Shaping the Future: AI Governance and its Dynamic Effect on India's AI Competitiveness

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Abstract

India's potential in Artificial Intelligence (AI) is significant, with a large skilled workforce and a growing AI industry. However, the lack of a comprehensive regulatory framework raises concerns about ethical AI development, data privacy, and potential misuse, impacting public trust and India's global competitiveness. This thesis employed a mixed-methods approach, combining a literature review of existing AI governance models with insights from semi-structured interviews with Indian AI experts and a public perception survey. The findings highlighted a strong desire for a robust, centralized regulatory framework that balances innovation with ethical considerations and data protection. Experts emphasized the need for increased investment in foundational AI research, collaborative policymaking involving government, industry, and academia, and a focus on mitigating potential biases and risks associated with AI deployment. This research challenges the assumption that stringent AI governance would hinder India's AI competitiveness, suggesting that a well-defined regulatory framework, tailored to India's unique socio-economic context, can foster public trust, attract investment, and position India as a leader in responsible AI development. The thesis concludes by offering recommendations for policymakers, industry leaders, and researchers to collaboratively shape a future where AI technologies contribute positively to India's growth and societal well-being.

Keywords: Artificial Intelligence (AI), AI Governance, India, AI Competitiveness, Responsible AI, AI Regulation, Centralized vs Decentralized Governance, AI Ethics, AI Policy, Ambidextrous Governance

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Sumário

A Índia tem um potencial significativo no domínio da Inteligência Artificial (IA), mas carece de um quadro regulamentar abrangente, o que suscita preocupações quanto ao desenvolvimento ético, à privacidade dos dados e a uma potencial utilização indevida. Esta dissertação utilizou uma abordagem de métodos mistos, combinando uma revisão da literatura com conhecimentos de entrevistas com especialistas indianos em IA e um inquérito à perceção pública. Os resultados destacaram a necessidade de um quadro regulamentar robusto e centralizado que equilibre a inovação com considerações éticas e proteção de dados. Os especialistas enfatizaram um maior investimento na investigação fundamental da IA, na elaboração de políticas colaborativas e na mitigação de potenciais preconceitos e riscos. Esta investigação sugere que um quadro regulamentar bem definido, adaptado ao contexto socioeconómico da Índia, pode promover a confiança do público, atrair investimento e posicionar a Índia como líder no desenvolvimento responsável da IA. A dissertação oferece recomendações aos decisores políticos, líderes da indústria e investigadores para moldar um futuro em que as tecnologias de IA contribuam positivamente para o crescimento e o bem-estar social da Índia.

Palavras-chave: Inteligência Artificial (IA), Governação da IA, Índia, Competitividade da IA, IA Responsável, Regulação da IA, Governação Centralizada vs Descentralizada, Ética da IA, Política da IA, Governação Ambidestra

Título: Moldando o Futuro: A governação da IA e o seu efeito dinâmico na competitividade da IA na Índia

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Disclaimer

While artificial intelligence (AI) tools were utilized in the preparation of this thesis for language correction and refinement purposes, it is important to note that AI was not employed to generate original ideas, content, or text. All research findings, analyses, and conclusions presented in this thesis are the product of the author's intellectual efforts.

Additionally, some interviewees did not wish to remain anonymous in this study. Hence their names and company will be mentioned in the interview summaries present in the appendices.

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Introduction

Artificial Intelligence (AI) is advancing rapidly, transforming industries, societies, and human interaction. While AI offers immense potential, its rapid evolution raises critical questions about ethics, accountability, and potential misuse.

Investment in AI research and development is skyrocketing, with global spending expected to reach trillions of dollars. AI is reshaping our world, and the digital environments future generations will inhabit. This profound transformation demands clear sociopolitical frameworks and a 'regulative ideal' to ensure AI aligns with our values.

Globally, there is growing recognition of the importance of international cooperation in shaping AI governance norms and standards. Initiatives like the Global Partnership on AI (GPAI) and OECD AI Principles aim to foster dialogue and promote responsible AI development across borders. However, the AI governance landscape remains fragmented.

India's evolving AI landscape presents a valuable opportunity to explore effective governance models through a case study approach. India's workforce holds the highest average share of AI skills represented among its top 50 skills than any other country in the world—roughly 2.6 times the global average (Stanly, 2023). This indicates the availability of a large pool of skilled professionals. The Indian AI market size reached $680 million in 2022 and is expected to reach $3.935 billion by 2028, with a CAGR (Compound Annual Growth Rate) of 33.28% (Stanly, 2023). This signifies a booming AI industry in India. However, the Indian government has not implemented any regulations on data or AI. This makes a country like India severely susceptible to misuse and misinformation. The 2024 World Economic Forum report ranked India as the country with the highest risk of misinformation and disinformation (Cavaciuti-Wishart, Heading , Kohler, & Zahidi, 2024).

This thesis aims to illuminate how AI governance can either fuel or impede innovation, shape public trust, and ultimately influence the overall trajectory of AI development in India. It examines the following Research Question:

How will AI governance affect India's AI competitiveness?

Literature Review

This literature review examines the evolving landscape of AI governance, exploring the challenges and complexities of responsibly guiding this transformative force. It explores the existing policies and governance practices drafted and implemented by the key international players in the AI landscape.

Introduction to Artificial Intelligence (AI)

Brief history of AI

It is difficult to define artificial intelligence without first discussing its origins and evolution. We can trace the first genesis of AI to 1950 with Alan Turing proposing the Turing test, a benchmark to assess a machine's ability to exhibit intelligent behavior equivalent to a human. The Turing Test involves three participants: a human interrogator, a human, and a machine. The interrogator asks questions without knowing who is who, and must determine which participant is the human. No machine has yet successfully passed the Turing Test (Turing, 2007), (Gonçalves, 2021). In 1956, The Dartmouth Summer Research Project on Artificial Intelligence takes place, marking the coining of the term "Artificial Intelligence". This event is recognized as a foundational moment for AI research. In 1959, Massachusetts Institute of Technology (MIT) established the first laboratory dedicated to AI research. This signifies the growing interest and investment in the field of AI. It is in this very laboratory where ELIZA, the first chatbot, was created by Joseph Weizenbaum in 1966. (Weizenbaum, 1996). At the same time, Arthur Samuel's groundbreaking paper on Machine Learning ushered in a new era within the field of Artificial Intelligence (AI). His work introduced the revolutionary concept of machines learning from data without requiring explicit programming. This continues to mark a pivotal moment, signifying the ongoing emergence of machine learning as a critical subfield of AI. (Samuel, 1959)

The CALO project (2003), funded by DARPA, was a pivotal moment in chatbot development, aiming to create AI assistants that could learn, reason, and adapt to complex tasks. While not directly a consumer-facing chatbot, CALO's research into cognitive assistants influenced later technologies like Apple's Siri (2011). This drive for advanced dialogue systems fueled the creation of chatbots like Mitsuku (2005), known for their engaging personality, and IBM's

Watson (2006), which showcased remarkable question-answering capabilities. Meanwhile, Microsoft's XiaoIce (2014) focused on emotional connection, highlighting the potential for AI companions. The advent of deep learning and large language models (LLMs), particularly those utilizing the Transformer architecture, revolutionized chatbots. OpenAI's ChatGPT (2018-present), built on powerful LLMs, demonstrates exceptional abilities in understanding context and generating nuanced, human-like text. Google followed suit with Bard (2023), powered by their LaMDA language model, showcasing their own advancements in building a highly capable conversational AI driven by language understanding and information retrieval. (Shazed Ali, et al., 2024)

The rapidly evolving landscape of Generative AI has witnessed remarkable advancements in recent times, with tech giants and innovative startups pushing the boundaries of what's possible. OpenAI's highly anticipated GPT-4 model has taken the world by storm, exhibiting extraordinary language understanding and generation capabilities that surpass its predecessors (OpenAI, 2023). The model's ability to engage in coherent conversations, answer complex questions, and even write creative fiction has opened new avenues for AI-assisted content creation and interactive experiences.

Meanwhile, Google has unveiled its own groundbreaking AI model called PaLM-2, which boasts an impressive 340 billion parameters and showcases exceptional performance across a wide range of tasks, including natural language processing, reasoning, and code generation (Google AI, 2023). This development has intensified the competition among tech giants, driving innovation and setting new benchmarks in the field of Generative AI.

Defining Artificial Intelligence (AI) & Machine Learning (ML)

Artificial Intelligence: is the science and engineering of inventing machines or computer systems with features imitating humanlike abilities or behaviors such as visual and speech interpretation, problem-solving, and self-teaching. (Klontzas & Fanni, 2023)

Different types of AI can be segregated according to either their capabilities or functionalities. (IBM Data and AI Team, 2023)

AI based on capabilities:

1. **Artificial Narrow AI (ANI, Weak AI) –** This is the only type of AI that exists today. ANI excels at performing specific tasks with high accuracy and speed, often exceeding human capabilities in those areas. Narrow AI can be trained to excel at a specific task, often surpassing human speed and accuracy. However, it's confined to that single task and cannot adapt to new or unrelated problems. Many of the AI systems we interact with daily are ANI. This includes virtual assistants like Siri and Alexa, recommendation algorithms on Netflix, and spam filters in email. Even some medical diagnosis systems fall under ANI when they specialize in analyzing a particular type of scan or data. (A Survey of Artificial Intelligence Challenges: Analyzing the Definitions, Relationships, and Evolutions, 2022)

2. **Artificial General Intelligence (AGI, Strong AI) –** A theoretical concept at present. AGI can independently build upon its past experiences to master new skills in different areas. This ability makes it a self-directed learner, capable of performing any intellectual task within the scope of human abilities. (A Survey of Artificial Intelligence Challenges: Analyzing the Definitions, Relationships, and Evolutions, 2022)

3. **Super AI (Artificial Superintelligence) –** Similar to AGI, this is currently a theoretical concept. If Super AI ever becomes reality, it will surpass human intellect in areas of thinking, reasoning, learning, and judgment. Applications built on Super AI would transcend understanding human emotions, instead developing their own unique feelings, needs, beliefs, and desires. (IBM Data and AI Team, 2023)

AI based on functionalities:

1. **Reactive Machine AI** - Reactive machines are AI systems specifically designed for a single task. They can't recall past data or decisions, so they operate solely on the information available at the moment. Despite this limitation, they are capable of rapidly processing large amounts of data through statistical techniques to generate insights. *(Artificial Intelligence (AI) or Intelligence, 2020)*

2. **Limited Memory AI -** Limited Memory AI can use past information to make better decisions in the present. It analyzes past events, situations, and objects to inform its current actions. However, it cannot store these experiences for long-term use. As Limited Memory AI learns from more data, its performance and accuracy improve. (Artificial Intelligence (AI) or Intelligence, 2020)

   Examples of Limited Memory AI in Action

- **Generative AI:** Tools like ChatGPT, Bard, and DeepAI use Limited Memory AI to predict the most likely words, phrases, or visuals to continue a piece of content.

- **Virtual Assistants and Chatbots:** Siri, Alexa, and others combine natural language processing with Limited Memory AI. This allows them to understand questions, act, and generate relevant responses.

- **Self-driving Cars:** Autonomous vehicles leverage Limited Memory AI to make real-time decisions. They analyse their surroundings, past traffic patterns, and other data to navigate roads safely.

3. **Theory of Mind AI –** This is a hypothetical form of Artificial General Intelligence that aims to understand the thoughts, emotions, and motivations of others. This would enable it to personalize interactions and build relationships similar to how humans do. In theory, such an AI could even grasp deeper meanings behind artwork and writing, a skill lacking in current generative AI models. (Artificial Intelligence (AI) or Intelligence, 2020)

Emotion AI: A Step Towards Theory of Mind - Emotion AI is a subset of Theory of Mind AI currently under development. It focuses on analyzing voices, images, and other data to detect and respond appropriately to human emotions. While still in its early stages, Emotion AI aims to bridge the gap by allowing machines to better comprehend our emotional states. (Meredith, 2019)

4. **Self-Aware AI** - Self-Aware AI is a theoretical form of AI, potentially related to the concepts of Superintelligence. It would possess not only an understanding of human emotions and thoughts but also a consciousness of its own internal state, emotions, and beliefs. (IBM Data and AI Team, 2023)

***Machine Learning*:** ML is a subfield of AI in which computer systems can understand and learn patterns in order to solve problems without external reprogramming. (Klontzas & Fanni, 2023)

Artificial intelligence (AI) is the ambitious pursuit of creating intelligent machines that can mimic human cognitive abilities. This broad field encompasses various approaches, including machine learning (ML). ML acts as the workhorse, training algorithms to learn from data. Unlike traditional programming with explicit instructions, ML algorithms are data driven. They discover patterns and relationships within massive datasets, allowing them to improve performance on specific tasks. This focus on specific tasks makes them highly adaptable, continuously learning and refining their abilities as they process more data. However, ML's effectiveness hinges on the quality and relevance of the data it's trained on. While structured and semi-structured data are commonly used, advancements in deep learning, a subfield of ML, are pushing the boundaries. Machines are now capable of learning from unstructured formats like text, images, and audio, opening doors to exciting possibilities in areas like natural language processing and computer vision. (Piloto)

Risks with AI

Generative AI, or GAI for short, is rapidly transforming how we interact with technology. This cutting-edge field of artificial intelligence allows machines to create entirely new content, from realistic images and captivating music to informative text and innovative

product designs. Its applications are vast and hold immense potential to benefit everyone in our daily lives. Yet, this technology is not without risk. (McKinsey & Company, 2024), (Google, 2024).

The paper titled "The dark side of generative artificial intelligence: A critical analysis of controversies and risks of ChatGPT" by (Wach, et al., 2023), examines the potential negative aspects of generative artificial intelligence (GAI), specifically focusing on ChatGPT, a large language model chatbot developed by OpenAI.

The authors identify seven key risks associated with GAI and ChatGPT. These include:

1. **No regulation of the AI market and urgent need for regulation**
   The breakneck speed of AI innovation, especially in generative AI, currently outpaces the development of comprehensive regulations. This lack of a guiding framework poses multi-faceted risks. It leaves AI vulnerable to generating damaging content, jeopardizing societal wellbeing, and widening economic gaps. Without urgent intervention, the unchecked power of AI could become a destabilizing force.

2. **Poor quality, lack of quality control, disinformation, deepfake content, and algorithmic bias**
   AI models, if devoid of rigorous quality control, are prone to generating flawed, inaccurate, or even malicious content. This jeopardizes the integrity of information. Disinformation can flourish, and hyper-realistic deepfakes can erode trust. Additionally, AI systems often learn from vast datasets that may contain biases. These biases can then be amplified, resulting in unfair or discriminatory outcomes that clash with societal values.

3. **Automation-spurred job losses**
   AI's remarkable ability to automate tasks carries a double-edged sword. While streamlining operations offers potential economic gains, it simultaneously sparks widespread concerns about job displacement. Many sectors of the workforce could face significant disruption. Failure to proactively address these challenges could lead

to economic instability and social unrest, especially for those without the means to adapt.

4. **Personal data violation, social surveillance, and privacy violation**
   AI's hunger for data heightens risks to individual privacy. Large-scale data collection practices make personal information vulnerable to exploitation. This enables the potential for intrusive surveillance and the targeted manipulation of individuals. Erosion of privacy undermines not only personal autonomy but can also stifle dissent and damage trust in institutions.

5. **Social manipulation, weakening ethics and goodwill.**
   The ability of AI to craft compelling, seemingly authentic content raises alarms about widespread social manipulation. Bad actors could utilize AI tools to launch disinformation campaigns designed to sow discord and sway public opinion. A breakdown in trust and the deterioration of social cohesion could lead to instability and undermine democratic processes.

6. **Widening socio-economic inequalities**
   Unequal access to and mastery of AI technologies risks exacerbating existing socioeconomic divides. Those with resources and expertise stand to gain considerably, while those left behind may face further marginalization. This digital divide could solidify a two-tiered society where opportunity is increasingly concentrated among an elite few.

7. **AI technostress**
   Increasing reliance on AI in both personal and work lives could lead to heightened levels of AI technostress. Individuals may grapple with a sense of being overwhelmed by rapidly evolving technologies. The lines between human ability and machine capability could blur, triggering feelings of anxiety and loss of control.

Hence, the seven key risks identified by Wach et al. (2023) provide a starting point for a critical conversation about the responsible development and deployment of generative AI.

Responsible AI

A prominent framework for ethical and responsible AI envisions a "Good AI Society" (Floridi, et al., 2018) where AI technologies contribute positively to human flourishing. This framework considers key opportunities presented by AI, such as empowering individuals, enhancing decision-making, augmenting societal problem-solving, and fostering collaboration. However, it also recognizes corresponding risks like the diminishing of human skills, weakening of accountability, reduced human oversight, and threats to self-determination. To navigate these ethical complexities, the framework emphasizes five fundamental principles:

1. **Beneficence:** AI systems should be designed with the primary goal of promoting human well-being and societal good. This involves actively seeking positive outcomes rather than merely avoiding harm.

2. **Non-maleficence:** AI should be proactively designed to avoid causing harm. This includes anticipating both direct and indirect negative consequences and implementing safeguards against them.

3. **Autonomy:** AI systems must uphold and prioritize human autonomy. This means ensuring humans retain ultimate agency in decision-making, particularly in areas where individual choice and self-determination are essential.

4. **Justice:** AI must be built and deployed in a manner that addresses issues of fairness, inclusivity, and the avoidance of discrimination or bias. This involves careful consideration of potential impacts on different groups within society.

5. **Explicability:** It's essential that AI systems remain understandable and accountable. This means providing transparency into their decision-making processes, allowing for human oversight and intervention when necessary.

These principles are seen as crucial guideposts for the responsible development and use of AI. They aim to ensure that while maximizing AI's potential benefits, we safeguard society

against its inherent risks and work towards a future where AI serves to improve the lives of all.

NITI Aayog, the Indian government's policy think tank, has developed a set of principles for responsible and ethical AI implementation. These principles draw inspiration from the fundamental rights enshrined within the Indian Constitution, such as equality, privacy, the right to life and healthcare, non-discrimination, and economic welfare. This approach highlights the crucial connection between responsible AI practices and India's strong constitutional framework. NITI Aayog further advocates for amending existing Indian laws to incorporate explicit AI and data protection regulations. This step would create a comprehensive regulatory framework ensuring the development and use of AI aligns with established constitutional values and prioritizes the protection of citizen rights in the digital age. (Approach Document for India Part 1 – Principles for Responsible AI, 2021) (Approach Document for India: Part 2 - Operationalizing Principles for Responsible AI, 2021)

To guide this process, NITI Aayog has proposed the following core principles:

1. **Principle of Safety and Reliability:** AI systems should work as designed and have safeguards in place to protect users and stakeholders.

2. **Principle of Equality**: AI must treat everyone equally under the same circumstances, without favoritism or bias.

3. **Principle of Inclusivity and Non-discrimination**: AI shouldn't exclude anyone based on identity factors (e.g., race, religion, gender). It should work to prevent unfair denial of opportunities or benefits.

4. **Principle of Privacy and Security:** AI must protect the privacy and security of any personal data used, with access restricted to only those authorized.

5. **Principle of Transparency:** How the AI system works should be understandable and open to outside examination to ensure fairness and accountability.

6. **Principle of Accountability:** Everyone involved in creating and using the AI system should be held responsible for their actions and decisions.

7. **Principle of protection and reinforcement of positive human values:** AI should uphold positive values like social harmony and avoid disrupting community relationships.

However, the principles themselves remain broad, potentially leading to inconsistent or even contradictory implementations. The report's lack of specific guidance on how to translate these principles into practice leaves both the government and private sector with significant leeway. This raises concerns about whether the suggested principles can be effectively enforced, and whether their intended goal of safeguarding citizen rights within the evolving AI landscape can be consistently achieved.

