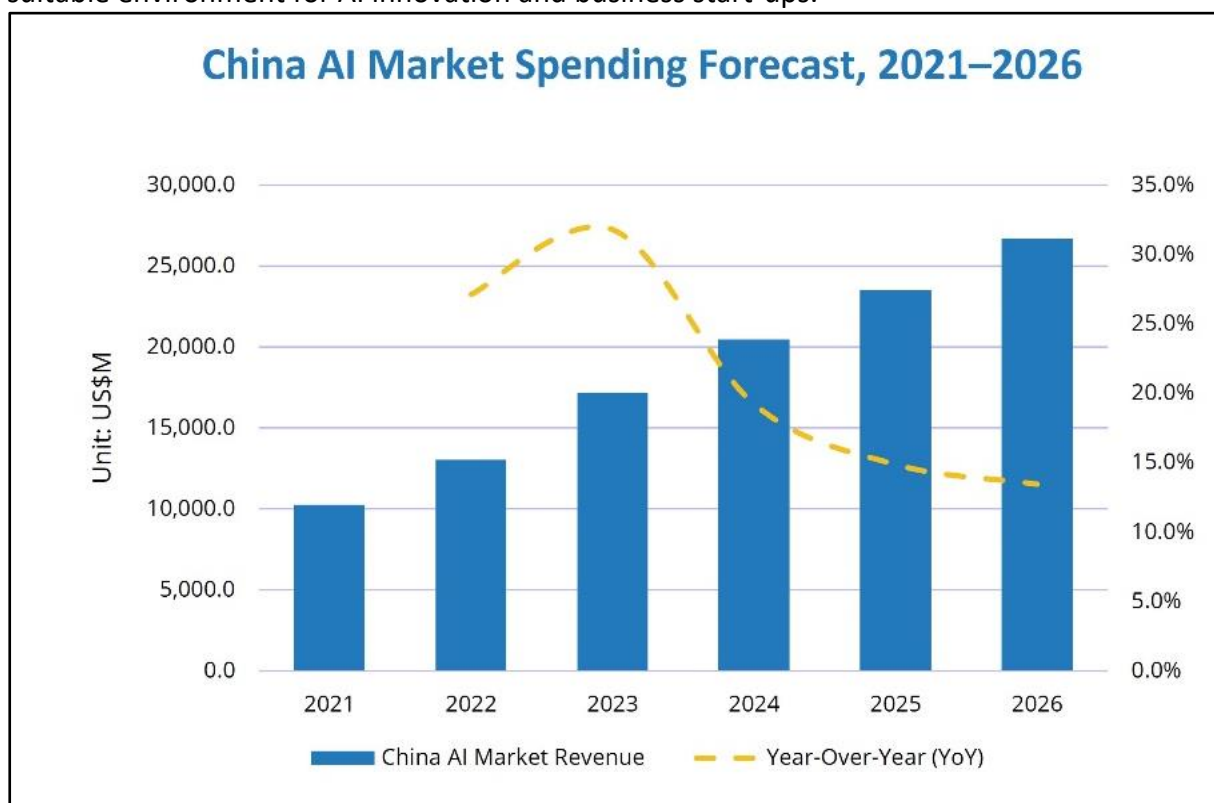


Figure 1: Recent trends of AI in China  
(Source: Thangam et al., 2022)

The other significant trend is the more than increased focus on AI persons training and studying. Understanding human capital as an instrument for AI innovation, China has spent huge money to develop its skilled workforce in AI-related fields. The country runs many universities, labs, and training programs that are artificial intelligence-smart and that train young people. Besides, talent recruitment programs and international collaboration activities effectively retain AI superstars on a global scale and also boost the development of AI in China (Mukherjee, 2022). China, moreover, is seeing AI being used mainly to stimulate economic

growth and national development. The Chinese government has made very clear its intentions of becoming the world leader in AI not later than the year 2030, through several initiatives designed to engender innovative ideas, heighten investment, and expand the application of AI technologies.

