AI and Public Policy Process: Between Efficiency and Ethical Challenges

Andi Muhammad Farid Fausan Bate[1], Andi Pajolloi Bate[2]

[1]Political Science and Public Administration, Faculty of Political Science,
Sakarya University, Sakarya, Turkiye
faridfausan@gmail.com

[2]Faculty of Communication Science, Universitas Mercu Buana,
Jakarta, Indonesia andi.pajolloi@mercubuana.ac.id

*Andi Muhammad Farid Fausan Bate

Abstract

The presence of Artificial Intelligence (AI) as one of today's technological products has become a game changer in nearly every sector, reforming and transforming how we conduct our lives, including in the field of public policy with the efficiency it offers. However, the involvement of AI in this sector also brings about significant challenges, particularly ethical concerns. Using William Dunn's Policy Cycle Framework, this study aims to analyze the potential role of AI in driving efficiency at each stage of the policy process. In addition, ethical concerns, as a major challenge, will also be addressed. This research adopts a qualitative approach by extracting data from a range of academic literature and policy reports. The findings suggest that if policymakers can optimize the various features offered by AI systems, AI has significant and crucial potential at every phase, from the agenda-setting stage, which aims to establish a priority scale for public agendas, to the evaluation stage to assess the outcomes of policy interventions. Nevertheless, ethical concerns remain an ongoing issue and a source of complexity and dilemma. Ultimately, this study contributes to providing a fresh perspective on the integration of AI in the public policy sector, demonstrating how its presence can align with the iterative and non-linear nature of the policy process, as well as address the fundamental ethical issues in its application.

Keywords: Artificial Intelligence, Efficiency, Ethics, Public Policy, Public Policy Cycle,

1. Introduction

In today's increasingly advanced world, filled with various dynamics, one thing we must understand together is that the innovations occurring in technology have visibly reshaped and reformed the landscape of our lives across various sectors, including in the field of public policy. For instance, the advent of social media, one of the most closely related technological products to our daily lives, according to **Sun & Medaglia (2019)**, has provided wide access to the rapid dissemination of information and the ability to mobilize public opinion, which will significantly affect the political agendas being developed by political actors. Social media, as the authors argue, becomes a relevant source of data for observing on-the-ground conditions. The ability to accurately analyze trends and sentiments through data analysis will assist policymakers in precisely identifying emerging issues, which will later shape the public agenda **(Couture et al., 2023).**

The presence of technology in public policy has increasingly opened up space for society to voice their concerns. Through technological advancements, specifically virtual spaces created and other products like online consultation platforms and electronic surveys, **Firman et al. (2024)** argue that these can effectively facilitate public participation. **Schroth et al. (2020)** emphasize that participatory agenda-setting, which involves utilizing technology and engaging various stakeholders

related to the public policies to be implemented, has proven to strengthen the legitimacy and responsiveness of these policies. The integration of public input through these digital spaces enables the government to implement more accurate and relevant public policies that align with the needs and preferences of the society they govern, ultimately promoting a more democratic governance structure **(Rosa et al., 2018)**. Furthermore, technology also enhances the effectiveness and efficiency of decision-making processes. The capability of technology to collect and analyze data enables decision-makers to base their decisions and policies on real-time data **(Tilahun et al., 2015).** High-quality public services, a reflection of effective governance, will significantly influence public trust in the government **(Chaeruddin, 2024).**

When discussing technology, we cannot overlook one of its most impressive products today: artificial intelligence (AI). The presence of AI accelerates and intensifies the impact of technology in all areas, including public policy formulation and implementation. **Sun & Medaglia (2019)** argue that AI can automate cognitive tasks, improve predictive capabilities, and expedite and enhance service delivery in public administration processes, ultimately leading to significant improvements in government efficiency and effectiveness. The utilization and maximization of AI in the public sector hold substantial potential to enhance and accelerate decision-making processes, assist in service delivery, and address various complex social issues **(Wirtz et al., 2018).** Moreover, AI can play a crucial role when governments face crises, such as the COVID-19 pandemic. According to **Katekar et al. (2023)**, AI played an essential role in improving COVID-19 management in India. AI applications, they argue, significantly improved disease surveillance, diagnosis, treatment, and public value creation. Since policymakers face rapidly evolving challenges daily, the potential of AI as a tool to support every stage of the policy formulation process cannot be overlooked and deserves serious attention.

