"EVOLVING AI STRATEGIES: A COMPARATIVE ANALYSIS OF U.S. POLICIES UNDER THE OBAMA, TRUMP, AND BIDEN ADMINISTRATIONS"

DR. MUHAMMAD SHOAIB
Visiting Lecturer Political Science University of Okara
Email: mshoaibnuml@gmail.com
MUHAMMAD USMAN SHAMIM
Lecturer Department of Political Science University of Okara
Email: usaddiqui@uo.edu.pk
SARVAT IQBAL
Lecturer Political Science University of Okara
Email: sarwatiqbal231092@gmail.com
GUL FRAZ MAHMOOD
M.Phil. scholar Government College University Faisalabad
Email: raigulfaraz454@gmail.com

Abstract
This paper presents a comparative analysis of American artificial intelligence (AI) policies across three presidential administrations: Barack Obama, Donald Trump, and Joe Biden. The evolution of AI policy in the United States reflects shifting political priorities, ideological underpinnings, and responses to the global AI race, particularly in the context of U.S.-China competition. Under the Obama administration, AI policy was marked by a foundational emphasis on diversity, innovation, and a hands-off regulatory approach that entrusted the private sector with the primary role in AI development. The Trump administration, while continuing to champion American innovation, pivoted towards a more nationalistic stance, emphasizing "American values" and leadership in AI, with minimal government regulation. The Biden administration has integrated these approaches, emphasizing both ethics and diversity while strengthening America's competitive position against China through increased international cooperation and regulation. This paper examines how these administrations' varying philosophies and geopolitical strategies have shaped the trajectory of U.S. AI policy and discusses the implications for future AI governance and international collaboration.

Keywords: Artificial Intelligence (AI), U.S. AI Policy, Obama Administration, Trump Administration, Biden Administration

1. Introduction

Artificial Intelligence (AI) has become a focal point of policy discourse in the United States, reflecting its transformative potential across various sectors, including the economy, national security, and public administration. As AI technology continues to evolve, its impact on society has prompted successive U.S. administrations to formulate and adjust policies in response to shifting political priorities and global dynamics. This paper examines the evolution of U.S. AI policies under three presidential administrations—Barack Obama, Donald Trump, and Joe Biden—highlighting how each administration's approach has shaped the trajectory of AI governance in the United States.Under President Barack Obama, the foundational approach to AI policy was characterized by a focus on fostering innovation and ensuring a broad-based, inclusive framework for technological development. The Obama administration's policies emphasized the importance of diversity and collaboration between government and the private sector, advocating for a regulatory environment that encouraged innovation while allowing technological advancements to unfold organically (Executive Office of the President, 2016). This period saw the establishment of the U.S. Office of Science and Technology Policy's (OSTP) AI initiative, which laid the groundwork for a national strategy aimed at promoting AI research and addressing potential societal impacts (National Science

and Technology Council, 2016).

The transition to the Trump administration marked a shift towards a more nationalistic approach to AI policy. President Trump's tenure saw a heightened emphasis on "American values" and the assertion of U.S. leadership in the AI domain. The Trump administration's strategy prioritized economic competitiveness and national security, advocating for minimal government regulation while emphasizing the importance of American dominance in technological innovation (White House Office of Science and Technology Policy, 2018). This period was marked by a focus on reducing regulatory barriers to facilitate AI development and ensuring that the benefits of AI advancements were primarily realized within the U.S. economic and strategic contexts.

With the onset of the Biden administration, U.S. AI policy has undergone a nuanced integration of previous approaches, combining a commitment to ethical considerations with a strategic focus on maintaining competitive advantages. President Biden's administration has sought to build on the foundations laid by his predecessors while addressing contemporary challenges and opportunities in AI. The Biden administration's policy framework emphasizes a balanced approach that includes robust ethical guidelines, increased regulatory oversight, and enhanced international cooperation (Executive Office of the President, 2021). This strategy reflects a commitment to advancing AI in a manner that aligns with democratic values and promotes global collaboration to address shared challenges.

In analyzing the evolution of U.S. AI policies, it is evident that each administration has brought distinct priorities and philosophical underpinnings to the formulation of AI strategies. The Obama administration's focus on innovation and inclusivity, the Trump administration's emphasis on American leadership and minimal regulation, and the Biden administration's integration of ethics and international cooperation represent significant shifts in the policy landscape. Understanding these variations provides valuable insights into the broader trajectory of U.S. AI governance and its implications for future policy development and international engagement.

2. Research Gap:

While there is extensive literature on AI policy from various countries, there remains a notable gap in comprehensive, comparative analyses of American AI policies across different presidential administrations. Existing studies often focus on individual policy documents or strategies, but few offer a systematic comparison of how the evolving political priorities and philosophies of U.S. presidents—Obama, Trump, and Biden—have influenced AI policy development over time. Moreover, much of the existing research tends to concentrate on international comparisons, overlooking the internal policy shifts within the U.S. itself. This study seeks to fill this gap by providing a detailed comparative analysis of AI policies across these three administrations, highlighting how each administration's approach has shaped the trajectory of U.S. AI governance.