Need for dynamic public policy with AI

The integration of artificial intelligence (AI) into public policy necessitates a critical reevaluation of traditional policy cycle frameworks. The conventional policy cycle, often depicted as a linear progression through stages of agenda setting, policy formulation, decision-making, implementation, and evaluation, may struggle to accommodate the dynamic and iterative nature of AI-driven governance. (David Valle-Cruz, 2020)

In the traditional model, agenda setting involves identifying and prioritizing public problems. Policy formulation then focuses on developing potential solutions and crafting legislative proposals. Decision-making signifies the selection of a specific policy course. Implementation entails putting the chosen policy into action, and evaluation assesses the policy's effectiveness and potential need for adjustments.

However, the dynamic nature of AI necessitates a more iterative and responsive policy cycle. AI systems can continuously analyze real-time data and generate insights that may necessitate revisiting earlier stages of the policy cycle. For example, AI-powered social media analysis might reveal emerging public concerns that require adjustments to the agenda. Predictive

modeling could inform policy formulation by highlighting potential unintended consequences of proposed solutions.

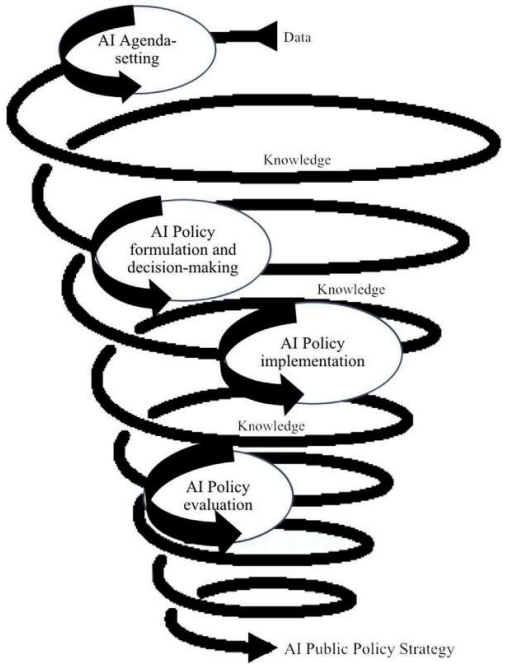

Figure 1

This dynamic public policy cycle emphasizes continuous feedback loops and learning. Policymakers can leverage AI analytics to refine policy interventions throughout the implementation stage, ensuring their effectiveness in addressing evolving public needs. Evaluation becomes an ongoing process, with AI constantly monitoring and analyzing policy outcomes to inform adjustments and potential reformulations.

The dynamic public policy cycle, shaped by AI, highlights the importance of citizen engagement and collaborative governance. Public trust and acceptance are crucial for the successful integration of AI in policymaking. Mechanisms for soliciting citizen input, fostering algorithmic transparency, and ensuring accountability are essential. This collaborative approach recognizes AI not just as a technical tool but as a force that must be embedded within a broader social and ethical context.

In conclusion, reimagining the policy cycle in the age of AI presents significant challenges, but also immense opportunities. As policymakers, technologists, and citizens navigate this evolving landscape, fostering open dialogue, ensuring ethical considerations, and harnessing the power of AI for the public good will be paramount.

Country Comparisons

1. AI Regulation in the EU

The European Union has taken a proactive and comprehensive approach to AI regulation with its AI Act (European Commission, 2021). The Act adopts a risk-based framework that classifies AI systems into four categories: unacceptable risk, high risk, limited risk, and minimal risk. It outright bans AI systems considered unacceptable, such as those that manipulate human behavior or conduct social scoring. High-risk AI systems, including those used in critical infrastructure, education, employment, and law enforcement, are subject to strict requirements before entering the market. Providers must conduct conformity assessments, maintain detailed documentation, ensure human oversight, adhere to high standards of data quality and security, and implement measures to ensure transparency and interpretability (Smuha, et al., 2021).

The Act also emphasizes the importance of transparency, requiring providers to supply clear information about the purpose, data, and risks of high-risk systems (Veale & Borgesius, 2021). This approach aims to protect fundamental rights, build public trust, and ensure that humans can understand and challenge AI-driven decisions. However, some critics argue that the Act's compliance burdens and centralized regulatory structure could hinder innovation and disadvantage European AI companies compared to those in the US or China (Hine & Floridi, 2022).

The EU's approach to AI governance is grounded in its values and commitment to human rights, reflecting a "European way" of balancing innovation with individual protections. It builds on previous EU initiatives like the General Data Protection Regulation (GDPR) and seeks to establish the EU as a global leader in ethical, trustworthy (Smuha, From a ‘race to AI’ to a ‘race to AI regulation’: regulatory competition for artificial intelligence, 2021). As

the first comprehensive attempt to regulate AI, the EU AI Act will have profound implications for the development and deployment of the technology both within Europe and around the world.

2. AI Regulation in the US

The United States has taken a more decentralized and industry-friendly approach to AI governance compared to the European Union. During the Obama and Trump administrations, federal AI policy focused primarily on maintaining American leadership through R&D investment, public-private partnerships, and the development of high-level principles (Hine & Floridi, 2022). The Trump administration pursued a hands-off regulatory stance, arguing that excessive regulation would stifle innovation and hinder American competitiveness (Executive Order No. 13859, 2019).

However, there are signs that the US approach to AI governance may be evolving. The Biden administration is now considering a binding AI Bill of Rights to protect citizens from harmful or discriminatory AI applications (Lander & Nelson, 2021). The Bill aims to give citizens the right to be protected from unsafe or ineffective systems, algorithmic discrimination, abusive data practices, and from being subjected to AI systems without consent. It also emphasizes the importance of transparency, human oversight, and accountability.

Additionally, Congress has proposed the Algorithmic Accountability Act, which would require companies to conduct impact assessments for automated decision systems that pose high risks to individuals (Mökander, Juneja, Watson, & Floridi, 2022). This reflects growing concerns about the potential for AI to perpetuate or exacerbate social biases and disparities.

Despite these developments, the US approach to AI governance remains more fragmented and less comprehensive than the EU's. While the US has participated in developing international AI principles, such as the OECD AI Principles, it has not yet enacted comprehensive federal legislation (Roberts, et al., 2021). Instead, AI governance in the US is shaped by a patchwork of state and local laws, sector-specific regulations, and voluntary industry guidelines.

This decentralized approach has some advantages, such as allowing for experimentation and adaptation to local needs. However, it also creates challenges for ensuring consistent standards and protections across jurisdictions.

3. AI Regulation in the UK

The United Kingdom has charted its path on AI governance, diverging from the more centralized and strict approach taken by the European Union. In 2022, the UK government released a policy paper titled "Establishing a pro-innovation approach to regulating AI," which sets out its vision for a light-touch, sectoral approach to AI regulation (United Kingdom Secretary of State for Digital, Culture, Media and Sport, 2022).

The UK's approach is grounded in the belief that overregulation could stifle innovation and hinder the development of AI technologies that could bring significant economic and social benefits. Instead of creating a new central AI regulator, the UK plans to rely on existing regulators, such as the Information Commissioner's Office, the Competition and Markets Authority, and the Medicine and Healthcare Products Regulatory Agency, to oversee the use of AI within their respective sectors.

The policy paper outlines a set of high-level principles that should guide the development and use of AI in the UK, drawing on the OECD AI Principles. These principles include ensuring that AI is used safely and securely, that it is transparent and explainable, and that it is fair and non-discriminatory. However, the paper does not provide detailed guidance on how these principles should be implemented in practice, instead leaving it up to individual regulators to interpret and apply them in their specific contexts.

Critics of the UK's approach argue that it relies too heavily on self-regulation by industry and may not provide sufficient protection for individuals and communities affected by AI systems. There are concerns that without clear, binding rules and enforcement mechanisms, companies may prioritize profits over ethical considerations, leading to the development of AI systems that perpetuate biases, violate privacy, or cause other harms.

Proponents of the UK's approach, on the other hand, argue that it provides a more flexible and adaptable framework for regulating a rapidly evolving technology. By allowing regulators to tailor their approach to the specific needs and risks of their sectors, the UK hopes to create a more dynamic and innovation-friendly environment for AI development.

The UK's AI governance strategy also emphasizes the importance of international collaboration and standards-setting. The policy paper calls for the UK to work with like-minded countries to develop global norms and best practices for AI governance, while also promoting the UK as a hub for responsible AI innovation.

As the UK navigates its post-Brexit relationship with the European Union and seeks to position itself as a global leader in AI, its approach to AI governance will be closely watched. While the light-touch, sectoral approach may appeal to some in the tech industry, there are also risks that it could lead to a fragmented and inconsistent regulatory landscape, both within the UK and in relation to other countries.

4. AI Regulation in China

China has made no secret of its ambition to become the global leader in artificial intelligence by 2030. The Chinese government views AI as a strategic technology that is crucial for economic growth, social stability, and national security. To achieve this goal, China has devoted vast state resources and leveraged its centralized, authoritarian system to drive rapid progress in AI development and deployment (Roberts, et al., 2019).

China's approach to AI governance is characterized by strong central planning and coordination, with the state setting ambitious targets and providing support for key industries and research institutions. The New Generation Artificial Intelligence Development Plan, released in 2017, outlines a three-step strategy for China to become the world leader in AI theory, technology, and applications by 2030 (Hine & Floridi, 2022). The plan includes initiatives to strengthen basic research, develop key technologies, cultivate talent, and promote the integration of AI into various sectors of the economy.

To implement this strategy, the Chinese government has enlisted the help of the country's tech giants, such as Alibaba, Baidu, and Tencent, which have been designated as "national champions" and given privileged access to data, funding, and policy support (Roberts, et al., 2021). Local governments and businesses are also encouraged to develop their own AI strategies and pilot projects in line with national goals.

In recent years, China has introduced several regulations aimed at promoting the responsible development and use of AI. For example, the Internet Information Service Algorithmic Recommendation Management Provisions, issued in 2022, prohibit the use of algorithms to engage in illegal activities, spread disinformation, or manipulate user opinions. The regulations also require companies to report self-assessments, inform users about how algorithms work, and provide options to decline personalized recommendations (Toner, Creemers, & Webster, 2021).

However, China's AI governance approach has also raised concerns about privacy, surveillance, and human rights. The Chinese government has been criticized for using AI and other technologies to monitor and control its citizens, particularly ethnic minorities such as the Uyghurs in Xinjiang (Roberts, et al., 2021). There are also questions about the transparency and accountability of China's AI development process, as well as the potential for AI to be used for military purposes. Evidence has been found of the use of AI, particularly facial recognition by the Chinese Communist Party to suppress politically motivated unrest in certain areas. Local police reportedly increased procurement of AI technology in response to episodes of unrest. (David & Yuchtman, 2022)

Despite these concerns, China's centralized, top-down approach to AI governance has enabled it to make rapid progress in the field. By prioritizing innovation and economic growth over individual rights and democratic values, China has positioned itself as a formidable competitor to the US and Europe in the global race for AI supremacy.

Centralized vs Decentralized Governance

Artificial intelligence (AI) governance has emerged as a critical challenge for policymakers worldwide. As countries grapple with the rapid development and deployment of AI

technologies, they must strike a delicate balance between promoting innovation, protecting citizens' rights, and mitigating potential risks. Central to this challenge is the question of whether to adopt a centralized or decentralized approach to AI governance. (Mucci & Stryker, 2023)

Centralized AI governance, as exemplified by the European Union's proposed Artificial Intelligence Act (European Commission, 2021), involves a comprehensive, top-down regulatory framework. This approach aims to harmonize rules across member states, prohibit unacceptable AI practices, and impose strict requirements on high-risk applications. Centralized governance emphasizes the role of a central authority in setting standards, conducting assessments, and enforcing compliance. China's AI strategy also exhibits centralized tendencies, with the government setting ambitious national targets, supporting key industries, and regulating algorithmic transparency (Roberts, et al., 2021); (Toner, Creemers, & Webster, 2021).

In contrast, decentralized AI governance, as seen in the United States and the United Kingdom, relies on a more fragmented, industry-led approach. The US, under the Obama and Trump administrations, primarily focused on maintaining American leadership through R&D investment, public-private partnerships, and high-level principles (Hine & Floridi, 2022). Similarly, the UK has proposed a light-touch, sectoral approach that eschews a central AI regulator in favor of oversight by existing regulators within each industry (United Kingdom Secretary of State for Digital, Culture, Media and Sport, 2022). Decentralized governance allows for greater flexibility, innovation, and adaptation to local needs.

Both approaches have their merits and drawbacks. Centralized governance promotes consistency, legal certainty, and the protection of fundamental rights. By establishing clear, enforceable rules, it can help build public trust in AI and prevent a race to the bottom in terms of ethical standards. However, critics argue that centralized governance can be overly rigid, burdensome, and slow to adapt to technological change, potentially hindering innovation (Smuha, 2021); (Veale & Borgesius, 2021).

Decentralized governance, on the other hand, offers more flexibility and room for experimentation. It allows stakeholders to tailor their approaches to specific contexts and

encourages self-regulation and co-regulation. However, decentralized governance risks creating a fragmented, inconsistent landscape that may not adequately protect citizens' rights or provide clear guidance to developers and users of AI systems (Roberts, et al., 2021).

Ultimately, the choice between centralized and decentralized AI governance depends on a country's political, economic, and social context. The EU's centralized approach reflects its commitment to human rights, social protection, and the harmonization of rules across member states. In contrast, the US and UK's decentralized approaches prioritize innovation, competitiveness, and the role of the private sector.

As the AI landscape continues to evolve, countries may need to adopt hybrid approaches that combine elements of centralization and decentralization. This could involve establishing high-level principles and guidelines at the central level while allowing for sector-specific regulation and enforcement. International cooperation and the development of global standards will also be crucial in ensuring that AI is developed and deployed responsibly and ethically. (Amini & Conant. Open AI, 2023)

Thus, the governance of AI presents complex challenges that require balancing competing priorities and adapting to rapid technological change. While centralized approaches offer consistency and protection, decentralized approaches foster innovation and flexibility. As policymakers navigate this landscape, they must carefully consider the unique needs and values of their societies while working towards a common goal of harnessing the benefits of AI while mitigating its risks. (Taeihagh, 2021)

Governance in India

India has recognized the transformative potential of Artificial Intelligence (AI) and has taken significant steps towards establishing a comprehensive AI governance framework. The National Strategy for Artificial Intelligence (NSAI), released by NITI Aayog in 2018, laid the foundation for India's approach to AI, emphasizing the need for responsible AI development and deployment (NITI Aayog, 2018). Subsequently, NITI Aayog released a two-part approach document titled "Responsible AI for All" in 2021. Part 1 of the document identified seven key principles for responsible AI, derived from the Indian Constitution: safety and reliability,

equality, inclusivity and non-discrimination, privacy and security, transparency, accountability, and protection and reinforcement of positive human values (NITI Aayog (Part 1), 2021). These principles serve as a guiding framework for various stakeholders in the AI ecosystem.

Part 2 of the approach document focused on operationalizing these principles through specific mechanisms and recommendations (NITI Aayog (Part 2), 2021). It proposed a risk-based approach to AI regulation, where the level of regulatory scrutiny would be proportional to the potential harm posed by AI systems. Notably, the document recommended the establishment of a multi-stakeholder Council for Ethics and Technology (CET) as an apex advisory body to provide guidance and drive convergence across sectors and states. The proposed CET would serve as an independent, highly participatory entity, bringing together experts from diverse fields such as computer science, law, ethics, social sciences, and industry representatives. Its primary functions would include managing and updating the Principles for Responsible AI, conducting research on the technical, legal, policy, and social aspects of AI governance, enabling access to data and responsible AI tools, and developing India's perspectives on responsible AI to inform global policy discussions.

The CET would work closely with sectoral regulators to develop risk-based regulatory interventions, collaborate with standards agencies to identify relevant benchmarks for the Indian context, and engage with various ministries and state governments to promote responsible AI policies. Additionally, the CET would play a crucial role in creating model documents for responsible AI procurement and designing capacity-building programs for government officials and other stakeholders.

While India has made significant progress in developing its AI governance framework, the regulatory landscape is still evolving. The Personal Data Protection Bill, which aims to establish a comprehensive data protection regime, is currently pending approval (NITI Aayog (Part 2), 2021). Some sectoral initiatives have already been undertaken, such as the Securities and Exchange Board of India (SEBI) issuing reporting requirements for AI and Machine Learning (ML) applications in the financial sector (NITI Aayog (Part 2), 2021). The National Digital Health Mission (NDHM) has also proposed guidelines for the responsible use of AI in healthcare (NITI Aayog (Part 2), 2021).

As India continues to navigate the complexities of AI governance, the establishment of the CET will be a critical step in ensuring a balanced and effective approach. The CET's multi-

disciplinary expertise and collaborative approach will be essential in addressing the challenges associated with AI governance, fostering responsible innovation, and promoting public trust in AI systems. However, the success of India's AI governance framework will also depend on the effective implementation of the proposed measures, as well as the active participation and cooperation of various stakeholders, including the government, private sector, academia, and civil society.

Management Concept – Ambidextrous Governance

The concept of "ambidextrous governance" provides a valuable lens through which to examine the challenges and opportunities of AI governance in India. Ambidextrous governance refers to the ability of organizations and institutions to simultaneously pursue exploratory and exploitative activities, adapting to complex and dynamic environments (Raisch & Birkinshaw, 2008); (Simsek, 2009). In the case of AI governance, policymakers and organizations must balance the need to foster innovation and realize the potential benefits of AI (exploration) with the need to ensure responsible development, mitigate risks, and protect societal values (exploitation). This balance is crucial as India navigates the rapidly evolving AI landscape, seeking to harness the technology's potential while safeguarding the rights and interests of its citizens.

Dynamic Capabilities is a management theory whose core thesis is that the firm must continuously adapt, reconfigure and renew its resources and capabilities in response to the changing business environment in order to achieve and sustain competitive advantage. (Ilídio, 2010), (Teece, Pisano, & Shuen, 1997).

O'Reilly and Tushman (2008) propose that ambidexterity as a dynamic capability requires a set of specific senior team behaviors and organizational processes, including a compelling strategic intent, a common vision and values, a clear consensus among the senior team, separate aligned organizational architectures for exploration and exploitation with targeted integration, and the ability of the senior team to manage the tensions and conflicts that arise. These elements are essential for the successful implementation of an ambidextrous approach to AI governance in India. The concept of ambidextrous governance has been applied to various domains, including innovation management (Jansen, Tempelaar, Bosch, J., & Volberda, 2009), public administration (Smith & Umans, 2015), and technology policy

(Capano & Woo, 2018). In the context of AI governance, ambidextrous governance can be understood as the capacity of policymakers and organizations to develop and implement policies, standards, and practices that simultaneously promote AI innovation and ensure responsible AI development and deployment.

India's approach to AI governance, as outlined in NITI Aayog's "Responsible AI for All" framework, can be seen as an attempt to foster ambidextrous governance. The proposed establishment of the Council for Ethics and Technology (CET) as an apex advisory body aligns with the principles of ambidextrous governance, as it aims to bring together diverse stakeholders to guide responsible AI development while also promoting innovation and competitiveness. The CET's multi-disciplinary expertise and collaborative approach reflect the need for a governance framework that is adaptable and responsive to the complex challenges of AI. By providing strategic guidance and recommendations, the CET can help navigate the tensions between exploration and exploitation, ensuring that India's AI governance framework remains balanced and effective.