One of the theoretical frameworks that can be used to examine the public policy formulation process is the Policy Cycle theory by William Dunn. William Dunn is widely recognized as one of the most influential public policy scholars, continuously contributing significantly to the development of the field, with his relevance remaining intact both in the past and for the future **(Hanson et al., 2022)**. Dunn provides a well-thought-out and proportional understanding of policy analysis. **Dunn (2017)** emphasizes that policy analysis, methodologically, is eclectic, meaning that practitioners have the freedom to choose from various scientific methods, both qualitative and quantitative, as long as the knowledge produced is reliable. In this context, policy analysis encompasses art, skill, and persuasion, all of which can be considered scientific, provided they successfully generate reliable knowledge **(Dunn, 2017)**. Dunn's framework on public policy emphasizes a systematic approach, from the analysis and evaluation processes to providing a structured understanding of how a policy is formulated, implemented, and evaluated.

Unlike the traditional understanding of policy formulation as a linear process, **Dunn (2017)** views the stages in the process as non-linear, constantly interacting with one another. Policy issues are fluctuating, political actors continuously propose and adopt new solutions, and policymakers make decisions (and provide feedback on their success) while implementing these policies. The evaluation of policy success is not a one-time document, and previous policies can influence and set the agenda for new ones. In other words, these stages are interconnected, mutually influencing, and continuously interacting.

Although Dunn rejects the traditional approach that sees the public policy process as rigid and fixed, he still emphasizes that there are fundamental stages in the public policy process, which are interconnected. **Dunn (2003)** outlines these stages as follows:

- **Agenda Setting** : Administrators and officials begin by introducing key issues to the public agenda, competing with other issues.
- **Policy Formulation** : At this stage, several issues that have entered the public agenda are clearly defined, and various alternative solutions are sought to address them. These alternatives compete, and the most effective solution is eventually selected.
- **Policy Adoption** : From the alternatives, one is chosen and adopted based on majority legislative support, a collective consensus, or judicial decisions.

- **Policy Implementation** : The chosen policy is implemented by administrative units with the authority to manage financial and human resources.
- **Policy Evaluation** : At this stage, the implemented policy is evaluated to determine its usefulness and impact. Various measures and parameters are set to assess whether the implementation and outcomes align with initial expectations.

As previously explained, AI has arrived with all its potential and benefits in various sectors, including the public sector. However, we must not overlook the various challenges and issues that may arise from this matter because AI, like other technological products, is a double-edged sword, presenting both challenges and threats. The presence of AI in the public sector may face challenges such as resistance from stakeholders **(Sun et al., 2019)**, ethical issues, accountability, transparency, and fairness **(Wirtz et al., 2018)**, as well as privacy concerns, consent, and discrimination **(Anshari et al., 2022)**, among others. Every stakeholder must be aware of these challenges and strive to prepare for them to optimize AI utilization in the public sector while minimizing risks.

The novelty of this research lies in its unique combination of the role and transformative efforts of AI in the public policy formulation process using the Policy Cycle framework proposed by William Dunn to provide a structured understanding of how AI can revolutionize each stage. While existing studies focus on the general application of AI in government and public policy processes, this research aims to specifically integrate AI's capabilities to promote the effectiveness and efficiency of public policies with the inherent nature of Dunn's Policy Cycle theory, particularly its iterative and non-linear characteristics. This paper is significant and important because it will demonstrate how the presence of technology, specifically AI, can be used to maximize public service processes, helping to create data-driven, effective, relevant, and efficient policies that are ultimately accountable. This paper can serve as a reference for stakeholders, especially policymakers, on how to integrate AI into the public sector while considering the potential and negative impacts. With AI as a tool that is accompanying our lives today, it is crucial for policymakers to actively maximize its potential for the benefit and well-being of society, and this paper aims to provide a practical perspective on this issue.

Furthermore, the research question of this paper, which we will address and analyze, is: How does the presence of artificial intelligence drive the public policy formulation process within the framework of William Dunn's Policy Cycle theory? how do ethical concerns pose challenges and threats that may arise during its implementation?. Furhermore, the main objective is to explore how AI can support and assist in every stage of the public policy cycle, from agenda setting to policy evaluation, and to identify and explain ethical concerns as a key challenge in integrating AI into the public policy sector.

