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Unlocking AI Transparency:
The Access Methodology Framework for Classifying AI System Openness

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I. Introduction

Artificial Intelligence (AI) holds the potential to revolutionize industries and enhance daily life. Its benefits include improved efficiency, accuracy, and scalability in tasks ranging from medical diagnostics to natural language processing. For instance, AI-driven systems can rapidly analyze vast datasets, identifying patterns and insights that would be beyond human capacity. This capability has led to breakthroughs in drug discovery, personalized marketing, and autonomous transportation. However, these advancements come with significant risks. AI Systems[2] can perpetuate or even amplify biases present in training data, leading to unfair or discriminatory outcomes. Additionally, the misuse of AI in areas such as surveillance, autonomous weapons, and disinformation campaigns raises ethical and societal concerns.

AI technology is developing at an unprecedented pace, significantly outpacing the evolution of other emerging technologies such as blockchain, quantum computing, or renewable energy. Advances in computational power, the availability of massive datasets, and improved algorithms have fueled this rapid growth. Technologies that took decades to mature, such as the internet, have been surpassed in developmental speed by AI Systems, with major advancements occurring within years. For instance, the leap from GPT-3 to GPT-4 demonstrated exponential improvement in language understanding and generation in under three years.[i] This swift evolution presents opportunities but also challenges as the regulatory and ethical frameworks struggle to keep pace with technological advancements.

One of the greatest challenges in AI development is the difficulty even experts face in fully understanding how AI Systems work and make decisions. For example, some AI Systems were prompted in one language, i.e., English, and output an answer in the same language but the intermediate steps were carried out in a different language, i.e., Chinese. No one could explain with certainty why this happened.[ii] This phenomenon stems from the complexity of modern AI architectures, particularly deep learning models.[iii] These models consist of billions of interconnected parameters optimized through training on massive datasets. While developers can track overall system performance and pinpoint outcomes, deciphering the precise pathways or "reasoning" behind individual decisions remains elusive. This opacity is compounded by emergent behaviors—unexpected capabilities that arise when models reach a certain scale, as observed with large language models like GPT.[iv] The difficulty in interpreting these systems

[1] The author gratefully acknowledges financial support from 4iP Council. The author would also like to express her appreciation to Alkema Woods who provided indispensable reference checking assistance, as well as to several experts for their invaluable feedback. The views expressed in the paper are solely those of the author and do not represent the views of any of those who assisted with the paper or provided feedback.
[2] The definition of "***AI System***" used in this paper will be the one adopted in the OECD Principles: "*AI system*: An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment." *What is AI? Can you make a clear distinction between AI and non-AI systems?*, (Mar. 6, 2024), https://oecd.ai/en/wonk/definition.

underscores the importance of investing in explainable AI and ensuring transparency to build trust and accountability in AI applications.

The regulatory landscape for AI Systems is rapidly expanding, with an increasing number of national and regional rules aimed at ensuring safety, fairness, and accountability. However, the absence of a unified global AI governance framework makes compliance testing inconsistent. In this governance vacuum, transparency has emerged as a fallback solution, with growing calls for AI Systems to be open-sourced.[v] By making AI Systems and their development processes publicly accessible, proponents argue it becomes easier to scrutinize, audit, and verify compliance with various regulations and standards, fostering trust and accountability in AI deployment.

Requirements for open source AI Systems compel AI System developers to grant far more rights than needed for transparency, for example, to authorize competitors to freely utilize the AI System components in competing AI Systems. Requirements to grant such broad license rights may harm business model competition and impede innovation, especially for small entities such as startups. Importantly, requirements to make the AI System model weights publicly available, often associated with certain "open source" definitions, could allow bad actors the access they need to pursue nefarious acts. This paper introduces a classification framework for AI System openness that is specifically designed to address these concerns. The proposed framework: (i) applies only in situations where access to particular AI System components is necessary, (ii) ensures that access and evaluation are limited to stakeholders with a legitimate need to know, and (iii) incorporates licenses that may limit access and use of AI System components solely for the purpose of understanding how the system functions and makes decisions.