Moreover, the principles outlined in the NITI Aayog framework, such as safety and reliability, equality, inclusivity and non-discrimination, privacy and security, transparency, accountability, and protection and reinforcement of positive human values (NITI Aayog (Part 1), 2021), serve as a foundation for ambidextrous governance. These principles guide the development and deployment of AI systems in India, ensuring that the pursuit of innovation is balanced with the need to uphold societal values and mitigate potential risks. The framework's emphasis on a multi-stakeholder approach and the active participation of various actors, including the government, private sector, academia, and civil society, further reinforces the ambidextrous nature of India's AI governance strategy.

As India continues to develop its AI governance framework, the application of ambidexterity as a dynamic capability will be crucial in ensuring its success. By embracing ambidextrous governance, India can position itself as a leader in responsible AI development and deployment, fostering innovation while also ensuring the protection of societal values and interests. This approach requires a sustained commitment from policymakers, organizations, and stakeholders to maintain the delicate balance between exploration and exploitation, continuously adapting to the evolving AI landscape. Through the effective implementation of ambidextrous governance principles and the establishment of robust institutional mechanisms

such as the CET, India can navigate the complexities of AI governance and unlock the technology's potential to drive inclusive growth and societal well-being.

Methodology

This thesis adopts a mixed-methods approach to investigate potential AI governance pathways in India. The research design involves three phases: a comprehensive literature review analyzing existing AI governance frameworks in the EU, US, UK, and China; semi-structured interviews with diverse experts in the Indian AI landscape to gather insights on challenges and opportunities specific to India; and a survey distributed to a targeted sample of the Indian population to gauge public awareness and sentiment regarding AI. By integrating findings from these three phases, this research aims to offer a comprehensive understanding of how India can navigate the complexities of AI governance, drawing on diverse perspectives to identify needs and potential solutions.

Qualitative Analysis – Semi-Structured Interviews

The primary qualitative component of this research consisted of semi-structured interviews conducted with a diverse range of experts in the Indian AI landscape. The selection of participants included representatives from the following categories:

1. Entrepreneurs: Founders, CEOs, and senior executives of AI startups and companies operating in India.

2. Technology Consultants: Professionals who advised organizations on AI strategy, implementation, and governance.

3. Law and Public Policy Experts: Scholars, lawyers, and policy professionals specializing in AI governance, ethics, and regulation.

4. Industry and Technology Experts: Specialists from various sectors, who have experience in AI applications and implications.

The semi-structured nature of the interviews allowed for flexibility in exploring relevant topics while maintaining a consistent focus on key themes related to AI governance in India.

The interviews were designed to elicit insights, opinions, and experiences from the participants, providing a rich, nuanced understanding of the challenges, opportunities, and best practices in AI governance within the Indian context.

Interviewee Code	Interview Category	Company
Expert A	Entrepreneur	Music Generating Platform (Part of Google's Start-up Accelerator Program)
Expert B	Entrepreneur	Defense Startup
Expert C	Entrepreneur	Transport & Fleet Management Startup
Expert D	Entrepreneur	Technology Solutions Service and Consulting Startup
Expert E	Technology Consultant (US Based)	Global Professional Services Consultancy
Expert F	Technology & Policy Consultant	Global Professional Services Consultancy
Expert G	Technology Policy Expert	Research & Public Policy Consulting Firm
Expert H	Technology Policy Expert	Non-governmental, not-for-profit policy think tank
Expert I	Technology Policy Expert	Research & Public Policy Consulting Firm
Expert J	Technology Expert	Technology Solutions Service
Expert K	Technology Expert	Technology Solutions Service
Expert L	Data Governance Expert	Data Solutions Services
Expert M	Academic and AI Expert	Premier engineering institute in India

Table 1

Quantitative Analysis – Public Perception Survey

A public perception survey on AI governance in India complements the qualitative interviews, providing a broader perspective. The survey captures data on public awareness, understanding, and concerns regarding AI technologies, including privacy, bias, and potential misuse. It assesses opinions on government regulation, preferences for governance models, and perceptions of AI's impact on India's development. The survey also explores the public's willingness to share data for AI-driven benefits and identifies who they believe should ensure ethical AI development. By analyzing this quantitative data, we will gain a comprehensive understanding of the Indian public's perceptions and attitudes towards AI governance, complementing the qualitative insights from expert interviews.

Results

Qualitative Analysis – Semi-Structured Interviews

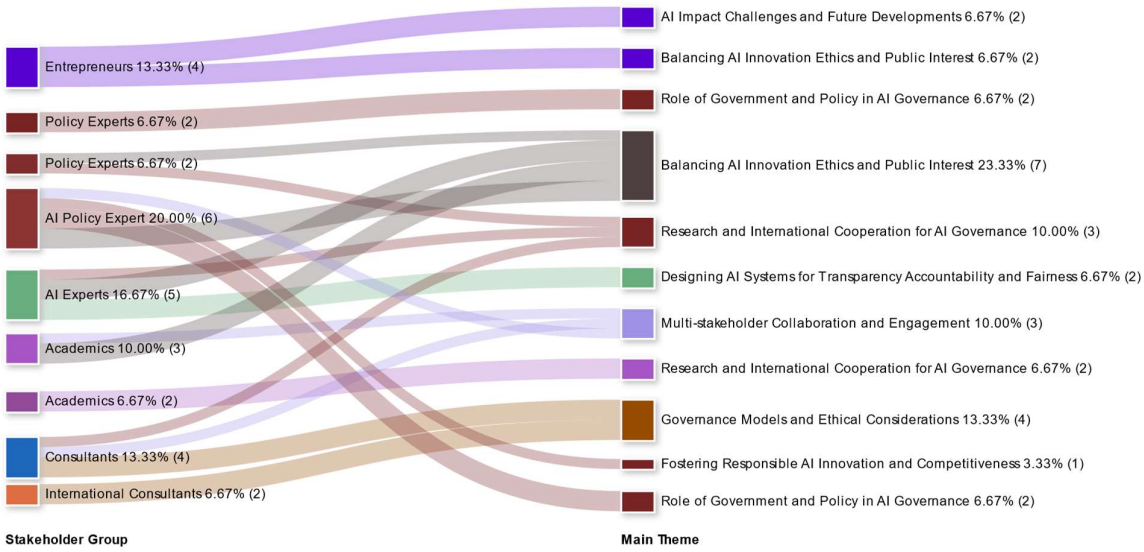

Figure 2

The Sankey chart in **Error! Reference source not found.** illustrates diverse perspectives on AI governance in India among interviewed stakeholders. Entrepreneurs focused on

understanding the AI landscape, while policy experts emphasized the government's role in balancing innovation and ethics. AI experts prioritized responsible AI, academics stressed collaboration, and consultants focused on governance models and ethical frameworks. The need to balance AI innovation with ethical considerations and public interest was a recurring theme.

Group 1: Entrepreneurs

Interviewee A: Emphasized the need for regulation and ethical AI models that prioritize data privacy and consent, while acknowledging cultural differences in India's approach to data privacy.

Interviewee B: Highlighted the challenge of synthetic data in AI development and the importance of responsible AI development and governance through collaboration between industry leaders and the government.

Interviewee C: Stressed the importance of AI governance for responsible AI implementation, focusing on the need for regulation to protect the public interest while fostering innovation and adopting best practices.

Interviewee D: Discussed the impact of AI in India, challenges in AI technology development, and the need for education on data handling and regulation, along with best practices for responsible AI development.

Group 2: Consultants

Interviewee E: Highlighted the lack of AI governance laws in India, emphasizing the need for responsible innovation that balances ethical considerations with the potential of AI to democratize the digital economy.

Interviewee F: Discussed AI governance approaches in different countries, advocating for a decentralized model in India while acknowledging the need to catch up in AI adoption and deployment, and emphasizing responsible AI practices and stronger data privacy regulations.

Group 3: Policy Experts

Interviewee G: Highlighted the Indian government's principle-based approach to AI regulation, addressing data privacy concerns and the need for responsible AI development while maintaining global competitiveness.

Interviewee H: Discussed the evolving approach to AI governance in India, focusing on sectoral regulations, harm-based approaches, and the need for multi-stakeholder collaboration and evidence-based policymaking.

Interviewee I: Compared AI governance models globally, advocating for a balanced approach in India with stricter data privacy regulations and responsible AI development, addressing biases, and fostering collaboration among stakeholders.

Group 4: AI Experts

Interviewee J: Highlighted the complexities of AI governance in India, emphasizing the need to address ethical and societal challenges, data privacy concerns, and lack of public understanding through a collaborative approach.

Interviewee K: Discussed advancements in AI technology in India and their governance implications, focusing on language models, upskilling the government, ethical considerations, designing AI systems aligned with Indian values, and the need for a comprehensive governance framework.

Group 5: Data Governance Expert

Interviewee L: Revealed significant gaps in India's data governance landscape, citing the absence of a comprehensive framework, lack of role-based access controls, inadequate enforcement of existing data protection policies, limited digitization of available data (20-30%), and the complete absence of archival data.

Group 6: Academic AI Expert

Interviewee M: Highlighted the lack of concrete AI regulations in India, emphasizing the need for collaboration among stakeholders, ethical data practices, and research on explainable AI systems, while learning from global governance approaches and establishing clear red lines for AI use cases.

Quantitative Analysis – Public Perception Survey

The survey encompassed 104 respondents, with a slight majority (53%) being female. A significant portion (43%) held bachelor's degrees, and nearly half (47%) reported moderate technical proficiency, indicating comfort with software and applications. However, only a minority (21%) demonstrated a strong understanding of AI governance concepts. The survey saw most respondents from the following age groups: 18-24 (26%), 25-34 (20%), and 45-54 (29%).

Using technical prowess as a common dependent variable, we compared it against all perceived independent variables collected in the survey. This approach proved effective as technical prowess served as a proxy for respondents' understanding of the current and future state of artificial intelligence, influencing their perceptions of potential AI risks, trust in government and private sectors, and opinions on data protection and control.

The following report presents the results of a survey exploring the relationship between self-assessed technical prowess and concerns regarding various governance vectors associated with AI systems.

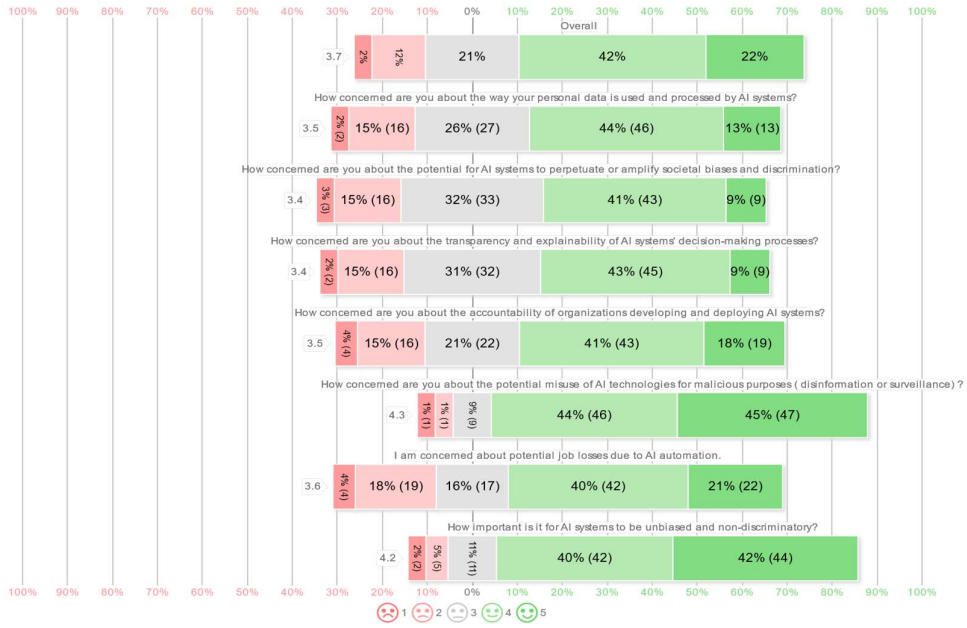

Figure 3

1. Concerns about the use of personal data in AI Systems:

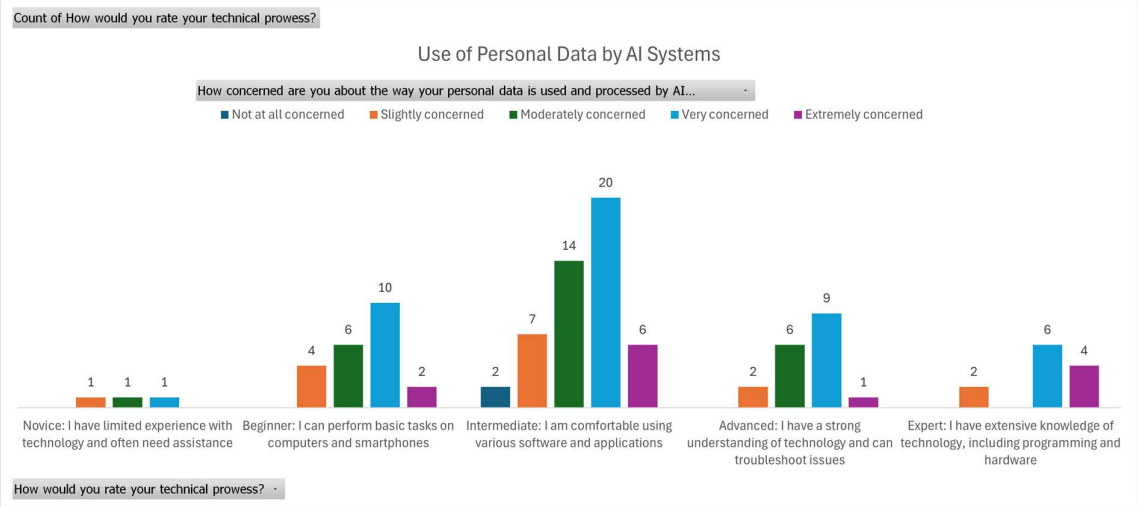

Figure 4

1. **Overall Concern Levels:**

- A significant proportion of respondents (44.2%) expressed being "Very concerned" about their personal data being used by AI systems.
- The second largest group (25.9%) indicated that they are "Moderately concerned."
- 15.4% reported being "Slightly concerned."

- 12.5% stated they were "Extremely concerned."
- Only a small minority (1.9%) said they were "Not at all concerned."

2. **Concern Levels by Technical Expertise:**

- The highest levels of concern was found among respondents who self-identified as "**Intermediate**" users, with 20 (40.8%) indicating they were "Very concerned", 6 (12.2%) being “Extremely concerned” and 14 (28.6%) stating "Moderately concerned."
- "**Beginners**" also showed a notable level of concern, with 10 (45.5%) being "Very concerned" and 6 (27.3%) "Moderately concerned."
- Respondents who identified as "**Experts**" also displayed a high level of concern, with 6 (50%) indicating they were "Very concerned" and 4 (33.3%) being "Extremely concerned."
- Among those who classified themselves as "**Advanced**," 9 (50%) were "Very concerned" and 6 (33.3%) were "Moderately concerned."
- The "**Novice**" group had an even distribution with respondents equally being “Slightly,” “Moderately,” and “Very” concerned.

2. Concerns about use of AI to perpetuate or amplify societal biases and discrimination:

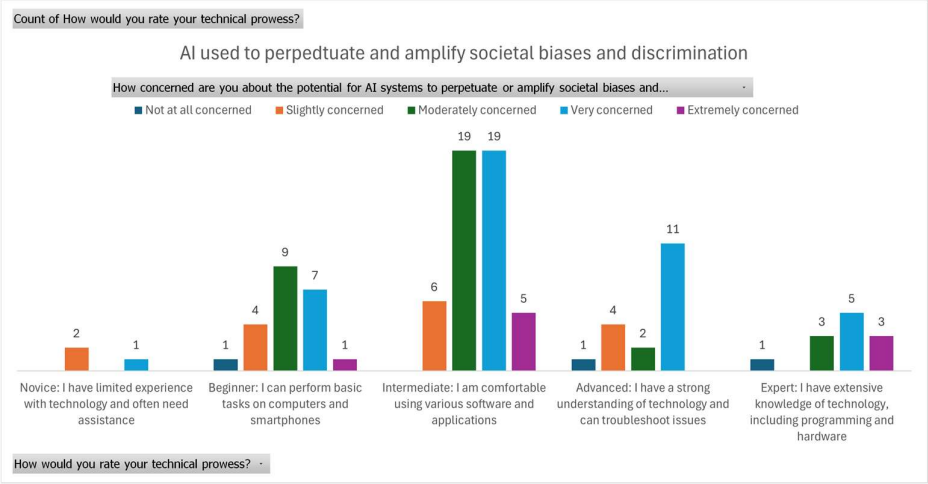

Figure 5

1. **Overall Concern Levels:**

- A significant portion of respondents (43 or 41.3%) expressed being "Very concerned" about AI perpetuating societal biases.
- 9 respondents (8.7%) reported being "Extremely concerned."
- "Moderately concerned" was the sentiment of 33 individuals (31.7%).
- Only a small fraction (3 or 2.9%) indicated they were "Not at all concerned."

2. **Concern Levels by Technical Expertise:**

- "**Intermediate**" users demonstrated the some concern, with 19 (38.8%) "Very concerned" and another 19 (38.8%) were "Moderately concerned."
- "**Beginners**" followed closely, with 7 (31.8%) "Very concerned" and 9 (40.9%) "Extremely concerned."
- "**Advanced**" users showed the most concern level, with 11 (61.1%) "Very concerned."
- Among "**Experts**," 5 (41.6%) were "Very concerned," and 3 (25%) were "Extremely concerned."
- "**Novices**" expressed the least concern, with only 2 (66.6 %) "Not at all concerned" and 1 (33.3%) "Very concerned."

3. Concerns about AI Accountability from Organizations:

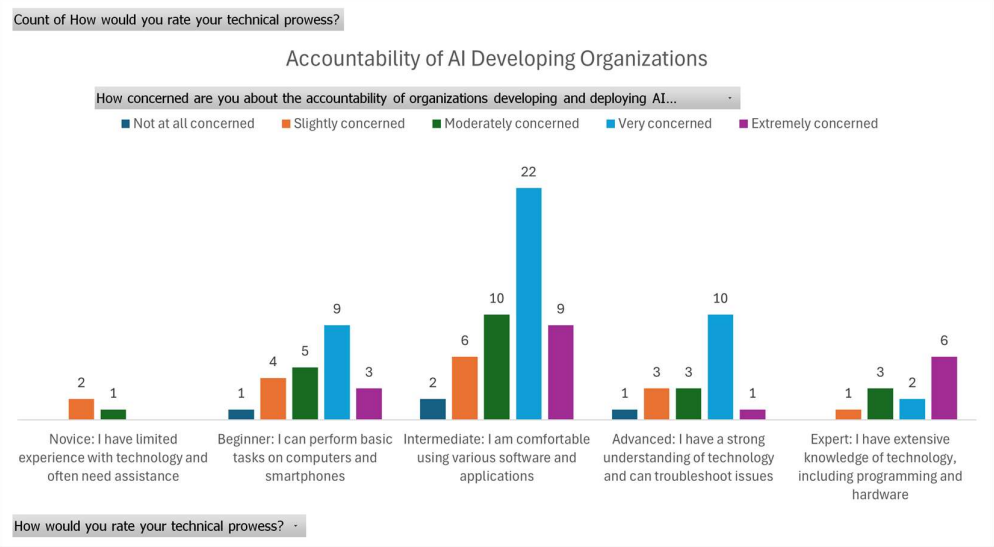

Figure 6

Overall Concern Levels:

- A significant portion of respondents (43 individuals, 41.3%) expressed being "Very concerned" about AI accountability.
- The second largest group (22 individuals, 21.2%) indicated they are "Moderately concerned."
- 19 respondents (18.3%) reported being "Extremely concerned."
- 16 respondents (15.4%) expressed being "Slightly concerned."
- Only a small fraction (4 individuals, 3.8%) indicated they were "Not at all concerned."

