

AI FOR THE PUBLIC SECTOR

V S RAMESH BABU BATCHU

Research Scholar

Department of Computer Science and Engineering
JS UNIVERSITY, Shikohabad ,Uttar Pradesh.

Dr. K. VIJAYA BHASKAR

Associate Professor

Department of Computer Science and Engineering
JS UNIVERSITY, Shikohabad ,Uttar Pradesh.

ABSTRACT

In order to implement policies and create efficiency in highly unpredictable contexts, public sector enterprises are showing a growing interest in using data science and artificial intelligence capabilities. Incorporating data science and AI into delivery systems to execute policies is crucial to their long-term success in the public sector. Nevertheless, governments cannot accomplish this task of integrating AI into the delivery of public services alone. Universities, together with the public and commercial sectors, must work together to meet the AI grand challenge, according to the UK Government Industrial Strategy. All throughout the globe, applied AI centers of excellence follow this model of cross-sectoral collaboration. Collaborations across sectors are becoming more common, but they face significant managerial obstacles that prevent them from reaching their full potential. The paper delves into the pros and cons of AI for government agencies. At last, we provide a set of measures to oversee these relationships across different industries.

Keywords: cross-sector collaboration, data science, artificial intelligence, public policy

I. INTRODUCTION

In its Industrial Strategy, the UK government aims to become the most inventive economy in the world. By formalizing their partnership, the government, industry, and academia have set out to accomplish the following goals: improve the country's digital and data infrastructure; create an environment where AI businesses can thrive; and increase national prosperity through the equitable distribution of AI's advantages. This overarching objective is known as the Artificial Intelligence (AI) Sector Deal. A sectoral assistance package of around £1 billion, supplemented by an extra £1.7 billion under the Industrial Strategy Challenge Fund, is detailed in the AI Sector Deal, outlining the commitment of

government, business, and academics as the three partners.

Over the years, governments have increasingly stepped up to the plate, assuming the role of an innovative, entrepreneurial state. The US Defense Advanced Research Projects Agency (DARPA) is a famous example of this kind of program; it created the technology that underpins the internet and personal computers. In the United Kingdom, programs like Innovate UK, SRBI (the Small Business Research Initiative), and The Catapult Programme have shown how this may be put into action.

Events beyond of the three parties' control, such as Brexit, heighten the AI Sector Deal's ambition, but the deal's ultimate success is dependent on their ability to work together. Working together

in this way is now essential to the majority, if not all, entrepreneurial state programs [6]. Several well-known obstacles prevent public sector organizations from embracing data science and artificial intelligence. These include information silos, a shortage of resources, a lack of a collaborative culture, and technological capabilities, as well as employee route reliance on established norms and practices [7, 8]. Three parties must work together to complete the AI Sector Deal. Therefore, it is critical to learn from the successes and failures of other sectors' collaborative efforts in order to comprehend the obstacles and success factors of such cross-sectoral cooperation. To better incorporate artificial intelligence (AI) and data science (DS) projects into public service delivery, this paper compiles previous research on managing cross-sector partnerships and makes a number of suggestions for doing so.

II. Mapping Inter-Organisational Collaboration In AI

Collaborations between governmental, corporate, and non-profit sectors are common in the delivery of public services. Policy networks are an example of a less formal arrangement, while public-private partnerships are an example of a highly structured enterprise. The fundamental idea behind them is to combine the talents of all parties involved in order to make a certain public service more efficient and cost-effective. Especially in Europe, cross-sector cooperation has become more important in recent years.

In the field of artificial intelligence and data science, there are already trilateral cooperation agreements that provide the body of information. One example is the professorship in public policy and data science that the University of Essex and Essex County Council established. This individual will serve as the Chief Scientific Adviser to the Council and will be based out

of the Institute for Analytics and Data Science (IADS) in the School of Computer Science and Electronic Engineering. IADS is a state-of-the-art facility at the University of Essex that facilitates collaboration between academics, companies, and public and private organizations working on artificial intelligence. The partnership's overarching goal is to provide services to the Essex community by combining public sector data and resources with academic and corporate artificial intelligence knowledge.

The motivations for forming partnerships are driven by the advantages of using AI. Among these advantages are the following: the ability to foresee and plan for service demand; the automation of demand-side response; the identification of high-risk groups and the development of targeted interventions; the increased efficiency, productivity, and cost-effectiveness of product production; the promotion of products and services to the right people at the right price; and the provision of an enhanced, personalized, and hassle-free experience for customers.