II. State of AI Governance and Challenges

a. Patchwork of regulations affecting global markets

The landscape of AI regulation is diverse and complex, reflecting the varying priorities and concerns of different countries and regions. Europe is leading the way in AI regulation with a comprehensive approach that combines regional and national initiatives, focusing on ethics, safety, and accountability. Within the US, there are a myriad of different regulations and trends. AI regulation in the US is developing through a combination of federal proposals, state-specific laws, and industry-led initiatives, as there is no comprehensive national framework yet.[vi]

Outside of Europe and the United States, the approach to AI regulation varies widely, reflecting differing national priorities, levels of technological development, and socio-political contexts. While some countries are adopting stringent regulatory frameworks, others are focused on promoting innovation with minimal regulation or relying on existing legal structures. For example, China has introduced stringent regulations focused on national security, with rules that mandate government access to AI data and strict content moderation.[3] These conflicting approaches create challenges for global companies seeking to comply with AI regulations, as

[3] The Cyberspace Administration of China (CAC) introduced rules that mandate transparency in AI algorithms, particularly those used in content recommendation and social media platforms. These regulations require companies to disclose their algorithms to the government and ensure they do not spread harmful content or misinformation. Algorithmic Transparency Regulations (2022)

they must navigate differing legal frameworks that prioritize issues like privacy, innovation, security, and human rights in distinct ways.

b. Key regulations in the US

The United States has adopted a decentralized, sector-specific approach to AI governance, prioritizing innovation and relying on industry-led standards rather than comprehensive federal legislation. To illustrate the complexity and diversity of AI initiatives across the country, several federal, state, and industry examples are discussed. It's important to note that the range of initiatives at all levels—federal, state, local, and within voluntary industry efforts—continues to expand and evolve.

Some key AI initiatives at the Federal level include: the Blueprint for an AI Bill of Rights, the National Institute of Standards and Technology (NIST) AI Risk Management Framework, the proposed Algorithmic Accountability Act, and various Executive Orders.[vii] The Blueprint for an AI Bill of Rights is an initiative by the White House Office of Science and Technology Policy that outlines five key principles to guide AI development, including protections against algorithmic bias, the right to explanation and transparency, data privacy safeguards, and ensuring AI systems do not harm individuals. The NIST AI Risk Management Framework is a voluntary guide for companies to manage risks associated with AI, with an emphasis on trustworthiness, fairness, and transparency in AI systems. The proposed Algorithmic Accountability Act would, if approved in its current form, require companies using AI systems to conduct impact assessments to evaluate potential risks, such as biases or privacy violations, particularly in high-risk applications like hiring, credit scoring, and policing. Recent executive orders, such as the Executive Order on Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence, focus on advancing AI research and development while promoting ethical standards and addressing concerns related to national security, privacy, and civil rights.[viii] While this Executive Order was very recently rescinded by the new administration, several aspects of it have been implemented as discussed below. The new U.S. administration has also signaled a desire to support AI standards[4] over regulation.[ix]

While federal initiatives focus on voluntary frameworks and ethical guidelines, the U.S. regulatory landscape for AI is fragmented with different states taking varied approaches. A number of US States have been active in AI governance initiatives including California, Illinois, and Colorado. For example, in California over a dozen AI bills have been signed into law. One of California's most significant laws mandates that AI System producers generally reveal the sources of their data, explain how the data is used, indicate the number of data points, disclose whether copyrighted or licensed data is included, and clarify the time period during which the data was collected.[x] This increased transparency is designed to provide more accountability for AI systems, particularly those that rely on large-scale data for training. In addition to addressing transparency in data, the California laws address risk management, risks to health care, education and privacy, watermarking requirements, deepfakes, and many other important risks associated with the use of AI.

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[4] The Biden administration formed the Artificial Intelligence Safety Institute Consortium (AISIC) housed under the NIST. Although AISIC participants include private corporations, individuals, academics and other non-government entities, it is federally funded. In recent days the new Trump administration has endeavored to halt federal funding. Despite Secretary Lutnick's support for NIST and AI standards at his recent confirmation hearing, it is unclear how or if the funding issue will impact AISIC.

There are also local initiatives in the US such as New York City's Local Law 144.[xi] This law mandates bias audits for automated employment decision tools, requiring companies to assess and mitigate discrimination in AI-powered hiring systems. It is one of the first city-level regulations targeting AI in the workplace.

c. Key Regulations in Europe

In Europe, the European Union is at the forefront with its AI Act, aiming to set strict standards based on the potential risks of AI applications, particularly focusing on transparency and accountability. Europe's comprehensive approach combines regional and national initiatives, focusing on ethics, safety, and accountability. Although the number of proposals and regulations may continue to grow, some of the key AI regulations and proposals in Europe, both at the EU level and in specific countries, are summarized here.