Concern Levels by Technical Expertise:

- **Intermediate** Users: This group displayed the highest level of concern, with 22 individuals (45%) "Very concerned," 9 individuals (18.3%) "Extremely concerned" and 10 individuals (20.4%) “Moderately concerned.”
- **Beginners**: This group also exhibited a high level of concern, with 9 individuals (41%) "Very concerned."
- **Advanced** Users: Concern remained notable in this group, with 10 individuals (55.5%) "Very concerned."
- **Experts**: This group showed a moderate level of concern, with 3 individuals (20%) "Very concerned" and 5 individuals (33.3%) "Slightly concerned."
- **Novices**: This group demonstrated the highest level of “Extreme” concern across all categories, with the majority (6 individuals, 50%).

4. Concerns about the Potential Misuse of AI for Malicious Purposes:

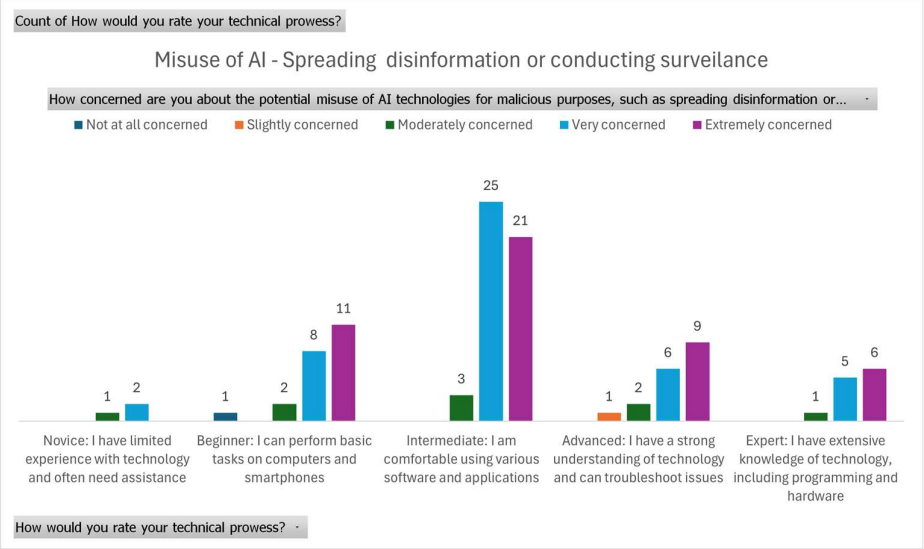

Figure 7

1. **Overall Concern Levels:**

- Most respondents expressed some level of concern, with "Extremely concerned" being the most common response (47 respondents, 45.2%).
- "Very concerned" was the second most frequent response (46 respondents, 44.2%), followed by "Moderately concerned" (9 respondents, 8.6%).
- Only a few respondents stated they were "Not at all concerned" and “Slightly Concerned” (1 respondent, 1%).

2. **Concern Levels by Technical Expertise:**

- **Beginners:** This group exhibited the highest level of extreme concern, with 11 respondents (50%) selecting this option.
- **Intermediate Users:** This group showed the highest level of "Very concerned" responses, with 25 respondents (51%).
- **Advanced Users:** Concern remained notable in this group, with 6 respondents (33.3%) being "Very concerned" and 9 (50%) "Extremely concerned."
- **Experts:** This group showed a relatively even distribution of concern, with 5 respondents (41.6%) in "Very concerned" and 6 respondents (50%) "Extremely concerned" categories.

- **Novices:** This group had the highest proportion of "Very concerned" responses (2 respondents, 66.7%).

Data Control and Data Sharing:

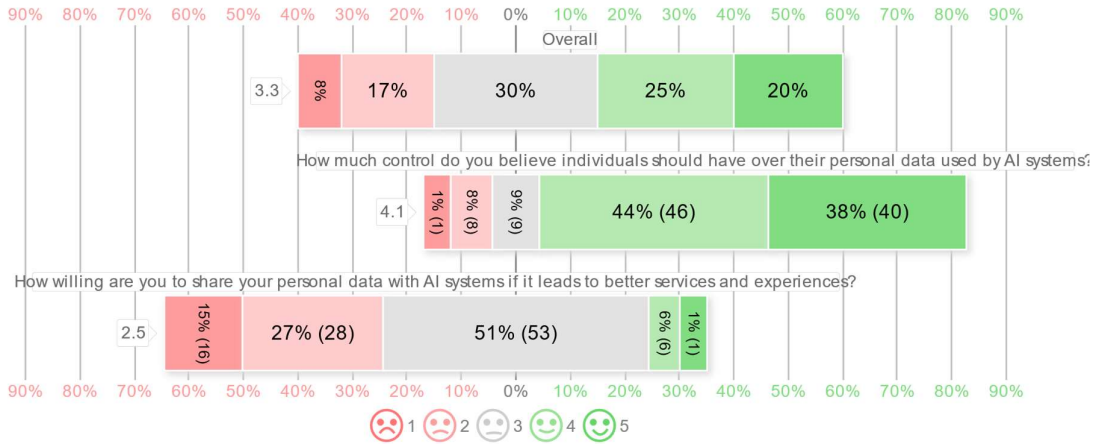

Figure 8

5. Desired Control over Personal Data Used by AI Systems:

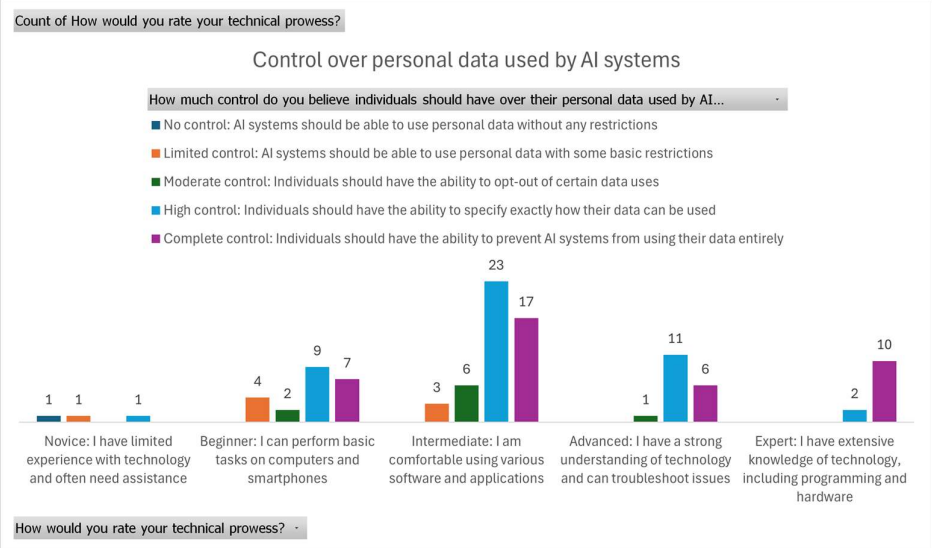

Figure 9

Overall Preferences:

- Most respondents (46 individuals, 44.2%) expressed a desire for "High control," indicating a preference for specifying exactly how their data can be used.
- The second most popular choice was "Complete control" (40 individuals, 38.5%), suggesting a significant portion of respondents want to prevent AI systems from accessing their data entirely.
- Fewer respondents opted for "Moderate control" (9 individuals, 8.7%) and "Limited control" (8 individuals, 7.7%).
- Only one respondent (1%) chose "No control," indicating a widespread desire for some level of control over personal data used by AI.

Preferences by Technical Expertise:

- **Intermediate Users:** This group showed the strongest preference for "High control" (23 respondents, 46.9%) and 17 (34.7%) individuals selected “Complete control”.
- **Beginners:** This group was most divided, with a significant number choosing both "High control" (9 respondents, 40.9%) and "Complete control" (7 respondents, 31.8%).
- **Advanced Users:** Like beginners, this group was also split between "High control" (11 respondents, 61.1%) and "Complete control" (6 respondents, 33.3%).
- **Experts:** This group showed a clear preference for "Complete control" (10 respondents, 83.3%), indicating a higher desire for data privacy.
- **Novices:** This group primarily opted for "Moderate control" and “No control” (1 respondent each, 33.3%).

Trust in the Government and Private Organizations to manage AI:

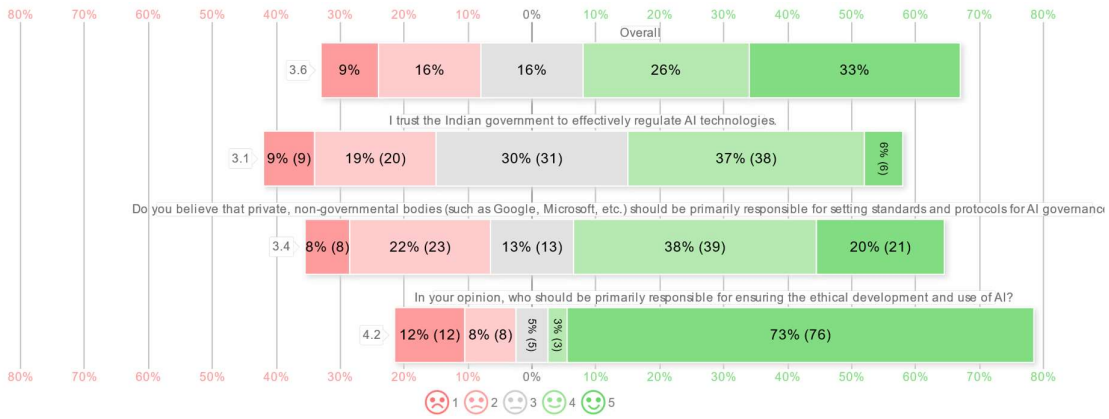

Figure 10

6. Analysis of Trust in AI Governance: A Comparison of Public and Private Sector Roles

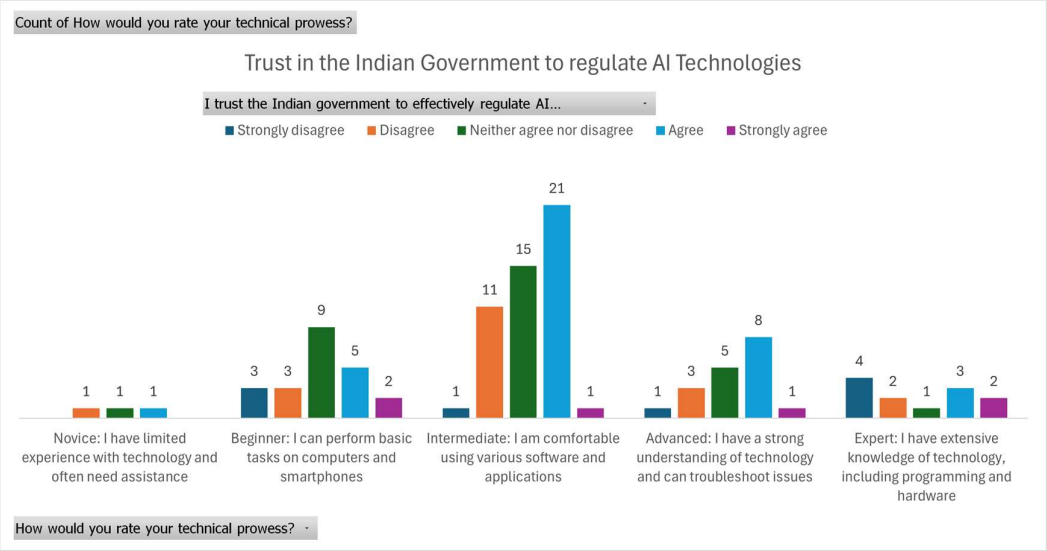

Figure 11

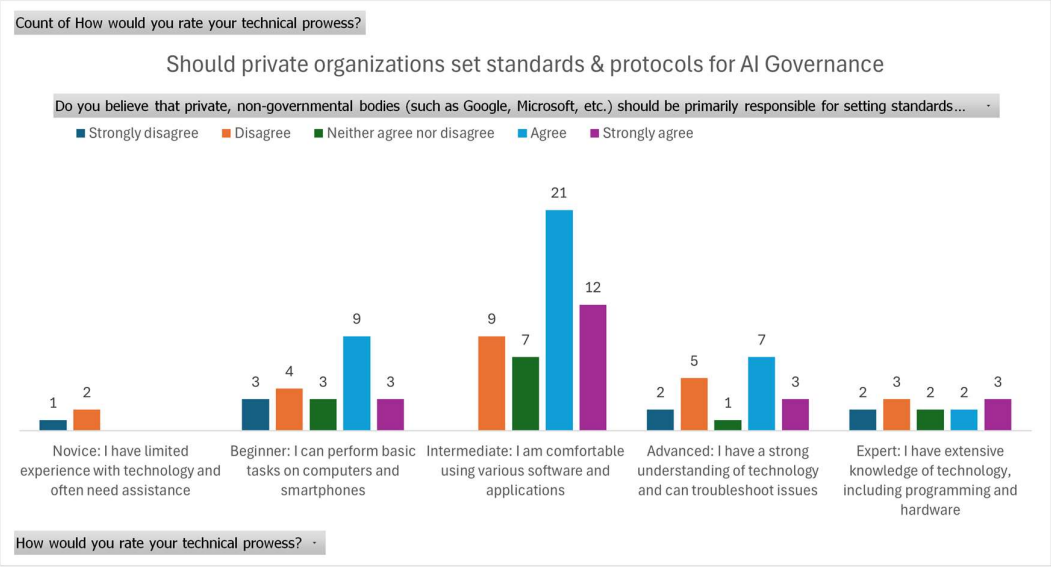

Figure 12

Overall Findings

Government Regulation (Figure 11):

- There is a lack of strong confidence in the Indian government's capacity for effective AI regulation.

- While 42.3% of respondents agreed with the statement that the government can effectively regulate AI, a combined 27.8% disagreed, and 29.8% remained neutral.

Private Sector Standards (Figure 12):

- There is significant, though not absolute, trust in private organizations to set AI standards and protocols, with 57.69 of respondents agreeing with this notion.
- However, skepticism exists, as indicated by the 29.8% of respondents who disagreed.

Preferences by Technical Expertise

Government Regulation:

- **Intermediate users** demonstrated the highest trust levels. (42.9%, 21 agreed).
- **Experts** exhibited the most distrust, with 33.3% disagreeing and only 25% agreeing.
- **Novices** were evenly distributed in their responses.
- **Beginners** leaned slightly toward disagreement (22.7%.)
- **Advanced users** mostly trust in Government's ability to regulate AI (9 individuals, 50%)

Private Sector Standards:

- **Intermediate users** again showed the highest agreement levels with 21 respondents (42.8%) selecting "Agree" and 12 (24.4%) marking "Strongly agree.

- **Experts** were the most likely to disagree (41.66%) and chose either "Disagree" or "Strongly disagree".
- **Beginners** and advanced users displayed similar patterns, with "Agree" being their most common response.
- **Novices** leaned toward disagreement.

7. Responsibility for Ensuring Ethical AI Development & Use:

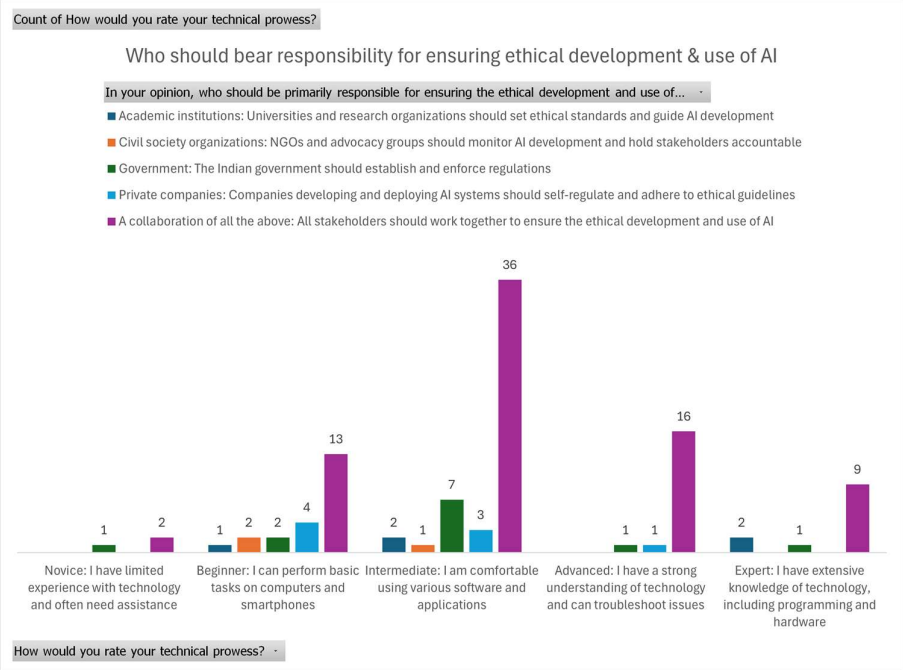

Figure 13

Overall Findings:

- The most popular response was "A collaboration of all the above" (76 respondents, 73%), highlighting a strong belief in a multi-stakeholder approach to AI governance.
- "Government" was the second most preferred option (12 respondents, 11.5%), indicating a significant expectation of regulatory oversight.
- "Private Companies" (8 respondents, 7.7%) and "Academic Institutions" (5 respondents, 4.8%) received moderate support.
- "Civil Society Organizations" garnered the least support (3 respondents, 3%).

Responsibility Preferences by Technical Expertise:

- **Novices**: Showed the strongest preference for a multi-stakeholder regulation (2 respondents, 67%).
- **Beginners**: Were most inclined towards a collaborative approach (13 respondents, 59%).
- **Intermediate**: Also favored collaboration (36 respondents, 73.5%), but with a notable preference for government regulation (7 respondents, 14.3%).

- **Advanced**: Overwhelmingly supported collaboration (16 respondents, 89%), with a minor inclination towards academic institutions and the Government (1 respondent each, 5%).
- **Experts**: Also heavily favored collaboration (9 respondents, 75%), but were more evenly split between government (1 respondent, 8.3%) and academic institutions (2 respondents, 16.7%) for secondary responsibility.