2. Method

This research employs a qualitative research method to explore the role of AI in each stage of the public policy formulation process, analyzed using the Policy Cycle Framework by William Dunn. Firstly, key data is gathered from various academic journals and government reports that explain the utilization of AI in public policy-making processes. Additionally, several case studies are conducted to provide practical insights into AI applications. Furthermore, relevant books, articles, and publications discussing public policy and artificial intelligence are collected to strengthen the theoretical foundation of this research. Secondly, the collected sources and data are organized and thematically coded to align with the five stages of the public policy process according to Dunn, ranging from agenda-setting to evaluation. Patterns related to AI applications in each stage are then analyzed, identifying opportunities and finding the ethics related challenges.

The Policy Cycle Framework by William Dunn is chosen by the author to structure the analysis due to its focus on the inherent characteristics of public policy processes, namely, their iterative and nonlinear nature. This approach provides a conceptual understanding of how AI can assist in the dynamics between stages of the policy process. The theoretical framework is practically applied by mapping the collected data into each phase of the established procedure. The author believes that this theoretical framework is highly appropriate given the complexity of today's

political realities. The public policy process, from agenda-setting to policy evaluation, is a long, intricate, and highly dynamic series of events. Therefore, Dunn's framework, which emphasizes iterative and nonlinear characteristics, is the most suitable theory for this research. The qualitative approach is also adopted to offer in-depth, flexible, comprehensive, and contextual exploration to address the research questions.

3. Result and Discussion
The Way AI Enhance Every Stage in Public Policy Process

A. AI in Agenda-Setting

A number of studies collected by the author emphasize that the utilization of AI can significantly be used to read the aspirations and expectations of the public, as well as the issues or topics that are currently being widely discussed. **Sukhwal et al. (2022)**, through their research, demonstrate that AI can be utilized to analyze data collected from social media to assess public sentiment and identify emerging social issues, particularly in the context of responses to the COVID-19 pandemic that occurred recently. **Du et al. (2017)** also confirm through their findings how sentiment analysis based on machine learning can assess public sentiment regarding HPV vaccination by collecting data from Twitter. Furthermore, the argument that AI can be a highly effective tool for reading developing issues by analyzing public sentiment on social media is supported by the findings of **Boon Itt et al (2020)**, who found that sentiment analysis on Twitter during the COVID-19 pandemic effectively revealed public concerns and provided insights into public awareness of emerging discussion topics. Thus, AI will be able to become a game changer. By analyzing public sentiment, absorbing public aspirations, and ultimately providing the basis for policymakers in setting public agendas, AI will play a crucial role in this process.

B. AI in Policy Formulation

After the agenda-setting stage, policymakers, according to Dunn's policy cycle theory, will formulate various policy alternatives. The issues that have been identified as public agendas will be addressed with different solutions and policies to meet the demands and expectations of the public. In this process, AI can play a significant role in several ways. First, **Martino (2023)** explains that AI enables policymakers to conduct predictive modeling and simulations, which ultimately gives the government the opportunity to predict the potential impacts of various types of alternative solutions or policies available. This argument is further reinforced by other findings. In policy formulation, **Zhu (2024)** explains that governments are routinely required to estimate the costs, benefits, and impacts of policy choices. In this phase, AI's ability to predict various scenarios becomes highly beneficial and powerful, as it not only predicts costs and benefits but also estimates the potential implications of each choice **(Zhu, 2024)**. Therefore, to reiterate, AI's role in the policy formulation process is to conduct modeling simulations, provide predictions of various impacts, and offer the best alternatives to address the issues at hand.