The EU AI Act is the most significant and comprehensive regulatory proposal at the EU level. It classifies AI Systems into risk categories—unacceptable risk, high risk, limited risk, and minimal risk—and imposes obligations based on these classifications.[xii] The EU AI Act describes these obligations as essential requirements, and it is expected that standards will be developed to support this legislation and determine how to adhere to its requirements.[xiii] Although the General Data Protection Regulation (GDPR) is primarily a privacy regulation, it has significant implications for AI, particularly around the use of personal data in machine learning and automated decision-making. The GDPR's provisions on data protection impact assessments, data minimization, and the right to an explanation, influence the design and deployment of AI Systems across Europe and beyond.

The EU's High-Level Expert Group on AI released guidelines, Ethics Guidelines for Trustworthy AI, to promote ethical AI development, focusing on principles such as transparency, fairness, and accountability.[xiv] While non-binding, these guidelines serve as a foundation for the AI Act and other national regulations.

At the national level within EU, several countries including Germany, France, and Italy have all been active in developing their own AI guidelines and regulations supplementing the EU AI Act.[xv] Other European countries, such as Switzerland and the United Kingdom, are also developing AI regulations. For example, Switzerland is actively shaping its approach to AI through proposed legislation that balances innovation with ethical standards.[xvi] Swiss lawmakers are focusing on ensuring transparency, accountability, and data privacy in AI applications, with particular attention to preventing discrimination and promoting human oversight. Switzerland's approach aligns with European regulatory trends, aiming to position the country as both a leader in AI development and a model for ethical, trustworthy AI practices. The UK has proposed a pro-innovation framework with sector-specific regulatory oversight rather than a one-size-fits-all approach.[xvii] It emphasizes collaboration between regulators and the private sector to ensure AI development aligns with ethical standards.

d. Global Governance

Due to the rapidly evolving landscape of AI regulations, the constant introduction of new rules, and the wide range of risks these regulations aim to address, there is a clear need for a global governance framework that supports regulatory compliance for organizations operating worldwide. Past global governance models for other technologies and risks have seen varying levels of success. For instance, the EU's General Data Protection Regulation (GDPR) has been

widely adopted beyond Europe to tackle privacy issues related to personal data. While some GDPR provisions apply to AI systems concerning data privacy, AI also presents additional risks—such as deepfakes, misinformation, hallucinations, and other threats—that pose significant societal, financial, and environmental challenges. Despite its broad influence, researchers struggle to fully assess the costs and benefits of the GDPR's implementation.[xviii] Similarly, international agreements aimed at banning human cloning or curbing nuclear weapons proliferation have yielded mixed global outcomes.[xix]

i. The United Nations

The UN Secretary-General's High-level Advisory Body on Artificial Intelligence (HLAB-AI) released a report outlining "a blueprint for addressing AI-related risks and sharing its transformative potential globally."[xx] The report offers recommendations for the UN, governments, and stakeholders to address gaps in current AI governance arrangements."[xxi] The report recommends a number of important UN functions for narrowing the AI divide largely between some developed countries and developing countries that would help ensure that all interested stakeholders can participate in governance. Beyond a few global coordination efforts, however, the report makes virtually no recommendations for ensuring accountability, conformance, or enforcement of AI regulations, standards, or guidelines.

The UN may very well be the best existing body to provide global coordination. The report's coordination recommendations, which include developing common understandings and harmonization on standards, merely provide support for global governance. These recommendations do not offer a framework for a global AI governance assessment and enforcement body.

ii. Other International Efforts

Numerous international initiatives address AI ethics and safety, although most are supported primarily by highly developed nations and well-funded corporations, unlike broader UN efforts. The OECD's AI Principles, developed by a select group of countries, set early standards with guidelines for transparency, inclusivity, and human rights in AI.[xxii] Similarly, the G20 adopted AI principles in 2019, aligning with OECD guidelines to ensure fair and responsible AI use across major economies.[xxiii] Both the OECD and G20 principles emphasize transparency, human-centered values, and the importance of balancing innovation with safety.

Recent efforts reflect further international consensus on AI governance. In 2023, the G7 outlined its vision for ethical AI, focusing on transparency, accountability, and robust standards, especially in high-stakes sectors like healthcare and national security.[xxiv] The same year, the Bletchley Declaration, signed by AI leaders from nations like the U.K, many key EU member states, and the U.S., underscored commitments to AI safety, proactive risk assessment, and regulatory alignment.[xxv] This declaration emphasizes collaborative efforts to manage the potential risks of advanced AI technologies, reinforcing a commitment to global cooperation as AI capabilities evolve rapidly.