On the one hand, this can lead to various opportunities, while on the contrary, it creates some hindrance and reservation in China's AI outreach. These are the societal and ethical issues relating to data privacy, algorithmic bias, ethical consideration and geopolitical tensions. The other aspect in this regard is that the impending use of AI technologies leads to uncertainty regarding society's effects with some of their consequences, like job displacement, inequality, and social disruption (Khogali & Mekid, 2023). Therefore, the recent tendencies in AI in China confirm this country's readiness to usher in the age of AI for economic growth and social development. As China makes impressive progress on the front of AI research, development and application, responding to the related challenges and ethical dilemmas will be pivotal for the positive societal impact of this technology.

### **Challenges in the Adoption of AI in Public Services in China**

With the Chinese public administration facing some major obstacles related to the introduction of AI technology, the latter remains unable to fully realize the desired effect. The primary issue is that advanced robots introduce the dilemma of job displacement. AI keeps developing to the point that it can take over and automate even a large amount of regular work tasks for example some categories of jobs that are situated in manufacturing, transport, and customer service (Benbya et al., 2020). The employment situation after the automation of some human activities may worsen and irrevocably lower living standards for people who have been affected. The question concerning which professions are amenable to automation will be important. As another important impediment to the integration of AI, technical feasibility is mentioned. China has shown determination to capitalize on AI research and development, but obstacles have surfaced in the context of creating a climate that is conducive to the continuity of innovation. Moreover, the absence of a strong data-sharing structure impedes in terms of progress in the development and teaching of AI, because access to diverse data sources is extremely important to effectively train such systems.

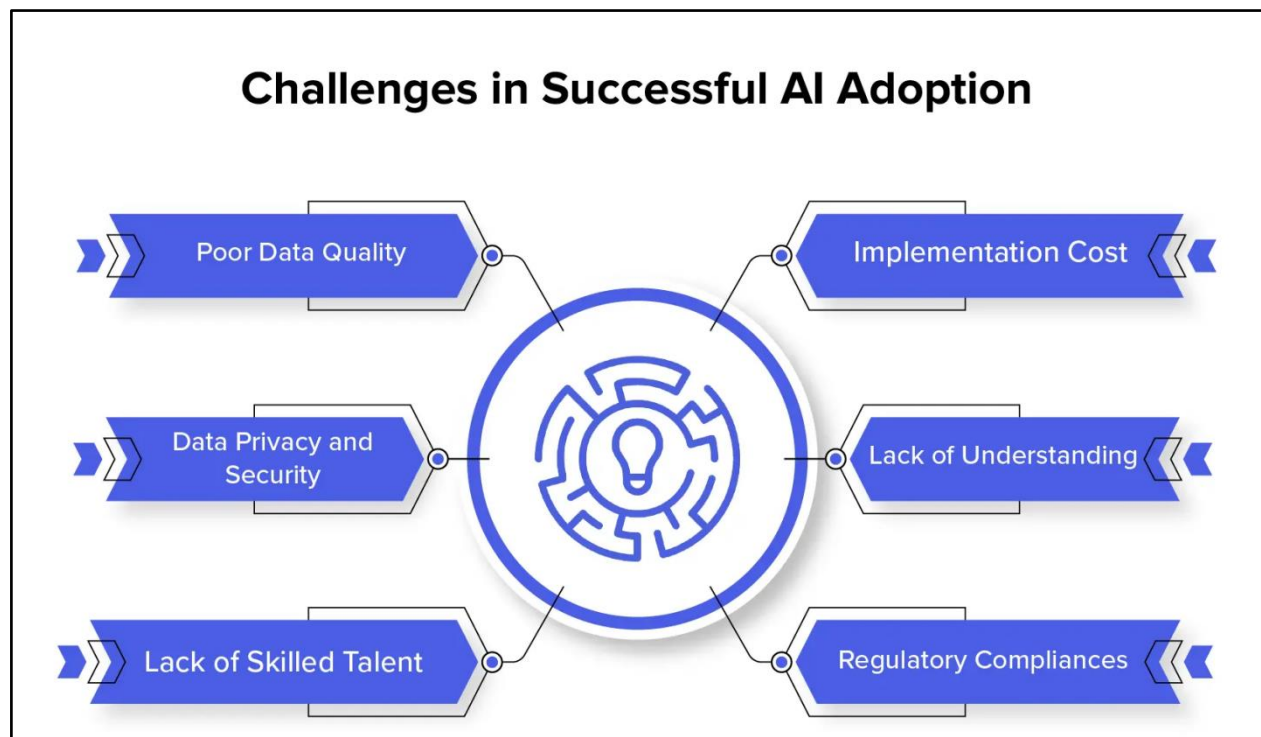


Figure 2: Challenges in successful AI adoption

(Source: Benbya et al., 2020)