Regulation vs Innovation in AI Governance:

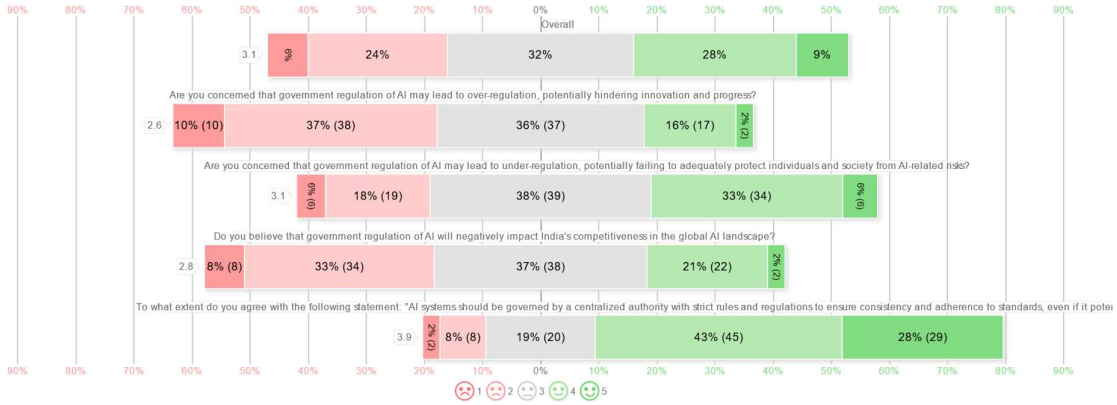

Figure 14

8. Analysis of Concerns Regarding Government Regulation of AI: A Focus on Over and Under-Regulation

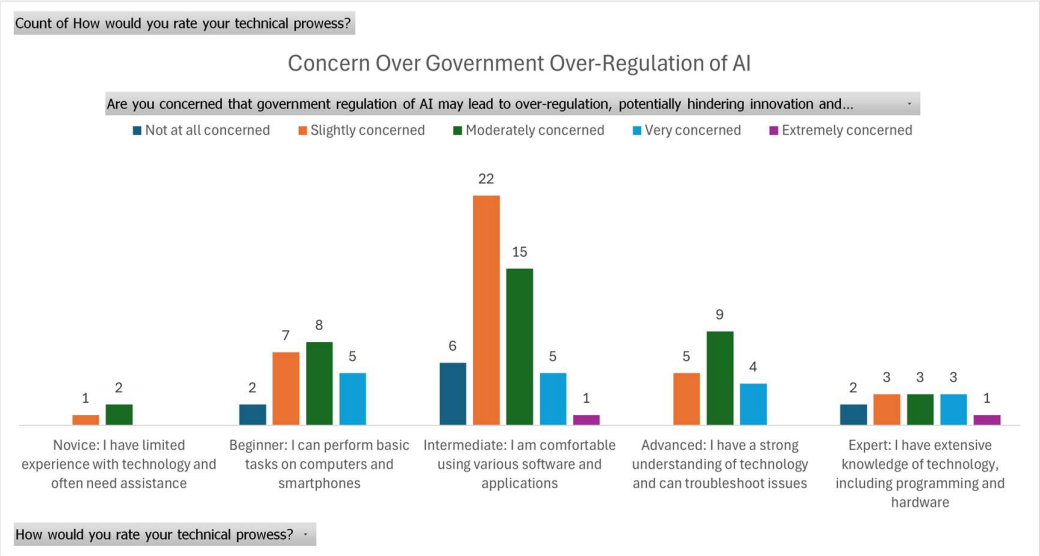

Figure 15

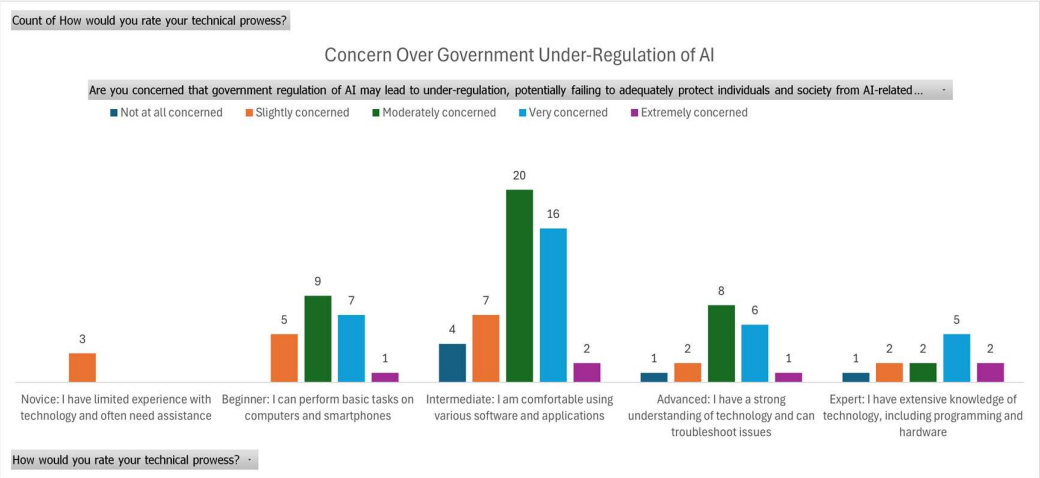

Figure 16

Overall Findings:

Over-Regulation (Figure 15**):** A majority of respondents expressed at least some level of concern regarding the over-regulation of AI

- "Slightly concerned" was the most common response (36.5%).
- This was followed by "Moderately concerned" (35.6%), "Very concerned" (16.3%), and "Extremely concerned" (1.9%).
- Only a small minority (9.6%) were "Not at all concerned."

Under-Regulation (Figure 16Error! Reference source not found.**):** Similarly, a significant majority expressed concern over potential under-regulation of AI

- "Moderately concerned" was the most frequent response (37.5%).
- This was followed by "Very concerned" (33%), and "Slightly concerned" (18.3%).
- A small minority (5.76%) indicated they were "Not at all concerned" or "Extremely Concerned."

Concern Levels by Technical Expertise:

Over-regulation

- **Novice:** Predominantly "Moderately concerned" (67%).
- **Beginner:** Mostly "Slightly concerned" (32%), followed by "Moderately concerned" (36.36%).
- **Intermediate:** Most "Slightly concerned" (44.9%), closely followed by "Moderately concerned" (30.6%).
- **Advanced:** "Moderately concerned" (18.4%) and "Slightly concerned" (27.7%) were the most common.
- **Expert:** A more even distribution across "Slightly," "Moderately," and "Very concerned" (25% each), followed by "Not at all concerned" (16.66%) and "Extremely concerned" (8.3%).

Over-regulation

- **Novice:** Predominantly "Moderately concerned" (67%).
- **Beginner:** Mostly "Slightly concerned" (32%), followed by "Moderately concerned" (36.36%).
- **Intermediate:** Most "Slightly concerned" (44.9%), closely followed by "Moderately concerned" (30.6%).
- **Advanced:** "Moderately concerned" (18.4%) and "Slightly concerned" (27.7%) were the most common.
- **Expert:** A more even distribution across "Slightly," "Moderately," and "Very concerned" (25% each), followed by "Not at all concerned" (16.66%) and "Extremely concerned" (8.3%).

9. Impact of Government AI Regulation on India's Global AI Competitiveness:

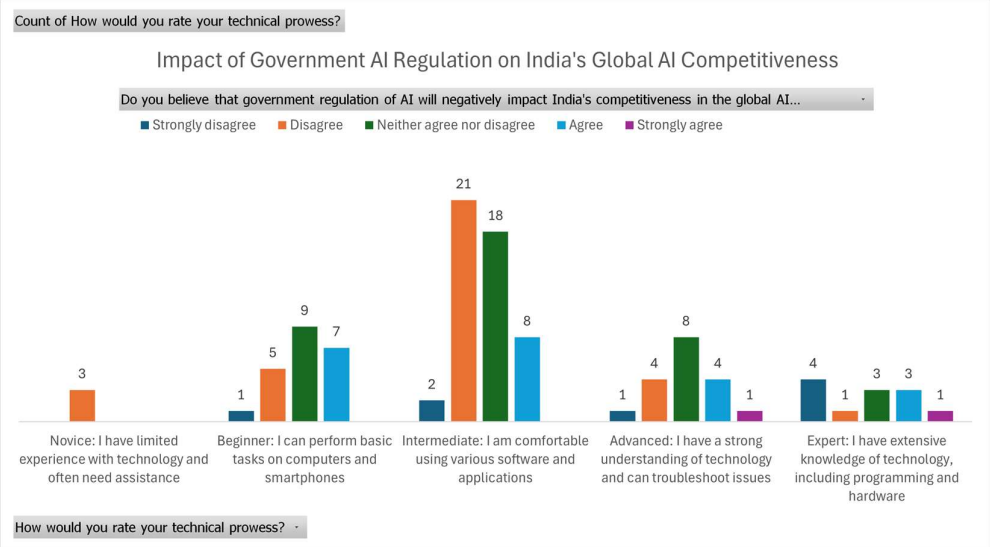

Figure 17

Overall Perceptions:

- A plurality of respondents (38 individuals, 36.5%) neither agreed nor disagreed with the statement, indicating a degree of uncertainty or neutrality on the issue.
- The second most common response was "Disagree" (34 individuals, 32.7%), suggesting a considerable portion of respondents do not believe government regulation would negatively impact India's AI competitiveness.
- A smaller but significant portion (22 individuals, 21.2%) agreed with the statement, expressing concern about potential negative impacts.
- Only a few respondents strongly agreed (2 individuals, 1.9%) or strongly disagreed (8 individuals, 7.7%).

Perceptions by Technical Expertise:

- **Novice**: This group predominantly disagreed with the statement (3 individuals, 100%), indicating they do not believe government regulation would harm India's AI competitiveness.
- **Beginner**: This group was more evenly split, with the highest number (9 individuals, 41%) neither agreeing nor disagreeing, followed by those who agree (7 individuals, 31.8%) and those who disagree (5 individuals, 22.7%.)

- **Intermediate**: This group had the most respondents who disagreed (21 individuals, 42.85%), expressing no concern about potential negative impacts of regulation. The next majority neither agreed nor disagreed (18 individuals, 36.7%.)
- **Advanced**: In this group, the most common response was neither agree nor disagree (8 individuals, 45%), followed by disagree (8 individuals, 44.4%).
- **Expert**: This group had the highest proportion of respondents who strongly disagreed (4 individuals, 33.3%), a significant portion of the respondents agreed (3 individuals, 25%) and an equal number who neither agreed nor disagreed (3 individuals, 25%.)

10. Attitudes towards Centralized AI Governance in India:

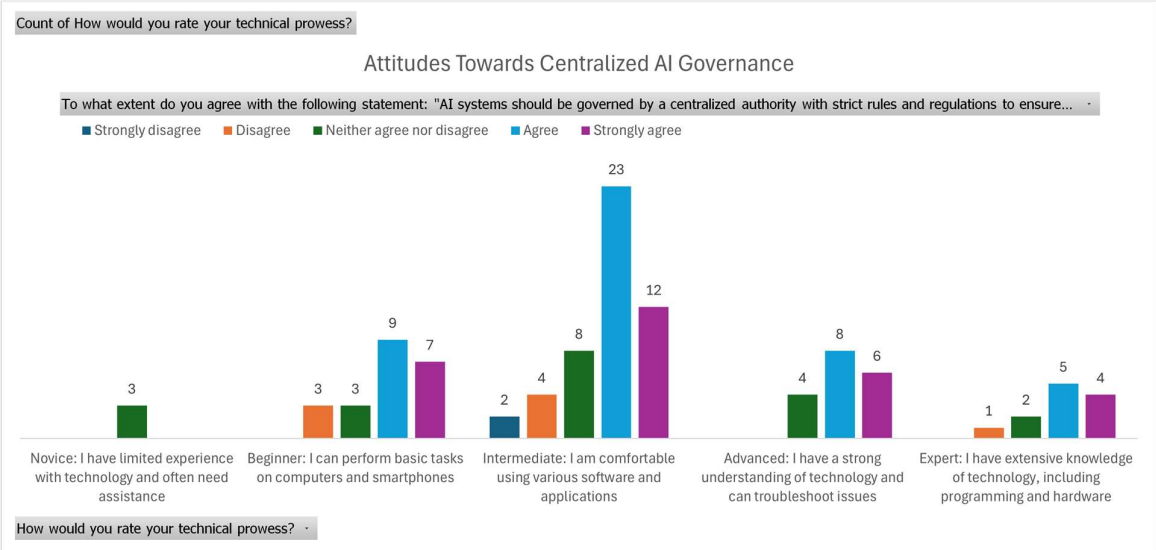

Figure 18

Overall Findings:

The most common response was "Agree" (45 respondents, 43.3%), indicating a significant preference for centralized AI governance.

"Neither Agree nor Disagree" (20 respondents, 19.2%) and "Strongly agree" (29 respondents, 28%) were the next most frequent responses, suggesting a major portion of the population holds a neutral or agreeable stance.

Fewer respondents selected "Disagree" (8 respondents, 8%) or "Strongly Disagree" (2 respondents, 1.9%).

Attitudes by Technical Expertise:

- **Novices:** Demonstrated a neutral take with centralized governance, with all respondents choosing to neither agree nor disagree (3 respondents, 100%.)
- **Beginners:** Were more inclined towards centralized governance, with most respondents agreeing (9 respondents, 41%) or having a neutral stance (7 respondents 31.8%).
- **Intermediate:** This group had the highest number of respondents agreeing with the statement (23 respondents, 47%) and most respondents strongly agreed (12 individuals, 24.48%), indicating a clear preference for centralized AI governance.
- **Advanced:** Showed a unanimous agreement similar to the Intermediate group, with the most common response being "Agree" (8 respondents), followed by "Strongly agree" (6 respondents, 33.3%.)
- **Experts**: This group had the most diverse opinions, with a relatively even distribution across the "Disagree" (1 respondent, 8.3%,) "Neither Agree Nor Disagree" (2 respondents, 16.6%,) "Agree" (5 respondents, 41.6%,) and “Strongly agree” (4 respondents, 33.3%) categories.

Discussion

This section presents insights gathered from interviews with AI experts and the public perception survey, focusing on five key themes: Lack of Comprehensive Regulatory Framework, Data Privacy and Security Concerns, Balancing Innovation and Regulation, Ethical Considerations and Bias Mitigation, and Multi-stakeholder Collaboration. Through an in-depth exploration of these themes, the discussion section aims to provide a nuanced understanding of the current AI governance landscape in India.

Theme 1: Lack of Comprehensive Regulatory Framework –

The lack of a comprehensive regulatory framework for AI in India is a significant concern among AI experts, as evidenced by the insights shared by various interviewees. The current AI governance landscape in India is characterized by a fragmented approach, with a focus on sectoral regulations and a shift away from an overarching AI law. Interviewees highlighted the need for a more structured, transparent, and collaborative approach to AI governance, considering India's unique context and challenges.

Interviewee C emphasized the importance of prioritizing monitoring and evaluation before implementing regulations. They suggested that the government should focus on understanding which companies are working on AI, their targets, and the data they possess. This vigilance in monitoring AI companies is crucial for effective governance.

Interviewee D pointed out the limitations in India's AI ecosystem, including limited R&D investment, financial constraints for researchers with unconventional ideas, and the lack of powerful compute resources. To address these challenges, they proposed adaptive policies with clear guidelines and guardrails, allowing for flexibility and gradual evolution. They also suggested a layered approach, prioritizing a strong data protection framework as the foundation, followed by industry-specific policies.

Interviewee G highlighted the interconnectedness of AI regulation with other legislation, such as the Digital Personal Data Protection Act (DPDP) and the Digital India Act. The government's focus on principle-based legislation, consumer empowerment, and sectoral rules was emphasized. The influence of EU laws on Indian regulations was also noted, with the Digital India Act focusing on open, trust, safe, and accountable principles.

Interviewee H discussed the shift from an overarching AI framework to application-specific regulations, with domain-specific ministries playing a more active role. They highlighted the importance of addressing specific harms caused by AI, such as deepfakes, and striking a balance between encouraging beneficial AI use cases and mitigating potential misuses. The speaker also noted the increasing adoption of AI by the government itself, which may influence its approach to regulation.

Interviewee I proposed a nuanced approach to AI regulation, balancing innovation and consumer protection. They suggested adopting a risk-based approach, learning from the EU's AI Act while considering industry feedback and India's unique needs. The speaker emphasized the importance of international collaboration and developing effective and balanced regulations that foster innovation while ensuring adequate consumer protection.

Interviewee K stressed the critical role of enforcement in ensuring responsible AI development and use. They argued that the government must create a platform that encourages responsible innovation while maintaining oversight. The speaker also highlighted the need for vigilance from citizens in holding both the government and enterprises accountable.

Interviewee M pointed out the current lack of concrete laws or regulations governing AI in India, despite the existence of various vision documents and white papers. They emphasized that existing documents were speculative and lacked clear guidance for AI governance, and there was no official statement from the government outlining its intentions for framing and regulating AI in the future.

Similarly, the survey respondents believe that a centralized regulatory framework would be ideal to govern AI systems with 71% of the responses being positive. The respondents also showed little trust in the government to regulate AI technologies, with 42.3% of the respondents agreeing and 30% of the respondents choosing to stay neutral. In contrast, 58% of the respondents believe that private organizations should set standards and protocols for AI Governance. This could mean that at present people have more faith in companies setting standards for responsible AI and data protection than the government, due to the absence of any regulations.

The insights shared by the interviewees underscore the urgent need for a comprehensive, well-structured regulatory framework for AI in India that addresses the country's unique challenges and opportunities.

Theme 2: Data Privacy & Security Concerns -

Data privacy and security concerns are a significant theme arising from interviews with AI experts in India. The interviewees highlighted various challenges related to data governance, including the lack of a robust data protection framework, and India's unique socio-cultural context.

Interviewee A emphasized the need for transparency and disclosure from companies regarding the datasets used for training AI models and obtaining user consent when collecting data. They also suggested that governments should implement regulations to prevent unauthorized data scraping from social platforms and other sources to protect user privacy and intellectual property rights.

Interviewee D pointed out the challenges related to data availability and access in India, exacerbated by the lack of an open-source culture. They also highlighted the shift in data handling from structured to unstructured data, necessitating new infrastructure and expertise, and proposed industry-specific frameworks, robust data protection laws, and consideration of India's unique context to address these challenges.

Interviewee G highlighted the differences in approach between the Indian government and Western countries like the EU regarding data protection. They argued that the government's ex-ante regulation prioritized data protection but lacked consideration for individual autonomy, unlike the GDPR, which focuses on individual consent and control. The interviewee emphasized the need for a nuanced approach that considers cultural differences and individual privacy concerns in India.

Interviewee H discussed the challenge of addressing algorithmic discrimination in the context of India's diversity, which could amplify existing societal biases. They suggested that a technology-agnostic anti-discrimination law, like the UK's equality law, would be more effective than AI-specific regulations in providing a framework for addressing algorithmic bias and other forms of discrimination.

Interviewee I focused on the challenges faced by big tech companies due to frequent changes in data protection laws, such as the DPDP Act, and the need for further clarifications. They highlighted the importance of balancing strictness and flexibility in the law, ensuring proper implementation, and addressing the "privacy paradox," where consumers prioritize convenience over data privacy. Conversely, Interviewee M noted that while India has a data protection law, it is limited in scope and treats data primarily as a commodity, neglecting its role in labor relations and personal identity.

Interviewee K pointed out the lack of data governance in Indian companies and the growing threat to consumer data security. They emphasized the need for consumer education, learning from past mistakes like the HL7 leaks in the US, and balancing choice and knowledge to create a strong data governance framework in India.

In tandem to the expert insights, the survey results show that 56.7% of the survey respondents agreed to being concerned about the way their private data is used by AI systems. 83% of respondents said that they wanted either high (44%) or complete control over their data (38%.) While most of the respondents were “moderately” willing to share their personal data for AI development (51%.) This shows that while people are worried about how their data is being used, if given autonomy over their data use and protection, people would be more willing to share their data on their own terms.

The interviewees highlighted the complex challenges surrounding data privacy and security in India, emphasizing the need for a robust data governance framework that balances innovation, individual rights, and responsible data use.

Theme 3: Innovation vs Regulation -

Balancing innovation and regulation is a critical challenge in developing India's AI ecosystem. Interviewees provided insights into factors influencing this balance, such as the country's late adoption of AI, education system limitations, and focus on applications over foundational research.

Interviewee A highlighted India's tendency to follow Western trends, resulting in a lack of original foundational models and a focus on adapting existing technologies. They pointed out

that the Indian education system's emphasis on rote learning hinders research and application, leading to a brain drain of talent.

Interviewee D noted the talent density disparity between India and other countries, attributing it to limited funding for innovative ideas and contrarian research. They cautioned that overly strict government regulations could harm India's ease of doing business.