These principles and declarations reflect an evolving global consensus on AI governance, where international cooperation and regulatory frameworks play a critical role in ensuring that AI technology benefits humanity responsibly and equitably. Despite international attention and progress towards a global AI governance framework, none of these efforts to date have resulted

in a framework designed to harmonize AI rules across economic sectors or one that is able to adequately assess and enforce compliance with applicable AI Rules[5].

iii. Standards Initiatives

Given the dearth of global AI governance frameworks, voluntary standards bodies have mobilized to address the conformity assessment vacuum. Standards bodies may model AI conformity assessment on their successful implementation of global industry-specific management standards and the conformity assessment tests that aid in assessing conformance to those standards. Global management system standards such as ISO 9000[xxvi] set management guidelines that can aid in creating consistent practices across industries. i.e., ISO 9001[xxvii] (a quality management standard). ISO 13485[xxviii], for example, provides a certifiable framework focused on quality, customer satisfaction, and continuous improvement in the medical field, which is specifically tailored for regulatory compliance for medical devices and specifies management system requirements from design through aftermarket vigilance. ISO 13485 has been "adopted" by regulators throughout the world, successfully harmonizing critical aspects of regulating medical device manufacturers, and may serve as a model for regulatory harmonization and compliance for AI Systems.

For AI, the JTC1 SC42[6] has developed ISO/IEC 42001[xxix], an AI management system standard, defining requirements for managing the lifecycle of AI Systems. SC42 is also developing guidelines for auditors' competence to provide confidence that an organization's certification to ISO/IEC 42001[xxx] is conducted by qualified personnel. Another forthcoming JTC1 standard will address AI impact assessment, focusing on identifying risks and benefits.[xxxi] In parallel, there is another standard being developed to guide the development of AI System certification schemes that look at AI Systems in a manner similar to product development.[xxxii] The EU's AI Act is driving CEN/CENELEC to establish European AI standards to support the Act's regulations.[xxxiii] Harmonizing these frameworks could address the global trend for reliable AI governance and assessment tools. These standards, if aligned, could be helpful in reducing the regulatory burden on AI developers doing business in the global market. Until such standards are fully developed and adopted globally, the AI industry remains awash in uncertainty as the speed of AI technology advancement outpaces regulatory harmonization and conformity assessment testing.

iv. Voluntary Pledges

Technology companies have recently committed to developing AI that is ethical, safe, and transparent. Microsoft promotes responsible AI through principles like fairness and transparency and has launched an "AI for Good" initiative.[xxxiv] Google's principles[xxxv] focus on safety, fairness, and avoiding harmful applications, with its DeepMind unit prioritizing AI ethics in healthcare. OpenAI emphasizes transparency in research and partnerships to ensure safe AI scaling.[xxxvi] Meta (Facebook) focuses on fairness with tools like Fairness Flow to address bias[xxxvii], while Amazon enforces a "Responsible AI" framework and has paused sales of its facial recognition

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[5] For purposes of this paper, ***AI Rules*** refers to the AI regulations, guidelines, voluntary standards and company pledges that collectively apply to the development, marketing and commercialization of AI Systems.

[6] JTC 1/SC 42 Artificial Intelligence is a standardization subcommittee of the Joint Technical Committee ISO/IEC JTC 1 of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

software to law enforcement.[xxxviii] IBM upholds principles such as transparency and privacy, offering tools like AI Fairness 360 to mitigate bias, and it opposes general-purpose facial recognition.[xxxix] Anthropic emphasizes human-aligned AI, prioritizing transparency and robust testing.[xl] Salesforce's "Einstein AI Ethics Board" oversees ethical AI in customer relationship management, and the company provides resources on responsible AI practices.[xli]

Together, these companies showcase a shift toward frameworks and tools aimed at building trustworthy AI across diverse applications. Each of these companies has also supported global initiatives, such as the OECD AI Principles and AI Bill of Rights initiatives discussed earlier. Notwithstanding their good intentions, it is unclear whether these companies will practically be able to live up to their pledges in practice.[7]

The next section discusses how the push for transparency is influencing licensing models, as stakeholders navigate conformance in the changing landscape of AI Rules.