C. AI in Policy Adoption

One of the most fundamental issues in the process of adopting policies or making public decisions is conflict of interest. **Boyce et al. (2009)**, in an article titled "Conflict of Interest in Policing and Public Sector," explain that conflict of interest negatively impacts the policy adoption process or decision-making in the public sector. In this context, AI can play a vital role due to its ability to provide more objective policy recommendations based on data and evidence. In an article written by **Shrivasta (2023)**, titled "The Role of Artificial Intelligence in Enhancing Public Policy," he explains that in the face of an increasingly fast-paced world, the public expects policymakers to make significant decisions with the help of vast knowledge, relevant data, and an understanding of complex information. AI, according to **Shrivasta (2023)**, comes with analytical tools that meet these expectations and needs. Additionally, **Martino (2023)** shows that AI's advanced automation capabilities significantly

accelerate the decision-making and policy adoption process by providing instant and rapid access to data sources and analysis results. Thus, the process of choosing one among many alternatives, using artificial intelligence, will be more objective as it is based on analyzed data, minimizing conflicts of interest, and can be carried out with better acceleration than before.

D. AI in Policy Implementation

After a policy alternative is agreed upon, the next stage is to implement it, translating it into real-world applications that are expected to address societal issues. **Eggers et al. (2017)** and **Mehr (2017)** assert, based on their findings, that various AI applications such as "AI Process Automation," "Predictive Analytics," "Virtual Agents," and "Cognitive Robotics" are crucial for improving efficiency and saving costs in bureaucratic processes by automating processes, helping allocate available resources, and reducing wait times and administrative burdens. **Wirtz (2018)** similarly states that in the implementation process, AI significantly enhances efficiency due to its capacity to automate routine and repetitive tasks, which ultimately allows public officials to focus more on more complex tasks and responsibilities. This increased efficiency in public service and policy implementation will, of course, be highly beneficial to society. A real-world case can be found in articles by **Chun et al. (2007, 2008)** that address service-based applications in public administration processes, optimizing immigration forms using AI technology. This AI-based service has been shown to significantly reduce the workload of employees, shorten the required processing time, improve workflow efficiency, and ultimately contribute to economic growth **(Chun et al., 2007, 2008).**

E. AI in Policy Evaluation

The final stage in the public policy process is evaluation, which aims to assess the outcomes of the policies that have been implemented. At this stage, an assessment will also be made to determine whether a policy should continue, be revised, or be terminated. **Dunn (1981)** explains that the evaluation process provides accountable information related to policy performance, in terms of how well the needs, values, or opportunities have been achieved through a public policy. The evaluation criteria can be divided into several, including; effectiveness, efficiency, sufficiency, equity, and responsiveness **(Dunn, 1981).** In this stage, AI plays a significant role in creating an environment where real-time policy monitoring is available, which will undoubtedly provide better insights into the policy process, assess timely and accurate data related to policy interventions, and make it easier to swiftly adjust policies if necessary **(OECD, 2019).** Furthermore, AI can also be used to analyze public sentiment, as in the agenda-setting process discussed earlier, supported by findings from **Sukhwal et al. (2022), Boon Itt (2020),** and **Du et al. (2017).** This sentiment analysis helps policymakers understand public perspectives regarding policy implementation and use that input for evaluation.

How AI Can Be Integrated with William Dunn's Policy Cycle Theory

As mentioned earlier in the introduction of this paper, one of the key criteria in **William Dunn's (2017)** theory of the public policy cycle is its iterative and non-linear nature, which means that each stage of the public policy process, from agenda-setting to evaluation, does not proceed in a linear fashion and continuously interacts with one another. AI can play a crucial role in enhancing the application of this cycle with the features it offers.

One such feature enabled by artificial intelligence is real-time data analysis. By harnessing the potential of machine learning algorithms, AI-based data analysis enables institutions to quickly extract valuable information from available datasets **(Althati, 2024).** Furthermore, **Milosevic (2016)** explains that real-time analytics is akin to big data analysis, where data elements that have been collected are processed and analyzed as they are entered, in real-time. This real-time analysis allows an organization or institution to respond

instantly to changes in market conditions, consumer behavior, or operational issues **(Chia, 2023).** The combination of AI utilization and real-time data is particularly ideal. When significant changes occur in the public policy process, whether due to operational errors, changes in priorities, or new input from the public, AI can analyze data simultaneously based on real-time information gathered, whether through social media or online reviews. This analyzed feedback can then serve as a foundation for policymakers to decide the next steps: whether a policy needs to be revised at a particular stage, continued, or completely discontinued. Ultimately, the presence of AI, through its real-time data analysis capabilities, will create a more adaptive and responsive public policy process.