2.1. Objectives:

- Study aims to trace the development of AI policies from the Obama administration through to the Biden administration, examining how each administration's political and ideological stance has influenced their approach to AI.
- The study will systematically compare the AI policies of the Obama, Trump, and Biden administrations, identifying key similarities and differences in their strategies, priorities, and regulatory frameworks.
- By evaluating how each administration's philosophical and geopolitical perspectives have shaped AI policy, the study aims to understand the broader implications for U.S. AI governance and its role in the global AI landscape.

- The research will discuss the potential implications of these evolving policies for future AI governance, including ethical considerations, regulatory challenges, and international collaboration.

3. Literature Review
3.1. U.S. AI Policy Development and Evolution

Au, M. (2021). This article explores the expansion of restrictions on Chinese technology companies by the U.S., highlighting the continuity of some policies from the Trump administration into the Biden era. The expansion of these restrictions reflects ongoing concerns about China's technological advancements and aligns with the broader strategic framework for U.S. AI policy (Au, 2021).

Kharpal, A. (2021). Kharpal's work examines Biden's strategy to counteract China's progress in AI through a combination of continued restrictions and new initiatives to enhance domestic AI capabilities. The article provides insight into how the Biden administration's policies are designed to bolster U.S. technological leadership while addressing geopolitical challenges (Kharpal, 2021).

3.2. Biden Administration's AI Policy and Its Legislative Framework

Lander, E., & Nelson, D. (2021). This article discusses the Biden administration's announcement of an AI "bill of rights," aiming to safeguard citizens from potential negative impacts of AI technologies. The initiative reflects a commitment to ethical and inclusive AI development, bridging the Obama-era emphasis on ethics with contemporary concerns about technology's societal impacts (Lander & Nelson, 2021).

Martina, M., & Shepardson, D. (2021). The authors review the United States Innovation and Competition Act of 2021, which seeks to enhance funding for AI research and promote American innovation. This legislative effort is part of a broader strategy to maintain competitive advantages in AI and address challenges posed by international competitors like China (Martina & Shepardson, 2021).

3.3. AI.gov and Public Engagement

Mucha, M. (2021). Mucha's article covers the relaunch of AI.gov under the Biden administration, emphasizing its new focus on diversity, public engagement, and transparency. This reflects the administration's commitment to an inclusive approach to AI development and its effort to build a public-facing platform for AI initiatives and scholarship programs (Mucha, 2021).

Wayback Machine. (2021). The historical snapshot of AI.gov provides context on its evolution from its original launch under Trump to its reorientation under Biden. This resource helps track the changes in focus and objectives of the site as it adapts to the shifting priorities of different administrations (Wayback Machine, 2021).

3.4. Geopolitical Context and Legislative Responses

Senate Democrats Newsroom. (2021b). This source provides details on the "Meeting the China Challenge Act of 2021," which includes provisions to increase sanctions on China and assess Chinese AI activities. The act illustrates the legislative approach to addressing competitive dynamics with China through economic and technological measures (Senate Democrats Newsroom, 2021b).

United States Innovation and Competition Act of 2021. (2021). The act outlines key legislative

measures to enhance U.S. AI capabilities and counter China's technological advancements. It includes sections focused on increasing research funding and strengthening competitive positioning in AI, reflecting a strategic response to global challenges (United States Innovation and Competition Act, 2021).

3.5. Ethical and Human-Centered AI Approaches

U.S.-EU Trade and Technology Council Inaugural Joint Statement. (2021). This joint statement by the U.S. and EU highlights concerns about the ethical use of AI and the potential for authoritarian misuse. It underscores a commitment to human-centered approaches and democratic values, aligning with the Biden administration's focus on ethics in AI development (U.S.-EU Trade and Technology Council Inaugural Joint Statement, 2021).

4. Phased Evolution of U.S. AI Policy: From Obama's Foundational Approach to Trump's Nationalistic Shift and Biden's Comprehensive Strategy

American AI policy has undergone significant evolution since its initial development towards the end of Barack Obama's presidency in 2016. This period marks the inception of a structured AI policy framework in the United States, which has since transitioned through three distinct phases under successive administrations: Obama, Trump, and Biden. Each phase reflects varying approaches to AI governance, shaped by differing political ideologies and priorities.

Under President Obama, the policy approach was foundational, focusing on setting up a framework that emphasized innovation, inclusivity, and minimal regulatory constraints. The Obama administration's strategy aimed to foster a collaborative environment between government and private sector entities, laying the groundwork for a robust AI ecosystem.