Interviewee F emphasized the need for India to prioritize AI application development and deployment, learning from practical use cases and avoiding over-regulation. They suggested focusing on appropriate governance frameworks after successful AI implementation.

Interviewee H discussed the relationship between regulation and innovation, suggesting they are not mutually exclusive. They cite the Telangana government's AI procurement guide as a promising effort to create safeguards and increase confidence in AI services.

Interviewee K highlighted the advancements in Indic language models as a major contribution from India to the AI field. They emphasize the need for the government to enhance its understanding of AI's potential dangers.

Interviewee M argued that the relationship between regulation and innovation is complex, and that India needs a strong welfare state with investments in education and infrastructure to foster innovation, focusing on creating a strong foundation for a digital economy.

In line with the expert views, the survey respondents did not show a lot of concern about the risk of over-regulation, however concerns over the under-regulation of AI were seen increasingly with the increasing technical prowess. 38.4% of the respondents said that they were “very” to “extremely” concerned, while 37.5% of the respondents were “moderately” concerned. In line with interviewees M and H, the survey did not show any significant concern over AI regulation hampering India’s global competitiveness. However, some concern was increasingly seen in the beginner, intermediate, advanced and expert categories.

Balancing innovation and regulation requires a nuanced approach considering India's unique challenges and opportunities, with a focus on increased investment in foundational research, collaboration between stakeholders, and developing appropriate governance frameworks.

Theme 4: Ethical Considerations and Bias Mitigation –

Ethical considerations and bias mitigation are crucial aspects of AI governance in India. The interviewees provide varied perspectives on the priorities and challenges surrounding these issues.

Interviewee F highlighted the differing priorities in AI governance between developed and developing countries. Wealthy countries like the US and Europe, already leading in AI development, are prioritizing discussions on potential harms and legal issues associated with AI. In contrast, countries in Asia and India are primarily focused on leveraging AI technology to catch up with developed nations in terms of AI capabilities. The interviewee also raised questions about defining and measuring bias in AI systems, emphasizing the subjective nature of terms like fairness and the lack of judgment and emotion in AI.

Interviewee I emphasized that bias mitigation is a core principle of responsible AI, involving the identification and addressing of biases in AI algorithms and outputs. They pointed out the accountability challenges, with a lack of clarity on who is responsible for mitigating bias in AI systems. The interviewee suggested a combination of voluntary adoption of responsible AI tools and practices by companies, supplemented by regulations that require bias detection and mitigation in AI tools. They also highlighted the concept of "bias mitigation by design," which emphasizes incorporating bias mitigation measures into the development process of AI systems from the outset.

Interviewee K focused on the threat of misinformation posed by generative AI, which has made it significantly easier and faster to create convincing misinformation. They emphasized the need for stricter controls and monitoring over access to model weights to prevent malicious actors from recreating and misusing AI models. The interviewee also stressed the importance of developing anti-LLM systems to detect AI-generated text and combat misinformation. Additionally, they highlighted the lack of accountability for AI misuse, the impact of AI on employment, and the government's lack of preparedness to address these challenges.

Interviewee M suggested that the current discourse on AI regulation in India was immature and lacked a nuanced understanding of the relationship between regulation and innovation. They also pointed out that ethical considerations in AI, such as bias and fairness, are complex and require careful consideration in the Indian context.

AI misuse is a great concern for everyone, 89% of the survey population showed concern over this. The ethical dilemma of job loss due to AI automation is also a big concern amongst the survey participants (61.5%.) This concern seemed to be lower with the expert category, alluding to the technological knowledge gap in the current job market. 83% of the respondents also believed that AI systems should be unbiased and non-discriminatory. This sentiment increased in the technically knowledgeable categories.

Addressing ethical considerations and bias mitigation in India's AI ecosystem requires a multi-faceted approach that considers the country's unique priorities and challenges.

Theme 5: Multi-Stakeholder Collaboration –

Multi-stakeholder collaboration is a crucial aspect of developing effective AI governance frameworks in India. The interviewees provide insights into the importance of involving various stakeholders, including the government, industry, academia, and civil society, in the policymaking process.

Interviewee C highlighted the need for domain expertise in government and the importance of industry collaboration in policymaking. They stressed the critical role of engaging with the industry, particularly the deep tech industry, in creating policies rather than making them in isolation. The interviewee also pointed out the need for regulations that cover startups and not just big players.

Interviewee D suggested that the focus should shift beyond policies towards actionable initiatives that foster collaboration between startups, corporations, and the government. This includes providing accessible funding options and programs that encourage innovation and the development of unique solutions. They also emphasized the importance of the government expanding its engagement beyond large corporations and actively involving agile startups in AI-related projects.

Interviewee G noted a shift in India's multi-stakeholder approach to AI regulation, with a decrease in the government's acceptance of stakeholder feedback in recent legislations. This raises concerns about the effectiveness of the multi-stakeholder approach and the extent to which industry concerns are being considered in shaping AI regulations.

Interviewee K highlighted the need for collaborative solutions involving government, industry, and academia to address ethical challenges and develop solutions that balance innovation with responsible AI use. They also highlighted the importance of preventing AI misuse, adhering to best practices in app security, data governance, and encryption, and the government's crucial role in regulating AI, especially in sectors like healthcare.

Interviewee M emphasized the importance of collaboration between government, industry, academia, and civil society in developing effective AI regulations. They also pointed out the need for a multi-stakeholder approach to create a comprehensive framework for a thriving digital economy, given the current lack of regulation in the Indian IT industry. However, the speaker acknowledged the challenges in collaboration due to conflicting interests and rivalrous mechanisms between stakeholders, such as the inherent conflict between protecting citizen rights and maximizing business profits. They stressed the need for balance between collaboration and competition to avoid collusion and ensure that innovation does not come at the cost of citizens' rights. The speaker advocated for a nuanced approach to AI governance that considers the diverse interests of all involved parties while prioritizing research on the socio-economic impact of AI and fostering interdisciplinary collaboration.

The majority (73%) of the survey respondents believe that multiple stakeholders need to be involved and responsible for ensuring the ethical development and deployment of AI. This is in line with the view of all experts. 11.5% of the respondents believe the government should be solely responsible and 8% believe that it should be private companies.

Developing effective AI governance frameworks in India requires a collaborative approach that involves various stakeholders. The interviewees highlight the importance of transparency, industry engagement, actionable initiatives, and a balance between innovation and responsible AI use.

Conclusion

The study unequivocally reinforces the urgent need for a comprehensive and well-structured regulatory framework for AI in India, a sentiment echoed by both AI experts and survey respondents. This framework must be carefully tailored to India's unique socio-economic and cultural context, a complex tapestry that defies direct comparison with any other nation.

The research reveals a stark reality: India's current infrastructure is not conducive to fostering AI innovation. Experts voiced their frustration over the lack of funding, limited avenues for academic research and discourse, and a tendency to view AI development solely through a technical and enterprise lens, neglecting crucial societal perspectives.

A balance between promoting innovation and implementing robust regulations is paramount. India must harness the immense potential of AI to drive economic growth and societal advancement while safeguarding against potential risks, biases, and unintended consequences. Data privacy, security, ethical considerations, and bias mitigation are identified as critical pillars that necessitate immediate and sustained attention from all stakeholders.

This uncertainty surrounding data protection and AI laws has seeped into the public consciousness, fueling fears of misuse, job displacement, and susceptibility to misinformation. Notably, entrepreneurs and AI experts advocate for prioritizing technological and infrastructural development before imposing stringent regulations, while policymakers and academics counter that regulation is essential to navigate the complexities of India's vast and diverse population, with its varying cultural norms and literacy levels.

However, the findings of this study nullify the hypothesis that AI governance would necessarily impede India's competitiveness in the AI landscape. Instead, it suggests that a well-crafted regulatory framework could foster an environment of trust and responsible innovation, potentially enhancing India's position in the global AI race.

This research serves as a potential starting point for policymakers, industry leaders, and researchers to collaboratively forge a path forward. By acknowledging the unique challenges and opportunities inherent in the Indian context and fostering a holistic approach that considers technical, economic, and societal dimensions, India can establish itself as a global leader in responsible and inclusive AI development.

Limitations

This dissertation offers valuable insights into AI regulation within the Indian landscape but operates under certain inherent limitations. While the chosen sample size provides informative data, the vast heterogeneity of the Indian AI ecosystem means that certain nuanced viewpoints and stakeholder perspectives may not be fully represented. Additionally, the qualitative approach employed, while offering a rich contextual understanding, lacks the inherent

generalizability of quantitative methodologies. Extrapolating findings to all AI contexts within India should therefore be done cautiously.

Furthermore, the study acknowledges both the temporal constraints inherent to researching a rapidly evolving field like AI and the persistent potential for researcher bias, despite efforts to mitigate its influence. This snapshot of Indian AI governance may not fully reflect the latest developments. Moreover, the absence of longitudinal data limits the ability to fully track evolving trends and assess the long-term impact of regulatory frameworks. This emphasizes the need for continuous research and analysis to comprehensively understand the dynamic landscape of AI regulation in India.

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Appendices

Appendix A: Questionnaire – AI Public Perception Survey

Questions	Answers
1. What is your age?	a) Under 18 b) 18-24 c) 25-34 d) 35-44 e) 45-54 f) 55-64 g) 65 or above
2. What is your gender?	a) Male b) Female c) Non-binary d) Prefer not to say.
3. What is your highest level of education?	a) No formal education b) Primary school c) Secondary school d) Bachelor's degree e) Master's degree f) Doctoral degree g) Other
4. What is your current employment status?	a) Employed full-time b) Employed part-time c) Self-employed d) Unemployed e) Student f) Retired g) Other
5. How would you rate your technical prowess?	a) Novice: I have limited experience with technology and often need assistance b) Beginner: I can perform basic tasks on computers and smartphones c) Intermediate: I am comfortable using various software and applications d) Advanced: I have a strong understanding of technology and can troubleshoot issues e) Expert: I have extensive knowledge of technology, including programming and hardware

6. How familiar are you with the concept of AI governance?	Likert Scale (1 – Not at all familiar, 5 – Extremely Familiar)
7. How concerned are you about the way your personal data is used and processed by AI systems?	Likert Scale (1 – Not at all concerned, 5 – Extremely concerned)
8. How concerned are you about the potential for AI systems to perpetuate or amplify societal biases and discrimination?	Likert Scale (1 – Not at all concerned, 5 – Extremely concerned)
9. How concerned are you about the transparency and explainability of AI systems' decision-making processes?	Likert Scale (1 – Not at all concerned, 5 – Extremely concerned)
10. How concerned are you about the accountability of organizations developing and deploying AI systems?	Likert Scale (1 – Not at all concerned, 5 – Extremely concerned)
11. How concerned are you about the potential misuse of AI technologies for malicious purposes, such as spreading disinformation or conducting surveillance?	Likert Scale (1 – Not at all concerned, 5 – Extremely concerned)
12. I trust the Indian government to effectively regulate AI technologies.	Likert Scale (1 – Strongly disagree, 5 – Strongly agree)
13. Do you believe that private, non-governmental bodies (such as Google, Microsoft, etc.) should be primarily responsible for setting standards and protocols for AI governance?	Likert Scale (1 – Strongly disagree, 5 – Strongly agree)
14. Are you concerned that government regulation of AI may lead to over-regulation, potentially hindering innovation and progress?	Likert Scale (1 – Not at all concerned, 5 – Extremely concerned)
15. Are you concerned that government regulation of AI may lead to under-regulation, potentially failing to adequately protect individuals and society from AI-related risks?	Likert Scale (1 – Not at all concerned, 5 – Extremely concerned)
16. Do you believe that government regulation of AI will negatively impact India's competitiveness in the global AI landscape?	Likert Scale (1 – Strongly disagree, 5 – Strongly agree)
17. How much control do you believe individuals should have over their personal data used by AI systems?	a) No control: AI systems should be able to use personal data without any restrictions b) Limited control: AI systems should be able to use personal data with some basic restrictions c) Moderate control: Individuals should have the ability to opt-out of certain data uses d) High control: Individuals should have the ability to specify exactly how their data can be used

	e) Complete control: Individuals should have the ability to prevent AI systems from using their data entirely
18. I am concerned about potential job losses due to AI automation.	Likert Scale (1 – Strongly disagree, 5 – Strongly agree)
19. How important is it for AI systems to be unbiased and non-discriminatory?	Likert Scale (1 – Not al all important, 5 – Extremely important)
20. To what extent do you agree with the following statement: "AI systems should be governed by a centralized authority with strict rules and regulations to ensure consistency and adherence to standards, even if it potentially limits flexibility and innovation."	Likert Scale (1 – Strongly disagree, 5 – Strongly agree)
21. I believe AI can contribute significantly to India's economic and social development.	Likert Scale (1 – Strongly disagree, 5 – Strongly agree)
22. How willing are you to share your personal data with AI systems if it leads to better services and experiences?	Likert Scale (1 – Not at all willing, 5 – Extremely willing)
23. In your opinion, who should be primarily responsible for ensuring the ethical development and use of AI?	a) Government: The Indian government should establish and enforce regulations b) Private companies: Companies developing and deploying AI systems should self-regulate and adhere to ethical guidelines c) Academic institutions: Universities and research organizations should set ethical standards and guide AI development d) Civil society organizations: NGOs and advocacy groups should monitor AI development and hold stakeholders accountable e) A collaboration of all the above: All stakeholders should work together to ensure the ethical development and use of AI

Appendix B: Additional Results

Concerns about AI Transparency:

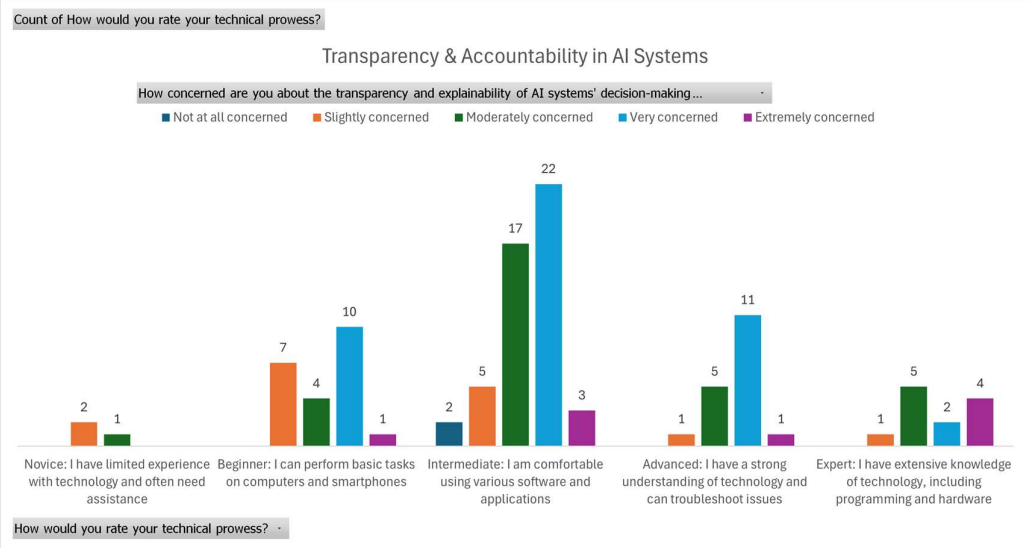

Figure 19

Overall Concern Levels:

- A significant majority of respondents (45 individuals, 43.3%) indicated that they are "Very concerned" about the transparency of AI decision-making processes.
- A smaller but still substantial proportion (19 individuals, 18.3%) reported being "Extremely concerned."
- The remaining respondents were distributed among the other categories, with a small number (2 individuals, 1.9%) indicating they were "Not at all concerned."

Concern Levels by Technical Expertise:

- **Intermediate Users**: This group displayed the highest level of concern, with 19 individuals (38.8%) "Very concerned" and 11 individuals (22.4%) "Extremely concerned."
- **Beginners**: This group also exhibited a high level of concern, with 19 individuals (38.8%) "Very concerned" and 7 individuals (14.3%) "Extremely concerned."
- **Advanced Users**: Concern remained notable in this group, with 11 individuals (22.4%) "Very concerned" and 4 individuals (8.2%) "Extremely concerned."
- **Experts**: This group showed the lowest level of concern, with only 5 individuals (33.3%) "Very concerned" and none expressing extreme concern.
- **Novices**: This group also demonstrated a relatively low level of concern, with only 2 individuals (6.7%) "Very concerned" and 1 individual (3.3%) "Extremely concerned."

Concerns About Job Losses Due to AI Automation:

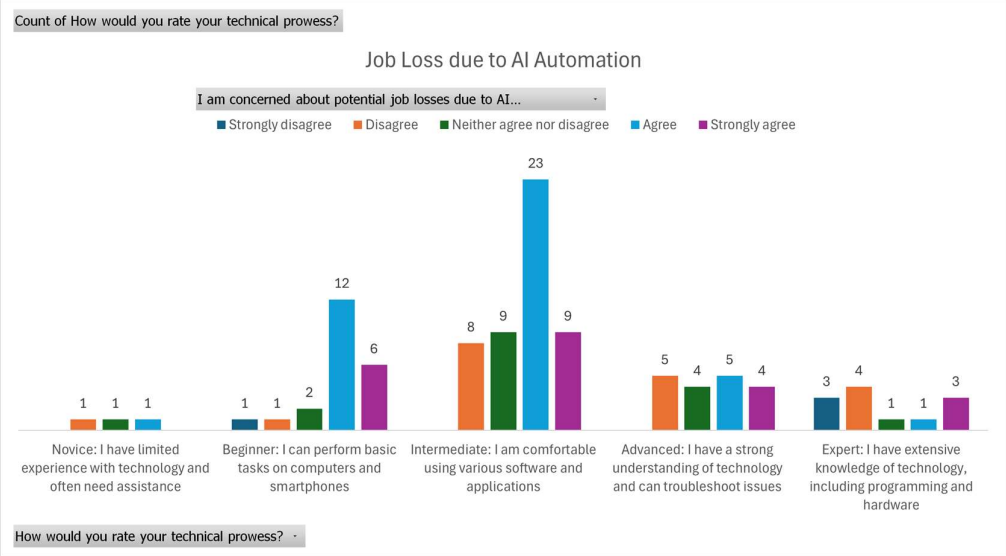

Figure 20

1. **Overall Concern Levels:**

- A significant portion of respondents (42 individuals, 40.4%) indicated they "Agree" that they are concerned about potential job losses due to AI automation.
- 22 respondents (21.2%) expressed strong agreement ("Strongly Agree").
- 19 respondents (18.3%) indicated they "Disagree."
- 17 respondents (16.3%) chose a neutral stance ("Neither Agree Nor Disagree").
- A very small portion (4 respondents, 3.8%) "Strongly Disagreed."