On the other hand, the lack of relevant human manpower is a great impediment to the use of AI not only in China but also around the globe. While in the USA, due to the relative shortage of data scientists with over a decade of experience, companies face a problem of finding a sufficient number of talent, China has severe difficulties meeting its requirements for AI experts (Li et al., 2021). Adoption of AI technologies may also be a source for deeper income inequality, by creating a premium for digital skills but leaving the scope for the reduction of demands for low-skilled and medium-skilled workers. AI's ethical and social worries only help build more challenges around it. The dislocation of workers by AI technologies gives rise to moral issues regarding work security and the betterment of social ties. Likewise, other matters about data privacy, algorithmic bias, and legal liability are imposed by adopting AI.

The solution to these obstacles lies in a holistic policy that is integrated and takes into account the technological and economic aspects of this problem. Government policies are fundamental to building up an environment that favours AI into being broadly and extensively used and initiatives like bridging the AI talent gap and promoting the data-sharing mechanism are vital for AI growth in China (Dwivedi et al., 2021). Collaboration between government, business, and academia is the necessary precondition for sending AI technologies into public services on an ethical and fair basis.

### Impact of AI Adoption Challenges on Efficiency and Performance

A major problem related to introducing AI to the process of delivering public services in China is a drop in efficiency and performance among the sectors. There could be a displacement of some jobs which as a result dents workforce dynamics. AI advances will start to substitute routine and automated tasks, that may threaten the employment of low-skilled workers (Nissim & Simon, 2021). Consequently, leaders of organizations will encounter a reduction in

overall productivity and efficiency levels, since the nature of the workforce will involve a frequent need for adjustment. To worsen the matter, the lack of skilled AI talents in the workforce adds to these efficiency problems. Without a relevant workforce with a bearing on AI technologies, companies might not succeed in putting into place and optimising AI systems to the best of their ability. This can result in inefficiencies in AI deployment, hindering the potential benefits of automation and data-driven decision-making.

Additionally, technical feasibility problems that arise from the data availability and quality may deteriorate the performance of the AI system. Lack of good quality data may badly hinder the ability of AI algorithms to deliver the best results that are less biased (Cheng et al., 2021). In this case, the lower quality of the product may become a result of it. Such requirements come from the standpoint of personal data as well as data protection, which might result in uncertainty of making data available for training, and consequently decrease the system performance. Along with that, various ethical aspects related to emergent AI use often centre around productivity and work efficiency. The example of AI technology footprint being embedded with human factors implies that the aspect of bias and fairness is being questioned, thus all new systems of AI will no longer be used to a smaller extent. By extension, these regulatory matters and legal liabilities might prove to be the lawful restraint that can limit a company's use of AI technology in its quest to be efficient and effective.

Further, AI's deployment in China's public service sector does not only display the efficacy side but also other fields concerning the performance of AI. Overcoming these issues requires collective efforts involving governments and scholars to come up with good policies, train workers who will use AI, prepare good data and to consider ethical and social issues (Dwivedi et al., 2021). In this way, the Institutions will navigate these obstacles and then climb down AI for the great purpose of bettering service delivery and innovation.

### **Certain Ways for the Successful Adoption of AI in the Public Sector in China**

Successfully incorporating AI into the public sector in China calls for a systemic plan that identifies the challenges as well as takes advantage of available opportunities to implement AI successfully. The foremost strategy is to target the development of AI in terms of skills and education. AI systems that are effectively integrated into organizations require skilled workers with technological competencies to get over the deficiency of AI talents and the delivery of the processes (Mukherjee, 2022). However, formalizing supportive mechanisms, such as collaboration and partnerships between governments, organizations and academia, is also a crucial point for the adoption of AI in the public sector. Unlike opting for individual approaches, stakeholders can collaborate in working together to share resources, which include expertise and best practices of the trade, as a result of the transfer of knowledge.