The Trump administration, which spanned from 2017 to 2021, introduced a shift in policy direction characterized by a preference for minimal government intervention and a strong emphasis on American innovation and leadership. This period was marked by a nationalistic tone, with a focus on leveraging AI to bolster the U.S. economy and national security while emphasizing the role of free-market capitalism. The Trump administration's approach reduced regulatory barriers to encourage rapid technological advancement and maintain U.S. competitiveness.

With the inauguration of President Biden in January 2021, a new phase of AI policy emerged, integrating elements from both previous administrations while introducing a more comprehensive and balanced strategy. The Biden administration's approach underscores a commitment to ethical considerations and diversity in AI development, alongside strengthening the U.S.'s competitive stance through increased international cooperation and regulatory oversight. This phase reflects a nuanced policy that seeks to address both the opportunities and challenges associated with AI, promoting a vision of innovation that aligns with democratic values and global standards.

Throughout these phases, several consistent themes have persisted, including the minimization of government intervention and an emphasis on the role of free-market capitalism. However, there are notable variations in the degree to which diversity in AI development is prioritized and the definitions of who benefits from AI advancements. This evolving landscape highlights the dynamic nature of U.S. AI policy and its alignment with broader political and economic objectives.

4.1. Foundational Framework of AI Policy under the Obama Administration: Emphasis on Diversity and Innovation

The Obama administration's initiation of American AI policy in 2016 laid a foundational framework that emphasized diversity, innovation, and a market-driven approach. This early phase of AI policy was characterized by a relatively laissez-faire attitude, aiming to foster a conducive environment for technological advancement while prioritizing diversity and American leadership in the field.

In October 2016, the National Science and Technology Council (NSTC) released two key documents: "Preparing for the Future of Artificial Intelligence" and "The National Artificial Intelligence Research and Development Strategic Plan" (R&D Plan). The former provided a comprehensive assessment of AI's current state, its societal impacts, and public policy considerations, while offering recommendations for governmental action (NSTC, 2016). The latter served as a high-level framework outlining seven strategic priorities for AI research and development, designed to guide federal agencies without delving into specific research agendas (NSTC, 2016).

Additionally, in December 2016, the report "Artificial Intelligence, Automation, and the Economy" was published, which explored the implications of AI-driven automation on the American labor market and economic landscape, and offered policy recommendations to address these challenges (Executive Office of the President, 2016). Despite the progressive nature of these documents, criticisms have emerged regarding their heavy reliance on private-sector self- regulation and perceived shortcomings in addressing ethical concerns comprehensively (Cath et al., 2018).

The documents collectively emphasized the importance of cultivating a diverse AI workforce and promoting collaboration with international partners, positioning the U.S. as a global leader in AI development. The vision advocated for AI to be developed by and for diverse populations, extending beyond national borders (Executive Office of the President, 2016). Furthermore, the "Artificial Intelligence, Automation, and the Economy" report highlighted the need to balance the benefits and risks of automation for American workers, reflecting a concern for the socio- economic impacts of AI (Executive Office of the President, 2016).

However, the Obama administration's tenure, ending shortly after these documents' release, provided limited time for extensive policy implementation. The foundational themes established during this period, notably the reliance on free-market principles and the emphasis on American innovation, carried forward into subsequent administrations. The R&D Plan's approach to AI development underscored a role for the private sector in driving innovation, while the government was expected to address areas less attractive to industry due to insufficient profit incentives (Cath et al., 2018). This approach set the stage for a policy environment characterized by a broad regulatory framework within which private entities could innovate, reflecting a hands-off yet strategic approach to AI governance.

4.2. Trump Administration: An Emphasis on American Innovation and Minimal Regulation

During the first half of Donald Trump's presidency, U.S. AI policy was characterized by a notably laissez-faire approach. Initially, the administration adopted a hands-off stance, advocating minimal government intervention and underscoring the importance of preserving American innovation and market dynamics (Knight, 2018). This period was marked by an absence of emphasis on diversity and ethical considerations, contrasting sharply with the more inclusive and ethical framework of the preceding Obama administration.

For the first two years, Trump's approach was largely reactive, reflecting a belief that excessive regulation could stifle technological progress. This philosophy was encapsulated in the Department of Defense's (DoD) 2018 "Artificial Intelligence Strategy," which prioritized maintaining U.S. leadership in AI and reducing regulatory burdens to facilitate innovation (The White House Office of

Science and Technology Policy, 2018). The administration's rhetoric celebrated American values and innovation, but its policy actions largely refrained from addressing the ethical dimensions of AI development.