2. **Concern Levels by Technical Expertise:**

- **Intermediate:** This group demonstrated the highest level of concern, with 23 individuals (46.9%) agreeing with the statement.
- **Beginner:** This group also exhibited a high level of concern, with 12 individuals (54.5%) agreeing and 6 individuals (27.3%) strongly agreeing.
- **Advanced:** Saw an even distribution with 5 individuals (27.7%) from this group marking agreed, and 4 (22.2%) strongly agreed. 4 individuals took a neutral stance (22.2%) and 5 disagreed (27.7%.)
- **Expert:** This group showed varying levels of concern, with 3 individuals (25%) strongly agreeing and 4 (33.3%) disagreeing, 3 individuals (25%) strongly disagreeing.
- **Novice:** This group showed an even distribution between “Disagree.” “Neither agree nor disagree.” and “Agree” (1 each, 33.3%)

Importance of Unbiased and Non-Discriminatory AI Systems:

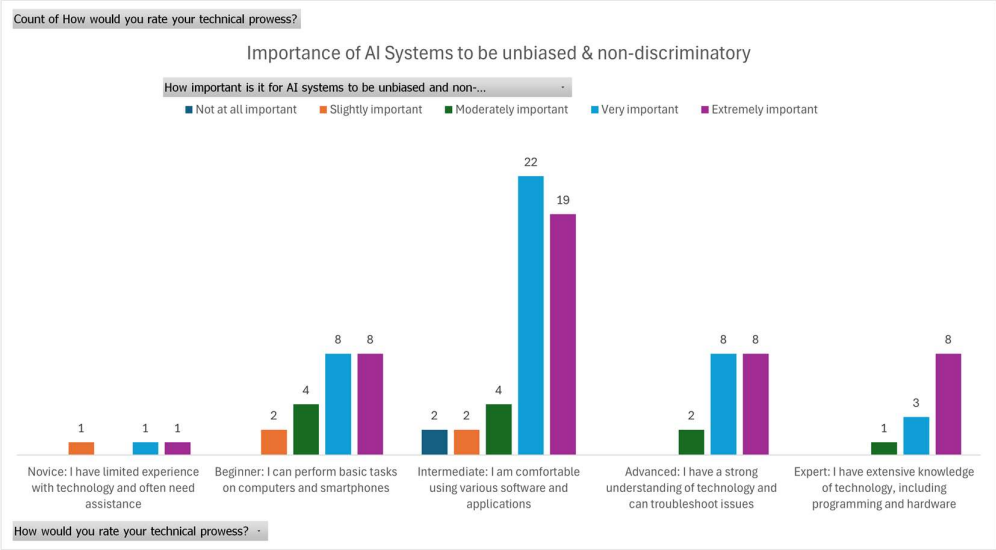

Figure 21

1.**Overall Importance:**

- Many respondents considered unbiased and non-discriminatory AI to be "Very important" (42 respondents, 40.4%) or "Extremely important" (44 respondents, 42.3%).
- Only a small fraction found it to be "Slightly important" (5 respondents, 4.8%), "Moderately important" (11 respondents, 10.6%), or "Not at all important" (2 respondents, 1.9%).

2. **Importance by Technical Expertise:**

- **Intermediate Users:** This group demonstrated the strongest emphasis on unbiased AI, with 22 individuals (45%) rating it as "Very important" and 19 individuals (38.7%) marking it as “Extremely important."
- **Beginners:** This group also showed a high level of concern, with 8 individuals (36.6%) considering it "Extremely important" and 8 individuals (36.6%) rating it as "Very important."
- **Advanced Users:** Much of this group (8 individuals, 44.4%) also found unbiased AI to be "Extremely important" and “Very important”
- **Experts:** This group had a significant number of individuals rating it "Extremely important" (8 respondents, 66.6%), and "Very important" (3 respondents, 25%).
- **Novices:** This group, despite having limited technical experience, also overwhelmingly considered unbiased AI to be "Very” and “Extremely” important (2 individuals, 66.7%).

Willingness to Share Personal Data with AI Systems:

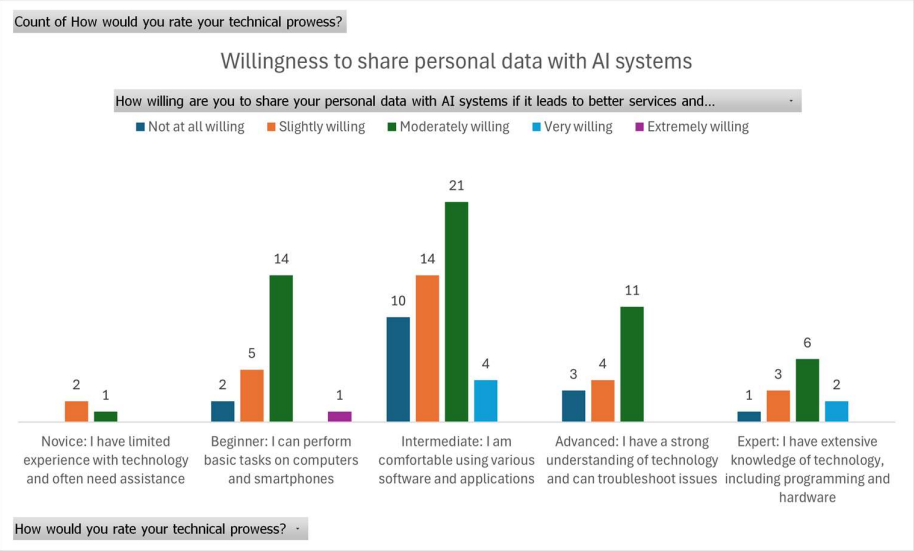

Figure 22

Overall Willingness:

- A significant portion of respondents (53 individuals, 51%) expressed being "Moderately willing" to share personal data.
- The second most common response was "Slightly willing" (28 individuals, 27%), followed by "Not at all willing" (16 individuals, 15.4%).
- A smaller proportion indicated "Very willing" (6 individuals, 5.8%) or "Extremely willing" (1 individual, 1%).

Willingness by Technical Expertise:

- **Intermediate Users:** This group demonstrated some willingness, with 21 individuals (42.9%) selecting "Moderately willing."
- **Advanced Users:** This group also showed some level of willingness, with 11 individuals (61.1%) choosing "Moderately willing."
- **Beginners:** This group had a more even distribution, with the highest number (14 individuals, 63.6%) selecting "Moderately willing." And 1 individual (4.5%) “Extremely” willing to share their data.
- **Experts:** This group was more cautious, with 6 individuals (50%) indicating "Slightly willing."
- **Novices:** This group was the least willing, with 2 individuals (66.7%) choosing "Not at all willing."

The Impact of Technical Prowess on the Belief in AI's Contribution to India's Development

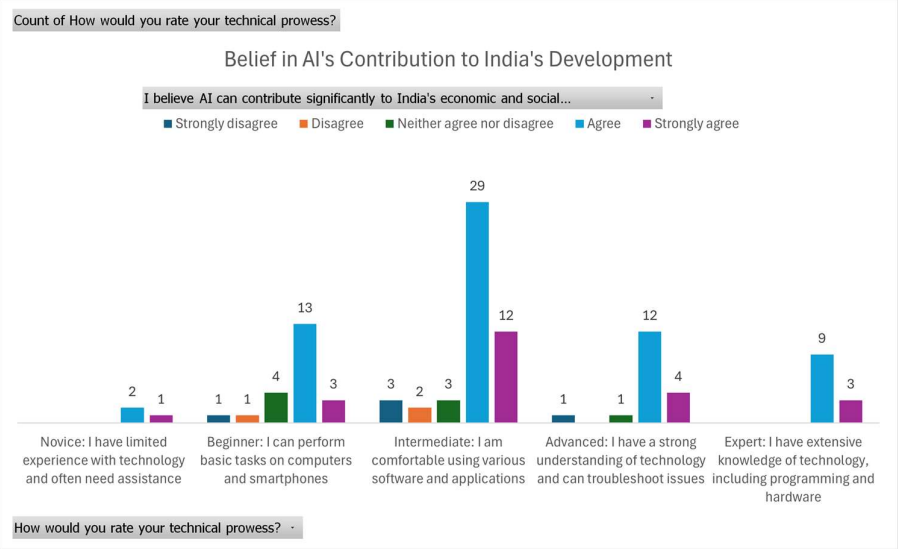

Figure 23

Overall Belief in AI's Contribution:

- Most respondents expressed a positive sentiment towards AI's potential impact, with 65 individuals (62.5%) selecting "Agree" and 23 individuals (22.1%) selecting "Strongly Agree."
- A smaller proportion of respondents indicated "Disagree" (3 individuals, 2.8%), "Strongly Disagree" (5 individuals, 4.8%), or "Neither Agree Nor Disagree" (8 individuals, 7.7%).

Belief in AI's Contribution by Technical Expertise:

- **Novice**: This group predominantly agreed with the statement, with 2 individuals (66.6%) selecting "Agree" and 1 individual (33.3%) choosing “Strongly agree.”
- **Beginner**: This group also showed strong agreement, with 13 individuals (59.1%) selecting "Agree."
- **Intermediate**: This group had the highest proportion of individuals who agreed with the statement (29 individuals, 59.2%), along with 12 individuals (24.5%) who “strongly agreed.”
- **Advanced**: In this group, the most common response was "Agree" (12 individuals, 66.6%).
- **Expert**: This group was also in agreement with all respondents selecting “agree” and strongly agree”.

Appendix C: Interview Summaries – Entrepreneurs

Interview Questions:

1. How has AI impacted your industry in India, and what future developments do you anticipate?
2. What are the main challenges you face when developing and deploying AI technologies in the Indian market?
3. In your opinion, what role should the Indian government play in regulating AI technologies to foster innovation while protecting public interests?
4. How can AI governance frameworks in India support the growth of the AI industry while mitigating potential risks?
5. What best practices have you adopted to promote responsible AI development within your organization, in line with the principles of the "Responsible AI for All" approach document?

Interviewee A – Mansoor Rahimat Khan, Beatoven.ai

In a conversation about developing ethical AI in India, Speaker 1 emphasized the need for proper regulations and compensation for rights holders, while Speaker 2 stressed the importance of ethical AI models that prioritize data privacy and consent. Speaker 2 also discussed the challenges of maintaining user data privacy while improving AI systems, acknowledging the difficulty of navigating GDPR laws while balancing user data privacy and AI system improvement. Speaker 2 shared their perspective on cultural differences in India regarding user data privacy, suggesting a middle ground between the US and EU approaches.

AI impact on music industry in India, with focus on ethical data sourcing and revenue generation.

- Speaker 2 discusses how AI has impacted the music industry, specifically in generating background music for videos, podcasts, and games.
- Speaker 2 discusses the impact of AI on the music industry, highlighting the positive and negative implications of using AI to generate music without proper compensation to composers.
- Speaker 2 identifies data as the biggest challenge in developing and deploying AI technologies in the Indian market.

AI in India, challenges, and opportunities for growth.

- Speaker 2: India lags in innovation due to late adoption, lack of foundation building.
- Speaker 2: India's education system doesn't encourage research, leading to reliance on Western models.
- Speaker 2: Indian govt should support startups with cloud infrastructure & datasets, enabling innovation while mitigating risks.
- Speaker 2: AI governance frameworks in India can help regulate technology, foster innovation, & protect public interest.

AI regulation and startup culture in India vs US.

- Speaker 1 emphasizes the need for regulation in AI, citing lack of data recognition and ethical considerations.
- Speaker 2 supports regulation, citing examples of companies exploiting data without proper compensation or consent.
- Speaker 2 compares US and India startup cultures, highlighting differences in government aid, risk-taking, and capital availability.
- Speaker 2 notes that US investors have experience building companies, while Indian investors are mostly financial and less experienced in scaling startups.

Responsible AI development and ethical considerations for businesses.

- Speaker 1 discusses responsible AI development practices with Speaker 2, including GDPR compliance and user privacy.
- Speaker 2 explains how GDPR affects AI companies, mentioning the importance of consent and transparency.
- Speaker 2 discusses the challenges of maintaining user data privacy while improving AI systems.
- Speaker 2: Indians are less aware or hesitant to accept permissions or data, while outside users are more cautious (18:35)
- Speaker 2 prefers a balance between US and EU privacy laws, allowing for innovation while ensuring ethical practices (19:49)

Interviewee B – R. Shivaraman, Big Bang Boom Solutions

AI development faces the challenge of synthetic data creation, according to Speaker 1. Speaker 2 emphasizes the importance of responsible AI development and governance in India, highlighting the need for a balance between regulation and innovation. Both speakers acknowledge the need for collaboration between industry leaders and the government to ensure ethical AI development.

AI adoption in defense fields, synthetic data challenges, and government regulation.

- Speaker 1 highlights the challenge of relying on synthetic data for AI adoption in defense fields, citing inherent data bias and potential errors in the 2D data.
- Speaker 2 seeks clarification on how synthetic data is generated, with Speaker 1 explaining the process of creating variants of the same image to train AI models.
- Speaker 1 emphasizes the importance of monitoring and evaluating AI technologies before regulating them.
- Speaker 1 suggests that industry participation and collaboration with the government is crucial for creating a comprehensive AI policy.

AI governance and regulation in India, with a focus on responsible AI development and mitigating potential risks.

- Speaker 1: AI development should have failsafe, testing, and physical kill switch to prevent misuse.
- Speaker 1: Engagement with deep tech industry is crucial for effective AI governance in India.
- Speaker 1: Data regulation necessary for startups, but difficult to monitor.

- Speaker 1: Certification process could help regulate data flow.

AI development challenges, responsible AI practices, and governance frameworks in India.

- Speaker 1: Discusses challenges in developing and deploying AI in India, including data privacy and regulation.

Interviewee C – Vatan Vindal, Shoora Technologies, Pvt. Ltd.

In India, AI governance is crucial to ensure responsible implementation of AI technologies. Speaker 1 emphasized the need for regulations to protect the public interest, while Speaker 2 highlighted the challenges and opportunities in deploying AI in the Indian market. Speaker 2 stressed the importance of regulating AI to foster innovation while protecting the public interest, citing the example of GPS becoming a mandate after 20 years of paying into the system. They also discussed the need for government incentives to encourage faster adoption of responsible AI implementation in transportation, highlighting best practices such as coaching drivers instead of punishing them. Potential risks associated with AI implementation, including driver sleepiness, were also discussed, with a focus on a human-cantered approach to AI development.

AI governance in India, challenges in developing and deploying AI technologies.

- Speaker 1 discusses AI governance in India, comparing it to EU, US, China, and UK.
- Speaker 2 discusses the challenges of driving in India and the need for a solution to address these issues.
- AI-powered camera system with edge computing and human interface developed to improve driving behavior.
- Speaker 2 highlights challenges in developing and deploying AI technologies in India due to lack of local hardware and software manufacturers.

AI in transportation, safety, and regulation.

- Speaker 2 explains how the Indian transport industry operates on thin margins, making it difficult for transporters to absorb additional costs like camera surveillance.
- Speaker 2's company is working with Amazon vendors to provide camera solutions for commercial vehicles, with the goal of changing the perception of the device from monitoring to safety and security tool.
- Speaker 2 explains how a camera can be a helpful tool for identifying issues in one's home.
- Speaker 2 suggests India's government should prioritize road infrastructure upgrades to reduce accidents and fast-track AI implementation.

AI governance, safety, and education in the transportation industry.

- Speaker 2 suggests rewards from government policies could encourage faster adoption of AI technology in the transportation industry.
- Best practices adopted by the speaker's organization include ensuring driver alertness and implementing keypad habits to prevent driver fatigue.
- Speaker 2 discusses the importance of driver safety and literacy, mentioning their company's initiative to provide free publicity.

Interviewee D

This interview provides insights into AI governance in India from the perspective of the CEO of a company providing AI solutions to financial services and logistics sectors. She discusses the impact of AI on these industries, the challenges faced in developing and deploying AI in the Indian market, and the role of government and other stakeholders in promoting responsible AI development.

Impact of AI on Industries in India:

Financial Services: AI is being increasingly explored for efficiency, productivity, and new revenue generation. There's a shift from risk aversion to a proactive embrace of AI technologies.
Logistics: Companies are using AI for aggregation, predictive modeling, and leveraging historical data to pre-empt work, thereby reducing reliance on third-party vendors.

Challenges of AI Development in India:

Unrealistic Expectations: Media hype around AI creates unrealistic expectations among clients, leading to analysis paralysis and delayed decision-making.
Data Availability and Quality: India lacks the culture of open source data sharing prevalent in other countries. There's also a need for better data protection mechanisms.
Compute Systems: Limited availability and high cost of compute systems pose a challenge for AI development and deployment.
Talent and Innovation Ecosystem: India's R&D labs and talent pool are limited compared to other countries. Funding for innovative AI projects is also lacking.

Role of Government in AI Governance:

Framework Development: The government should develop industry-specific AI implementation frameworks that address ethical considerations and data utilization.
Data Protection Act: Implementing a robust data protection act is crucial to safeguard consumer data and build trust in AI technologies.
Public-Private Partnerships: Collaboration between the government, private companies, and academic institutions is essential to educate the public about AI, promote responsible AI development, and build a sustainable AI ecosystem.

Responsible AI Development at Intellect AI:

Transparency: Prioritizes transparency by providing clients full access to the decision-making processes of AI models, data logs, and model parameters.
Data Security: Ensures data security through trust and data orchestration layers, and provides clients access to data logs for verification.

Ethical Considerations: Aims to transform AI from a black box to a light box, building trust and promoting responsible AI development.

Appendix D: Interview Summaries – Consultants

Interview Questions - International Consultant

1. Key factors driving countries to prioritize stringent regulations or innovation in AI governance.
2. Benefits and drawbacks of centralized and decentralized AI regulation
3. The role of ethics in shaping AI governance policies and balancing innovation with responsibility

Interviewee E

India lacks laws and regulations for AI governance, highlighting the need for responsible innovation. Stan and Julia emphasized the importance of balancing innovation with ethical considerations, while Julia stressed the need to address potential risks and impacts. All agreed that AI can democratize the digital economy and improve lives, but ethical concerns must be addressed to ensure responsible innovation.

AI governance and regulation in different countries, with a focus on ethics and innovation.

- Speaker 2 discusses key factors driving countries to prioritize AI governance regulations or innovation, citing EU barriers as an example.
- Speaker 2 notes that US/UK approach to AI governance may hinder public perception/trust due to information gap.
- Speaker 2 argues that general public is not aware of laws/regulations in different countries, leading to expectations of AI ethics being taken.
- Speaker 2: Companies should take lead on AI regulation, with government oversight.
- Speaker 2: Consumers should have a say in regulation through informed choices.

AI ethics and governance

- UNESCO's ethics wing sets standards for AI governance, balancing innovation with responsibility.
- Speaker 2 emphasizes the importance of ethics in AI governance, citing Google's Gemini as an example of unintended consequences.
- Julia from Accenture discusses AI's potential to democratize the digital economy through language translation.
-

Interview Questions – Policy & Responsible AI Consultant:

1. In your experience, what are the key factors that drive countries to prioritize either strict regulations or innovation-friendly policies in their approach to AI governance?

2. How do you assess the potential benefits and drawbacks of centralized versus decentralized AI governance models and which approach do you think is more suitable for a country like India, given its unique socio-economic and political context?

3. What role do you think ethical considerations should play in shaping AI governance policies, and how can policy makers effectively balance the need for innovation with the responsibility to protect individual rights and societal values?

4. In your opinion, what are the most critical elements of a comprehensive and effective AI governance framework, and how can these be tailored to the specific needs and challenges of different countries or regions?

5. How can policy makers and consultants specializing in responsible AI effectively engage with various stakeholders, such as industry, academia, civil society, and the public, to ensure a participatory and inclusive approach to AI governance?

6. Based on your expertise, what are some of the best practices or success stories in AI governance from around the world that India can learn from, and how can these be adapted to the Indian context to promote responsible AI development and deployment?

Interviewee F

The conversation cantered around the importance of developing comprehensive and effective AI governance frameworks in India. Speaker 1 advocated for a more fair and less regulatory approach, while Speaker 2 highlighted the need for India to catch up with other countries in terms of AI adoption and deployment. Both speakers acknowledged the challenges India faces and suggested that entrepreneurs should be encouraged to design new products and deploy new technologies while being mindful of legal systems and responsible AI practices. The need for stronger data privacy regulations was also discussed, with Speaker 1 advocating for a more pro-innovation stance and Speaker 2 emphasizing the need for a middle ground approach.

AI development and governance in different countries, with a focus on Europe, US, China, and India.