Improving the delivery of public services and reducing administrative hassles are the social advantages of such alliances. To illustrate their point, Essex County Council collaborates with schools to identify at-risk students and devise early-stage interventions to help them stay in school or the workforce. The council predicts that 14-year-olds will be NEET (not in education, employment, or training) by the time they turn 18. The Behavioural Insights Team of the UK Cabinet Office demonstrated how to evaluate social care referral and assessment notes in order to forecast closed case escalation, or the number of cases that will reenter the social care system. The government may prove its worth as a caring service provider by finding ways to deal with paperwork, backlogs, and limited resources in a way that saves time, money, and effort. One example is the 'Education Dominance' initiative at DARPA, which

employs AI to build a digital tutor that models novice-expert interaction using machine learning. This shortens the time it takes for Navy recruits to become technical experts from years to months. This increased the chances of program recruits getting high-paying IT employment and caused them to beat specialists with 7–10 years of expertise.

III Challenges and Opportunities of Cross-Sectoral Collaboration Around AI

We conducted a literature analysis to examine the management practices impacting collaboration arrangements in various industries. An electronic search in the Google Scholar database was used as the search approach to discover qualifying studies. *Journal of Public Administration and Theory*, *Public Administration Review*, and *Public Management Review* are widely considered to be the top three journals in the subject of public administration and management. We have chosen to focus on publications published in these journals as our publishing criterion. Results for the search that were returned were "collaboration performance," "collaboration success," "network performance," "network success," "joint venture performance," and "joint venture success." After adding the journal filter, we were able to narrow the results down from 7,885 to 156. The next step was to include 84 publications in the review after examining their titles and abstracts for the required phrases. Research on what makes cooperation, networks, and joint ventures work, as well as studies that provide empirical data in the form of case studies, questionnaires, or other research designs, were also retained after applying a "study design" filter. In order to summarize each piece, we looked at the following details: year of publication, title, journal, success factors, effectiveness determinants, and management methods that contributed to the success. In order to extract the factors

that contributed to success as found in the empirical research, we narrowed our search to papers that included the keywords 'success' and. Using an inductive analytic method, we retrieved the primary elements impacting the success of joint ventures from the chosen research. Problems with effective teamwork. There has been a lot of study on the problems with working across private, public, and nonprofit sectors, but somewhat less on the problems with working across private, public, and nonprofit organizations. Research by scholars like Stoker et al. has centered on the idea that building social capital may help with cross-sectoral collaboration problems that stem from actors' perceptions of each other's relational capacities. Also, Innes et al. have shed light on the advantages of network structures in environmental policy, namely how they may self-organize and adapt to overcome the limitations imposed by conventional bureaucratic-based institutions.

It has long been believed that one of the primary difficulties in creating joint ventures is overcoming competing institutional logics. Some have compared the logic used by public organizations to that of a state, whereas private organizations use a hybrid of market and corporate principles. The authors reveal that shareholders in partnerships "conflate their role as businessmen, as they are accustomed to operating under the Corporate logic within their companies" with their experience as shareholders, which invokes the market logic. In reality, this affects the consensus on the collaboration's necessary objectives. Managers of joint ventures may face double-edged swords: they must optimize revenues to appease private partners' shareholders while simultaneously providing public value for money. The collaboration's success is also influenced by the combination of various organizational systems. Due process demands strict adherence to the letter of the law, which is

why public sector organizations are traditionally thought of as rule-oriented. Rainey argues that private companies are seen to be less constrained by bureaucratic supervision as they are not beholden to the same kind of political accountability demands.

It has been shown that when strategic cooperation entail opportunism, the organizational values of the parties engaged tend to differ. Because various sectors are associated with distinct sets of values, this is especially important when working across them; for example, public servants have a stronger incentive to help the public good, while private sector personnel have a stronger incentive to advance their own company's interests. When governmental, corporate, and nonprofit organizations work together on a project, the biggest obstacle is getting everyone involved to stop thinking about "us" and "them" and start thinking about "we." This is because different sectors' ideals often clash. Take university-public sector forms as an example. While most cross-sector collaborations in AI and data science revolve on procurement or outsourcing, these collaborations provide a chance to bring together different organizations via shared missions. Given the 'social good' character of projects focused on solving societal issues, it is believed that these initiatives will bring organizations with similar ideals together.

Building on this idea, Healy says that recognising 'substance and procedure' as 'co-constituted, not distinct domains' helps bring together the disjointed principles in collaborative governance. The participation in the process of governance "forms participants' sense of themselves; and generates ways of thinking and acting that may be carried forward" when a social order is established. One of the primary responsibilities of public sector managers is to find ways to address the value dilemma.

As an example, the White House Police Data Initiate experiments with machine learning methods that analyze audio and video material from body cameras via inter-organizational cooperation (e.g., interaction with academics, technologists, and police agencies). Here, the data shown by body cameras facilitates the exchange of information among many stakeholders, such as researchers from Stanford University and the Oakland police department, regarding the pros and cons of this strategy. The process of exchanging information and ideas leads to the development of social and relational substance, which in turn bridges the gap between individuals and institutions in order to promote common ideals and take action.