However, this stance evolved following a May 2018 summit on "AI for American Industry," where the emphasis shifted to a more structured approach to AI policy. The summit's summary underscored the need for reducing "overly burdensome" regulations and fostering public-private partnerships to advance U.S. leadership in AI (The White House Office of Science and Technology Policy, 2018). In response to these discussions, Defense Secretary Jim Mattis advocated for a national AI strategy, highlighting concerns that the U.S. was falling behind international competitors (Metz, 2018). This led to the signing of Executive Order 13859 in February 2019, which formalized the "American AI Initiative" (Executive Order No. 13859, 2019).

The "American AI Initiative" aimed to bolster U.S. technological leadership by focusing on standards development, workforce training, and international collaboration, while explicitly incorporating the notion of AI aligned with "American values" (Executive Order No. 13859, 2019). Although this executive order included elements of trustworthiness and privacy, these were framed within the context of safeguarding U.S. economic and national security interests (Future of Life Institute, 2021). The rhetoric around "American values" seemed to prioritize market-driven innovation over a substantive commitment to ethical and inclusive AI development.

The evolution of policy under Trump introduced a competing narrative between fostering innovation and addressing ethical concerns. Despite the administration's focus on minimizing regulation, it also sought to align AI development with values perceived as quintessentially American. However, the emphasis on "trustworthy AI" as outlined in later documents like Executive Order 13960 (Executive Order No. 13960, 2020) often reflected a pragmatic approach to encouraging widespread adoption rather than a commitment to the ethical frameworks promoted

by international bodies such as the OECD and the EU High-Level Expert Group (Alexander, 2019; HLEG, 2019).

While the Trump administration's AI policy aimed to enhance American technological dominance and minimize regulatory constraints, it largely deferred ethical considerations and diversity issues to secondary importance. This approach created a tension between fostering innovation and ensuring that AI development aligns with broader societal values, a gap that was somewhat addressed in subsequent policy shifts under the Biden administration.

4.3. Navigating Value-Based AI Policy Under the Biden Administration: A Synthesis of Innovation, Regulation, and Ethical Considerations

Since President Joe Biden assumed office in January 2021, his administration has significantly redefined the U.S. approach to artificial intelligence (AI), framing it as a values-driven contest, particularly with respect to China. This shift marks a nuanced departure from previous strategies, reflecting a blend of past administration principles with new regulatory and ethical dimensions. The Biden administration's approach is characterized by a dual focus on maintaining American leadership in AI while addressing ethical concerns and promoting inclusivity.

One of the key developments in Biden's AI policy is the release of the National Security Commission on Artificial Intelligence (NSCAI) "Final Report" in March 2021. This report positions AI competition as a contest of values, explicitly identifying China as a primary competitor in this domain (NSCAI, 2021). The report reflects a strategic pivot from the Trump administration's more implicit stance on AI competition, emphasizing the need to align AI advancements with American

values of ethics, safety, and innovation (NSCAI, 2021). Concurrently, the relaunch of AI.gov under Biden's administration highlights a commitment to transparency and public engagement, showcasing initiatives designed to advance AI research, foster diversity, and address ethical issues (Mucha, 2021).

In legislative efforts, the bipartisan "United States Innovation and Competition Act of 2021" further underscores the competitive aspect of AI policy, emphasizing support for American innovation while addressing challenges posed by China (Senate Democrats Newsroom, 2021b). This act not only builds on previous executive orders but also introduces measures to increase

funding for AI research and development, signaling a comprehensive approach to enhancing the U.S.'s technological edge (Martina & Shepardson, 2021). Notably, it includes the "Meeting the China Challenge Act of 2021," which outlines provisions for expanding sanctions on Chinese technology and scrutinizing Chinese AI activities (United States Innovation and Competition Act, 2021).

In addition to these external measures, the Biden administration has retained and expanded upon several Trump-era policies, such as export bans on Chinese technology companies, while introducing new initiatives to strengthen domestic AI capabilities and foster international collaboration (Au, 2021; Kharpal, 2021). Biden's administration is not only continuing efforts to limit Chinese technological advancements but also investing in domestic AI infrastructure and enhancing cooperation with allies, such as Japan and South Korea, to counteract China's influence (Fitzsimmons, 2021).

Furthermore, the Biden administration has revived and expanded the ethical and inclusivity frameworks from the Obama era, aiming to define and implement a vision of a "Good AI Society" that respects human rights and democratic values (Lander & Nelson, 2021). The call for an AI "bill of rights" and the emphasis on a human-centered approach reflect a renewed commitment to ensuring that AI technologies are developed and deployed in a manner consistent with core democratic principles and human rights (U.S.-EU Trade and Technology Council Inaugural Joint Statement, 2021).

The Biden administration's AI policy represents a synthesis of innovation and regulation, integrating ethical considerations with strategic measures to maintain U.S. leadership in AI. This approach reflects a more coherent and inclusive vision, bridging past and current policy themes while explicitly framing the competition with China in terms of values and technological advancement.

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