- Speaker 1: Rich countries like US, Europe, and China prioritize AI development, while others focus on catching up.
- Speaker 1: EU and UK struggle to grow due to lack of innovation and focus on harmful AI applications.
- Speakers discuss AI governance approaches in different countries, with a focus on India's potential approach.

AI governance models, regulations, and their impact on innovation and consumer protection.

- Speaker 1: Centralized regulations slow down startups, while decentralized model is more suitable for India

- Speaker 2: Decentralized model is preferred for India, but legal system is slow, causing harm to consumers
- Speaker 1: Centralized AI governance could help countries like India detect misuse and inform users
- Speaker 1: Government needs to develop institutional capacity to understand AI's future

AI ethics, bias, and liability.

- Speaker 1 highlights the importance of subject matter experts in AI development, citing the example of the atomic bomb.
- Speaker expresses concerns about AI systems' lack of empathy and ethical considerations.

AI ethics, legal personality, and liability.

- Speaker 1 emphasizes the importance of human involvement in AI decision-making, citing the need for a human interface in various applications.
- Speaker 2 queries the role of ethical considerations in shaping AI governance policies, seeking a balance between innovation and individual rights protection.
- Speaker 2 argues that AI should be given legal personality to be held accountable for its actions.
- Speaker 2 suggests using existing laws and a robust justice system to address responsible AI concerns.

AI governance, data privacy, and ethics in India.

- Speaker 2: European approach to AI governance focuses on robust data regulations (GDPR) to minimize biases in AI models.
- Speaker 1: Indian perspective on AI governance prioritizes existing legal system and data availability for entrepreneurs.
- Speaker 1: Government should publish open data, allow data exchanges.
- Speaker 2: Lack of knowledge/awareness about data usage, misuse in India.
- Speaker 1 emphasizes the importance of understanding the implications of sharing information online and the potential consequences of doing so.
- Speaker 1 suggests that India can learn from the US and EU in terms of AI development and deployment, while also emphasizing the need for responsible regulations.

Data regulation in India with entrepreneurs and companies.

- Speaker 2 wants to keep the interview strictly within the Indian context, only speaking to Indian companies.
- Speaker 2 has difficulty getting in touch with people for quotes, with some being forthcoming and others not.
- Speaker 2 discusses challenges with scheduling interviews for entrepreneurs and big companies in India, with a focus on finding a middle ground between regulation and innovation.

Appendix E: Interview Summaries – Policy Experts

Interview Questions

1. How does the Indian government currently approach AI governance, and what are the key objectives and priorities of the national AI strategy, as outlined in NITI Aayog's "Responsible AI for All" approach document?

2. What are the main challenges and opportunities for India in developing and implementing effective AI governance frameworks, considering the country's diverse socio-economic landscape and the need to balance innovation with ethics and social responsibility?

3. How does the Indian government plan to ensure that AI development and deployment in the country aligns with the fundamental rights and values enshrined in the Indian Constitution, such as equality, privacy, and non-discrimination?

4. What role do you think policy makers should play in fostering multi-stakeholder collaboration between government, industry, academia, and civil society to ensure a comprehensive and inclusive approach to AI governance in India?

5. What lessons can India learn from the AI governance approaches taken by the EU, USA, UK, and China, and how can these be adapted to the Indian context, considering the country's unique challenges and opportunities?

6. As a policy expert, what do you think are the most critical policy interventions or reforms needed to create an enabling environment for responsible AI development and governance in India, and what are the key milestones and timelines for achieving these objectives?

Interviewee G

India is working on a framework for AI regulation, but concerns about data privacy and collection persist. Speaker 1 emphasizes the government's principle-based legislation approach, while Speaker 2 questions whether the government truly cares about privacy concerns. Both agree on the need for regulations to ensure responsible AI development and governance, while remaining competitive on the global stage. Speaker 1 highlights the importance of a cross-ministerial committee to address ethical concerns, while Speaker 2 stresses the role of multi-stakeholder collaboration in balancing ethics and innovation. The need for critical policy interventions and reforms to create an enabling environment for Responsible AI development and governance in India is also discussed.

AI regulation in India, focusing on three key legislations.

- Speaker 1 explains how the Indian government's approach to AI regulation is holistic and interconnected with other legislations.
- Government aims to regulate AI and data privacy through principle-based legislation.
- The government is developing a principle-based legislation on AI, with different rules for different companies.
- The National Data Governance Policy or framework may mention AI, and other legislations may also feature AI in different capacities.

AI governance and privacy laws in India.

- Speaker 2 questions the government's approach to data privacy laws in India.
- Speaker 1: Indian govt's approach to AI governance is ex ante regulation, prioritizing data protection over individual autonomy.
- Speaker 2: Government's thought process is to protect data, not consider individual privacy concerns, as seen in GDPR vs. Indian AI act.

Regulating AI in India, with a focus on existing laws and fostering responsible innovation.

- Speaker 1 suggests looking to existing laws for AI governance frameworks in India due to the long process of creating new legislation.
- Speaker 1: India regulating crypto under existing laws, not a straightaway yes or no response.
- Speaker 2: How can India manage regulation and innovation in AI sector while remaining competitive?

AI governance in India, including policy reforms and stakeholder engagement.

- India aims to form a cross-ministerial committee to leverage DPI for AI governance.
- The government's approach to legislation has changed, with less consideration given to stakeholder feedback.
- Industry pushback on recent legislation, such as the Digital Competition Bill, has not been fully reflected in the final version.
- Speaker 1: Integration of emerging tech with legacy systems crucial for Responsible AI development in India.
- Speaker 2: Anonymity preferred for dissertation guidelines to protect identity.

Interviewee H

In the conversation, Speaker 1 and Speaker 2 discussed the Indian government's approach to AI governance and the key objectives and priorities of the national AI strategy. They emphasized the importance of clarity in AI governance, particularly in allocating roles and responsibilities among regulators. Speaker 2 highlighted India's sectoral approach to AI governance, focusing on specific harms like deep fakes, while Speaker 3 emphasized the need for a comprehensive and inclusive approach involving multi-stakeholder collaboration and evidence-based policymaking. The speakers also discussed the challenges and opportunities for India in developing effective AI governance frameworks, balancing innovation with ethical concerns and ensuring fairness in contracts.

AI governance in India and Europe, with a focus on ethics and regulation.

- Speakers discuss ethical considerations in AI governance for India, comparing it to Europe and the US.
- Speaker 2 seeks to remain anonymous in interviews, while Speaker 1 prioritizes honesty and accuracy.

AI governance in India, with a focus on sectoral regulations and harm-based approaches.

- Indian government's approach to AI governance is evolving, with a focus on applications rather than a comprehensive framework.
- Indian government considering changes to regulations on AI after backlash over recent advisory.
- Expect sectoral approaches to AI regulation, focusing on harms rather than systems, and balancing beneficial use cases with misuses.

AI governance in India, balancing innovation and ethics.

- Existing laws may be sufficient for regulating AI in India, but gaps and new specific regulations may be needed.
- Scholar Anu Bradford argues regulations can enable innovation by creating legal certainty.

AI regulation in India, focusing on diversity and multi-stakeholder collaboration.

- Speaker 2 discusses the importance of regulation in the AI marketplace, citing the need for guardrails to ensure a stable marketplace (14 words)
- Telangana government's AI procurement guide is inspired by similar directives in Canada, aiming to create safeguards in the procurement process (15 words)
- Speaker 2 argues that AI regulation should address larger concerns with the legal system, such as discrimination and inequality.
- Speaker 2 suggests that an anti-discrimination law in India could help address algorithmic bias and long-standing problems of discrimination.
- Speaker 2: AI governance in India needs multi-stakeholder collaboration, evidence-based policymaking.
- Speaker 2: Policymakers in India should build India-specific evidence on AI harms, use in policymaking.

India's unique approach to AI regulation, focusing on government-led data center development and DPI approach.

- Speaker 2 highlights the importance of understanding India-specific context in policymaking for AI.
- Government of India and private partnerships are driving technology development in India.
- Speaker 2: India should consolidate capital from multiple places to build large data centers and GPU capabilities.
- Speaker 1: US approach to regulation, focused on consent and stringent laws, could work for India's data use and healthcare.

Creating an enabling environment for Responsible AI development and governance in India, including establishing an AI Safety Institute

- Speaker 2 suggests clarifying roles and responsibilities for AI governance in India.
- Speaker 2 proposes establishing a central platform for experts to collaborate on AI issues, such as a single center that can be pointed to for questions and concerns, like the AICPA Institute in the UK.
- Speaker 2 highlights the importance of effective data protection law, particularly in AI governance.
- Challenge lies in balancing free reuse of publicly available information with creators' rights and individuals' privacy.

AI governance in India, risk-based regulation, and the need for a body of evidence.

- Speaker 2 suggests developing a body of evidence to reflect Indian context of risk in AI governance.
- Speaker 2 questions the effectiveness of current risk-based regulation in India, citing lack of laws for low-risk situations.

AI governance in India, concerns about lack of transparency and expertise in policymaking.

- Speaker 2 expresses concern about the focus on AI governance in India, suggesting that other issues like unemployment are more pressing.
- Speaker 2 and Speaker 1 discuss the potential problems with using indexes to measure the state of democracy in India.
- Speaker 2: AI discussions in India often lack nuance, with few understanding KNN algorithm's potential.
- Speaker 2: Lack of transparency in policymaking hinders accountability and explanation.
- Speaker 2: AI can help bridge transparency gap in policymaking, but more research is needed.

Interviewee I

India faces challenges in developing effective AI governance frameworks, with speakers advocating for a niche approach that balances regulatory frameworks from Europe and the US. Both speakers emphasized the need for responsible AI development and deployment, with stricter regulations on data privacy and the importance of balancing consumer privacy with innovation and competition in the tech industry. The conversation also touched on the challenges of managing biases in data collection and analysis, with a focus on voluntary self-adoption by companies.

AI governance in India, comparing EU, US, China, and UK models.

- Speaker 2: Advocating for a balance between rights-based and market-liberal approaches in India.

- Speaker 2 suggests India should prioritize AI and web3 sectors for regulation, taking a step-by-step approach.
- Speaker 2 recommends a risk-based approach to regulation, with high-risk AI applications strictly regulated.

Data privacy and protection in India, with a focus on government regulations and consumer awareness.

- Entrepreneur notes strict data privacy regulations in India, with Reddit discussions emerging from privacy policy changes.
- Speaker 2 argues that tech companies must make changes to protect consumer data, even if consumers don't care.
- Speaker 1 asks about the role of governments in making laws stricter, like GDPR or India's stance on data privacy.

AI governance challenges in India, including disconnect between stakeholders and lack of capacity building.

- Speaker 2 highlights challenges in defining data protection laws, need for clarity (12 words)
- Speaker 2 discusses opportunities for India in developing effective AI governance frameworks, balancing innovation with ethics (14 words)
- Speaker 2 highlights a disconnect between AI governance stakeholders and designers in India, leading to a lack of cohesion in AI discussions.
- Speaker 2 believes there's a need for capacity building and skill development in Gen AI models and tools in India to enable the country to leap forward in the field.

Responsible AI development and governance in India, including policy interventions and stakeholder engagement.

- Speaker 2 suggests a principle-driven approach to regulating AI deployment in India, avoiding over-regulation.
- Speaker 2 emphasizes the importance of multi-stakeholder collaboration in policy-making.
- Expert suggests responsible AI requires bias mitigation, questioning advertisers, and a nuanced approach.

Bias mitigation in AI development.

- Speaker 2 emphasizes the importance of bias mitigation in AI development, suggesting that responsible AI tools and regulations are crucial.
- Speaker 1 queries the feasibility of completely mitigating bias, given the diversity of perspectives and the complexity of global data regulations.
- Speaker 2 discusses the challenges of managing biases in AI development, emphasizing the need for voluntary self-adoption of responsible practices.

Appendix F: Interview Summaries – AI Experts

1. What are the most significant advancements in AI technology in India, and what implications do they have for governance?
2. In your opinion, what are the main ethical and societal challenges associated with AI development and deployment in the Indian context?
3. How can AI systems be designed to align with Indian values and mitigate potential risks, considering the country's diverse cultural and socio-economic landscape?
4. How can AI governance frameworks in India address issues of transparency, accountability, and fairness in AI systems, considering the country's unique challenges?
5. What research areas do you believe are critical for informing the development of an effective AI governance framework in India, as envisioned in the "Responsible AI for All" approach document?

Interviewee J

Interview on AI Governance

Implementing AI governance in India is complex due to regulatory challenges, limited public understanding, and the need for a gradual and collaborative approach. Ethical and societal challenges must be addressed, including transparency, accountability, and fairness in AI systems. Data privacy is a concern in India, particularly among younger generations, and there is a lack of government regulations and oversight. Social media data can be valuable for regulatory purposes, but there are also concerns about data privacy and the potential for misuse.

AI advancements in India, particularly in IT and defense sectors.

- Speaker 1 discusses advancements in AI technology in India, particularly in the IT sector.
- Speaker 2 highlights the potential impact of these advancements on governance, citing call centers and delivery resources as examples.
- Speaker 2 highlights the growth of AI in India, particularly in the IT sector, defense, and healthcare.
- Speaker 2 notes that while AI adoption is easier in India due to less human population and existing autonomic systems, people's understanding of AI is a challenge.

Data privacy and AI adoption in India, with a lack of understanding among younger generations.

- Speaker 2 notes change in innovation, with defense systems and automated missiles, and resources provided to them.
- Speaker 2 sees increased recognition and appreciation for new technologies and their development, with companies and other institutes voicing their support.
- Speaker 2 notes lack of understanding of data privacy among younger generations, citing examples of college data sharing and lack of awareness about data usage.
- Speaker 2 suggests generational change may be necessary to address data privacy concerns, as older generations may not fully comprehend the issue.

Government's role in AI development and its impact on society.

- Speaker 2 discusses the challenges of implementing new policies in India, citing Aadhaar linking and GST as examples.
- Speaker 2 highlights the importance of public awareness and support for government initiatives, citing the example of voting and GST compliance.
- Speaker 2 suggests that citizens should also upgrade themselves to keep up with AI technology.
- Speaker 2 believes that private companies entering the scene can lead to two systems of governance, with potential biases and limitations.

AI adoption in India, job losses, and ethical considerations.

- Speaker 2 emphasizes AI's potential beyond job loss, citing its use in various industries like agriculture, medicine, and supply chain management.
- Speaker 2 observes that people in India are more relational and people-oriented in their approach to sales, while in Europe and the US, there is a focus on presentation and appearance.
- Speaker 1 suggests that the fear of education and laziness may be factors in why some people are slow to adapt to new technologies, while Speaker 2 adds that there may be a lack of understanding of the benefits of technology as well.

AI adoption in India, challenges with transparency and accountability.

- Speaker 2: Lack of effort and laziness hinder adoption of AI in India.
- Speaker 2: Fast Track example shows how AI can make lives easier, with automation and data collection.
- Speaker 2 suggests implementing AI governance frameworks in India, taking into account the country's unique challenges and thought processes.
- Speaker 2 emphasizes the importance of manual checks and audits to ensure transparency, accountability, and fairness in AI systems.

AI governance in India, focusing on data privacy and security.

- Speaker 2 discusses the importance of data points for renewable energy sources, mentioning the need for a second layer to streamline data collection and ensure government interference.
- Speaker 2 highlights the challenges of implementing data collection in different domains, including telecommunications, and the need for a second organization to audit data collection.
- Speaker 2 highlights the importance of food technology in AI governance in India.

Using AI to monitor consumer goods for health impacts.

- Speaker 2 highlights concerns about fast-moving consumer goods, lack of regulation, and misinformation.
- Speakers discuss potential for AI to track individuals' health data and provide personalized recommendations.

- Speaker 2 highlights social media data points for regulatory checks and product development.

Interviewee K

Advancements in AI Technology in India:

The most significant advancement in AI in India is the development of large language models (LLMs) that work on Indic languages. This is a major breakthrough considering the contextual nature of these languages.

Implications for Governance:

This advancement poses several challenges for governance:

Misinformation: LLMs can be easily misused to create and spread misinformation, requiring enhanced monitoring and regulation.

Access and Control: There's a need to regulate access to model weights and monitor their usage to prevent malicious actors from exploiting them.

Enforcement and Accountability: While both government and enterprises have a role to play in ensuring responsible AI use, the government is ultimately responsible for enforcement and holding enterprises accountable.

Data Protection and Privacy: Educating the public about data protection and privacy is crucial, but it's challenging due to India's diverse population and varying levels of technological literacy. A dedicated campaign highlighting the ill effects of bad data management could be effective.

Ethical and Societal Challenges:

Misinformation: The rapid creation and spread of misinformation through LLMs is a major concern.

Unified Framework: The lack of a tangible, unified framework for AI governance makes it difficult to address ethical issues and ensure responsible AI use.

Unemployment: AI advancements like content generation tools may lead to job displacement, especially in sectors like content writing, which are significant sources of employment in India. The government needs to be prepared to handle such socio-economic impacts.

Aligning AI Systems with Indian Values:

The interviewee argues that technology doesn't need to be aligned with cultural nuances. The focus should be on making AI fair, free, open, and secure, and preventing its misuse.

AI Governance Framework in India:

Transparency, Accountability, and Fairness: GDPR serves as a potential model, but India needs a unique framework that considers its diverse cultural and socio-economic landscape.

Trickle-down Policy Making: A centralized framework by the central government, adaptable by state governments, could be effective.

Collaboration: The government needs to collaborate with experts from industry, academia, and social sciences to develop effective AI governance policies.

Critical Research Areas:

Socio-Economic Impact: Research is needed to understand the socio-economic impact of AI systems on end consumers, creators, and vendors.

Responsible and Secure AI: Research should focus on developing secure AI systems that are inherently protected from malicious use, along with responsible AI practices.

Model Convergence: Investigating whether AI models will converge in their outputs due to limited and similar training data is crucial.

Appendix G: Interview Summaries – Academic

Interview Questions

1. How do you assess the current state of AI governance in India, considering the country's unique socio-economic, cultural, and political context?

2. In your opinion, what are the key ethical, legal, and societal challenges that India faces in developing and implementing effective AI governance frameworks?

3. How can India balance the need for AI innovation and economic growth with the protection of individual rights, privacy, and societal values, as outlined in the Indian Constitution? – q2

4. What lessons can India learn from the AI governance approaches taken by the EU, USA, UK, and China, and how can these be adapted to the Indian context, considering the country's distinct challenges and opportunities?

5. How can collaboration between academia, industry, government, and civil society in India be fostered to ensure a multi-stakeholder approach to AI governance, as envisioned in NITI Aayog's "Responsible AI for All" approach document?

6. As an academic, what do you think are the most important research areas or questions that need to be addressed to support the development of effective AI governance frameworks in India?

Interviewee M

Research Needs:

1. Explainable/Transparent AI: More research is needed on making AI systems understandable and transparent.

2. Economic Impact of AI: Research is lacking on the economic impact of AI, such as job losses due to automation.

3. Interdisciplinary Collaboration: More collaboration is needed between social scientists and AI scientists to understand the broader societal impact of AI.

Collaboration Challenges:

1. Conflicting Interests: Collaboration between academia, government, civil society, and industry is challenging due to their different interests and incentives.

2. Balancing Collaboration and Competition: While collaboration is necessary, it's important to avoid collusion and protect citizens' rights from being compromised for business interests.

Specific Recommendations for India:

1. Prioritize Research: Focus on research to understand the impact of AI on employment and society.

2. Foster Interdisciplinary Collaboration: Encourage collaboration between different fields to address the broader implications of AI.

3. Balance Stakeholder Interests: Ensure that AI governance policies protect citizen rights while also fostering innovation and economic growth.