Besides, writing detailed regulations and rules for AI use is also important in the context of the rightful and reasonable use of AI. Strict regulations are significant in addressing data privacy issues, algorithmic discrimination along with legal liability, thus providing an ideal situation for AI development and implementation (Rodrigues, 2020). In addition, the act of advancing data sharing and interoperability among the different levels of government and departments can facilitate the transmission of data and better its quality for AI projects. By eliminating data silos and enabling data exchange, enterprises become fully oriented towards using AI for intelligence insights and making more information-driven decisions.

Overall, together with infrastructural and technological investment, these are key supports to enable AI adoption in the public sector. The infrastructure of the IT system can be enhanced by procuring the cloud computing infrastructure and using AI-ready hardware and software



solutions that are compatible with each other and also scalable (Seidelson, 2021). Generating an innovative and experimental environment can help the public sector achieve AI development. Promoting, accepting, and compensating for risks, and errors as learning opportunities and innovation are tools that can be used to overcome the resilience to change and to accelerate the implementation of AI solutions. In general, through allocating resources towards talent development, forging together, implementing suitable regulations, advocating for the use of data, investing in infrastructure, and creating an innovative climate, China could effectively adopt AI in the public administration and be of service to implementing innovation, simplification, and delivery efficiency.

### **Discussion**

In the discussion section, the researcher brought up the latest developments, difficulties, burdens brought about, and a few measures of the implementation of AI in public organizations in China. It finally turns its critical eye to the findings that have been exposed in the previous sections and picks out the most important insights and resulting policy matters for policymakers, industry leaders, and other stakeholders. While addressing recent tendencies, the strategic plan of China to grow AI by way of high investments in the area and crossing sectors is demonstrated. The fact that AI tools are created to improve the healthcare, education, transportation, and urban systems doesn't only mean an increase in the quality of service, but also it is a great opportunity for development on all fronts. Major tech companies from Alibaba and Tencent to Baidu are leading this innovative wave of technology, tapping into a vast data resource together with intense government support to nurture AI development. The AI strategy is designed not only to create a talent base but also to educate the population to generate a workforce that is capable of sustaining AI development and innovation.

However, even though these chances are obvious challenges can be still found in artificial intelligence in public services. The growing automation of workplaces overshadows a whole category of jobs, which in turn leads to income distribution disparities and a lack of job security. Technological issues related to data access and quality, together with labour shortage, as two major obstacles to the rapid pace of AI adoption, impede the industry development. Ethical and social dimensions in AI integration, for instance, data protection and bias in algorithms, entail extra complexity for adoption. The effect of those problems on the missing functions and efficiency is diversified. Workforce disruptions; as well as talent shortages impede the effectiveness of organizations and their productivity. The performance of AI systems is stilted by technical feasibility problems resulting in fewer satisfactory outcomes and the long-run loss of public confidence. Furthermore, ethical and social concerns place barriers by setting regulatory restrictions and giving legal liabilities that in the end do not let AI fully reach its potential to promote efficiency and innovation in public services.

To tackle this issue, accordingly, some specific approaches are presented for the smooth disclosure of AI in the public sector of China. A significant amount of resources (investment) should be allocated for the development of talents and education to reduce the AI skill gap and facilitate the utilization of AI systems skillfully. Collaboration between government bodies; the industrial sector; and the research sector is vital for the betterment of knowledge dissemination and AI deployments. A solid regulatory mechanism that provides direction on ethical and legal issues is needed for AI innovation to be sustained and the environment to be favourable. Besides, the integration and the exchange of data could enhance the access to

information of AI applications and the enrichment of their findings and the quality of the decisions. Along with investment in infrastructure and technological capacities, more AI adoption is possible because it grants smooth integration of AI solutions that are scalable. Regarding this, embracing the culture of innovation and experimentation implies risk-taking and incites innovation, which is a process to resist change and supports the adoption of AI-based solutions.

Thus, the discussion critically judges the recent tendencies, problems, influence, and certain ways of the successful introduction of AI in the public sector in Chinese through the prism of the given items. It emphasizes the possibility of AI being a revolutionary force that can modernize public service delivery, engender economic growth, and enhance social welfare. Alongside these benefits, the path to achievement is riddled with challenges, thereby calling for calculated action to tackle them and seize opportunities. By putting talent first, encouraging teamwork, clarifying regulation, leading data sharing, investing in infrastructure and creating an innovative culture, there is a way for China to implement AI in the public sector to its maximum capacity.

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