AI in Public Sector and Ethical Challenges

One of the most fundamental issues in the discussion about the challenges posed by AI implementation in various sectors, including public policy, is related to AI ethics. **Wirtz (2018)** highlights that a major aspect of this ethical concept concerns the ethics of robots or machines. On one hand, this relates to considerations about whether the development and use of specific AI, along with its consequences, can be justified morally and ethically **(Patrick et al., 2012)**. On the other hand, the debate centers around how we can incorporate the ethical principles that we have collectively agreed upon into AI systems so that, during their use, they can act based on sound moral foundations **(Anderson et al., 2011).**

The application of AI in the public sector is generally understood to aim at improving effectiveness and efficiency while minimizing errors, ultimately leading to the best decisions **(Wirtz, 2018)**. However, since AI systems are not flawless and human misjudgments can still occur, decisions made based on AI might pose a real threat to humanity **(Krausova, 2017).** Furthermore, the decision-making process of AI differs from that of humans. While AI makes decisions based solely on instrumental rationality, humans also involve deep awareness and emotions **(Banerjee et al., 2018).** This instrumentality of awareness and emotion is what fundamentally distinguishes humans from AI. Based on this framework, significant ethical and moral questions arise: is it morally justifiable to empower AI—lacking consciousness and emotion—to govern and make decisions affecting human lives, when humans themselves possess these attributes? **Wirtz (2018)** argues that it would be problematic if rules were changed and adapted too easily just because a machine instructed it. In the future, AI's self-learning feature may lead it to make decisions that are no longer based on normative ethics, ultimately becoming unpredictable to humans **(Wirtz, 2018).**

Moreover, the discussion surrounding AI cannot be separated from the concept of moral dilemmas. A moral dilemma is a situation where an AI system must choose between two or more conflicting alternatives, with the understanding that "no moral choice is without undesirable moral consequences" **(Ditto & Liu, 2012, p. 55).** What happens when AI is confronted with a dilemma between two decisions, both of which have negative implications? **Deng (2015)** emphasizes that such dilemmas are highly relevant in AI applications, where there may be situations in which AI is forced to make an ethical decision between two equally negative alternatives. A potential solution to this issue, as discussed earlier, lies in one of the key debates surrounding AI—how to integrate ethical principles into AI systems. However, challenges will persist, one of the greatest being identifying what is best and relevant for AI so that these systems can reason correctly in situations involving ethical concerns **(Deng, 2015).**

4. Conclusion

The emergence of AI as a tool offering efficiency and effectiveness is seen as a significant benefit in the public policy process, addressing past issues such as slow processes, bureaucratic entanglements, and a lack of adaptability to change. Using William

Dunn's public policy cycle framework, this research finds that AI holds vast and significant potential in driving improvements in both efficiency and quality at each stage of the public policy process. Starting from the agenda-setting phase to determine important issues, policy formulation to provide alternative solutions, policy adoption to choose the best alternative, policy implementation to apply the policy, and finally the evaluation phase to assess the impact and results of the implementation, optimizing AI usage plays a crucial and important role, particularly in terms of efficiency and effectiveness.

Additionally, one feature brought by AI, such as real-time analytics, allows public policymakers to quickly and instantly determine the next strategy by considering changes in public priorities or circumstances. This capability makes AI application highly relevant and contributive in driving a dynamic, iterative, and non-linear public policy process, which aligns with the inherent characteristics of the policy cycle described by Dunn. However, it must be acknowledged that the application of AI in the public sector is a double-edged sword. In addition to offering efficiency, AI also presents significant challenges, one of the most complicated being related to ethical concerns. The absence of awareness and emotion in AI systems raises a critical question: is it ethically and morally justifiable to grant decision-making power to an entity that relies solely on instrumental rationality to govern human lives, which inherently involve complex emotions and consciousness? The complexity of finding solutions to this question remains one of the biggest challenges.

The contribution of this research to similar studies lies in its exploration of how the maximization of AI use in each stage of Dunn's public policy cycle can be achieved, as well as how ethical concerns generally become a challenge in the implementation process. This research is limited to analyzing these areas. Due to its limitations, the author recommends that future research comprehensively discuss the challenges that may arise at each stage of the public policy process, along with practical and relevant solutions that various stakeholders can implement.

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