The General Data Protection Regulation (GDPR) and the UK Data Protection Bill provide legislative clarity on data sharing and usage, as well as fair and transparent AI applications; moreover, the creation of a Centre for Data Ethics and Innovation will contribute to the safe and ethical use of AI. Concerns concerning AI's ethical usage and fairness in sharing and using the technology are important, but unintended consequences can arise from issues like safety as more "AI [is used] to control physical world equipment" and the "consequential decisions about people" that humans make when they transition to AI. In particular, the paper expresses worry on the response of machine learning systems to the "complexities of the human environment" and the methods to be used to guarantee accountability, justice, and fairness in these decision-making processes. In the criminal justice system in particular, organizations like the Centre for Data Ethics and Innovation must persistently advocate for the use of comprehensive and impartial data. On the one hand, data analytics have the potential to "predict and detect bias and prevent discrimination." On the other hand, there is a danger of "hardwire

discrimination" and "exacerb[ing] problems of bias into these new technological interfaces."

B. Collaboration success factors Leaders of collaborations should encourage wide-ranging engagement, guarantee wide-ranging influence and control, facilitate fruitful group dynamics, and broaden the process's scope, according to a meta-analysis of literature on the management of collaborative governance by Ansell and Gash. In a collaborative setting, there are four types of leaders: the convener, who makes sure everyone knows their part and follows instructions; the catalyst, who gets people excited and makes sure they know who owns what they do; the mediator, who acts as a broker and helps people talk to each other; and the bridge builder, who connects goals at different levels and makes sure everyone stays on the same page politically. Organizational success in the public sector has been favorably connected with the formulation of the organization's goals, which highlights the importance of shared objectives. Among the many benefits of GIS is the fact that its members are able to share their expert knowledge of data and technological operations and keep in close touch with one another throughout regional transportation planning activities. According to Nesta, building inspectors have first-hand knowledge of what makes a typical HMO, so they should be consulted when developing an algorithm to identify unlicensed "House(s) in Multiple Occupation" (HMOs) in the City of London. This will help the Greater London Authority and data science experts with their project.

- Communication: They begin by outlining the attractor effect, which happens when stakeholders are more eager to put in time, effort, and money because they see the cooperation as leading to real results. Employees' performance improves when they can witness the direct influence of their

work on real people, according to the beneficiary contact study. This conclusion appears to hold true when it comes to socializing as well. It may be more challenging to execute a top-down plan in a decentralized context, but new ideas and improvements may be encouraged throughout the partnership with transparent outcomes and metrics. Knowledge transmission, reception, and integration are all impacted by the manager's mindset, which in turn dictates the decisions about the analytical tools and tactics that are used. Utilizing the host of data legacy managers currently working in government, such as GIS teams, may help managers address institutional preparedness issues by providing a plethora of knowledge and tactical experience.

- Making sense: the successful completion of various administrative tasks as a result of providing adequate primary care medical services. Her case studies show that ordinary GPs' cooperation is crucial to towns' ability to handle problems like patient security, but that GPs are interested in the network since it gives them a voice in municipal decisions affecting their field.

IV CONCLUSION

With the help of AI, the United Kingdom might become the most inventive economy in the world. The government is anticipated to adopt a proactive stance in innovation policy by forming cross-sectoral partnerships with companies and academic institutions if the UK is to realize the economic and social benefits of artificial intelligence. Collaborations of this kind are already popping up in countries all over the world, including the UK. Take the University of Essex's Institute for Analytics and Data Science as an example; its mission is to revolutionize Essex's public services using artificial intelligence. Although we have little experience with AI collaborations,

we do have extensive knowledge with projects of a similar kind across several industries. Collaboration between public, commercial, and non-profit entities to provide public services has well-known potential advantages. However, these advantages are not exclusive. We should be cognizant of the enormous management complexity and its detrimental influence on the efficacy and cost-effectiveness of cross-sector partnerships, according to the available data from such joint endeavors. Despite these challenges, there is mounting evidence that collaborative enterprises are being used more and more to implement public policies all around the world [28]. Nonetheless, they do add to the reality that these organizational models fail to provide the expected outcomes in a number of instances.

To make the most of the AI Sector Deal's proposed cross-sectoral cooperation, it's important to look at what other businesses like yours have done well. To sum up, our research shows that cooperation thrives when leaders use a facilitative approach. One of the most important things for a partnership to succeed is for everyone involved to have the same aims and objectives. Managers may take use of the representation of knowledge via the establishment of agreed standards to encourage joint-action for institutional and technical capacity growth, which is especially important when organizations from various sectors interact. When addressing the potential benefits of data science and AI for a specific project, it is essential to have a clear plan for how everyone involved in the collaboration will be informed and communicated with. This will ensure that everyone's interests and expectations are aligned. A fundamental component of successful cross-sectoral cooperation is socialization. This implies that, despite the technical challenges of executing data science and AI efforts, policymakers should consistently

communicate the public benefit that the program or policy seeks. Incorporating alternate dimensions to issue solutions is essential for quality, and expert insight may help with that. Last but not least, the many tools for public

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