III. Transparency and Open Licensing

Global AI governance efforts are increasingly focused on transparency, with open-source licensing widely promoted to enhance visibility and accountability. The EU AI Act exemplifies this by encouraging open source tools for high-risk AI applications to help detect bias and support collaborative oversight.[xlii] Similarly, the U.S. Blueprint for an AI Bill of Rights, while not legally binding, highlights the value of open source tools for scrutiny and transparency in AI, offering a guiding framework that many U.S. agencies and companies are adopting.[xliii]

International bodies also emphasize open source in their AI ethics guidelines. UNESCO's AI ethics guidelines advocate open source to mitigate biases, especially in sectors like education and healthcare[xliv]. The OECD AI Principles and the Global Partnership on AI (GPAI) support open source initiatives as a way to uphold transparency and fairness in AI but also acknowledge that risks should be addressed for open source and open access AI.[xlv] The U.K. National AI Strategy also supports open standards and open source software, particularly for public-sector AI applications, aiming to foster public trust and collaboration.[xlvi] The 2023 Bletchley Declaration underscores transparency and international collaboration in AI safety.[xlvii] Although it does not mandate open source, it promotes open research and model explainability, aligning with the goals of open source practices. Together, these efforts reflect a global shift towards transparency in AI, often leveraging open source frameworks to build trust and accountability.

The US has seemingly taken a different, more balanced, and innovation-focused approach as compared to the EU. The National Telecommunications and Information Administration (NTIA), in fulfillment of its obligations under Executive Order No. 14,110[xlviii] on AI, published a report[xlix] that summarizes the benefits and risks of making model weights widely available (the "**NTIA Repor**t"). After noting many benefits of open models, the NTIA stated: "However, making the weights of certain foundation models[l] widely available could also engender harms and risks to

[7] For example, Meta had formed a Responsible AI team and then disbanded it after complaints about red-tape, bureaucracy, and possible violations. *Meta shuts down its responsible AI team following internal restructuring*, (last accessed on February 1, 2025), https://coingeek.com/meta-shuts-down-its-responsible-ai-team-following-internal-restructuring/.

national security, equity, safety, privacy, or civil rights through affirmative misuse, failures of effective oversight, or lack of clear accountability mechanisms."[li] Given these risks the NTIA evaluated whether the U.S. government should restrict the wide availability of model weights for high-risk AI Systems rather than considering whether making model weights widely available should be required. The NTIA Report concluded that there was insufficient evidence to restrict open models at the time of the Report's publication, and that further data should be collected and monitored so that the U.S. government would be prepared to restrict the availability of model weights if significant risks emerge.[lii] Recent developments, such as China's DeepSeek AI System's extraordinary success has inspired further debate in the U.S. Claims that DeepSeek had an unfair head-start by using Meta's open source AI System to help China[liii] have clashed with Meta's reaction that: "DeepSeek's breakthrough shows that upstarts now have a chance to innovate and compete with the tech giants that have mostly had the A.I. playing field to themselves because A.I. costs so much to build."[liv]

a. Transparency Has Different Meanings

Given that there is no widely accepted global AI governance framework and the inner workings of AI Systems may not be understood by their creators[lv], many are calling for transparency as a way to gauge whether an AI System is harmful or whether the AI System can be assessed with regard to the relevant AI Rules. T*ransparency* in AI governance has different definitions, each with distinct focal points depending on the context and stakeholder perspective. These interpretations fall into a few main categories such as technical transparency (i.e., how does the internal model work), interpretability or explainability (i.e., what is the model's decision-making process), process transparency (i.e., how decisions are made throughout the model lifecycle including development, deployment and management), and outcome transparency (i.e., is the output accurate and unbiased).

Each of these definitions focuses on which stakeholders are seeking transparency. For example, technical transparency is concerned with developers, technical experts, and researchers. Interpretability transparency is important to end users, whereas process transparency may be more important to regulators and governance bodies than other stakeholders. Outcome transparency may be important to all stakeholders. Each of these definitions serves different needs in the AI governance ecosystem and contributes uniquely to building trust and accountability across stakeholders.

Whether open source AI Systems offer transparency under each of these definitions may be debatable especially for more complex AI Systems such as those using large language models and generative AI. For most stakeholders, particularly those not steeped in the technical details of AI Systems, understanding how an AI System operates and makes decisions may not depend on the AI System being open source. For example, DeepSeek R1 not only provides an answer to a prompt but explains how it arrived at the answer.[lvi] Nonetheless, transparency is often closely linked to the expectation that AI Systems should be open source.[lvii]

b. Open Source Advocacy

As part of the trend towards transparency, the Open Source Initiative (OSI) has developed a definition for "Open Source AI," tracking the criteria used in its open source definition (OSD).[lviii]

The OSD includes ten criteria that OSI uses to determine whether a license should be approved as an "open source" software license. Some of the key requirements of the OSD are (i) that the license must be royalty-free, (ii) that it may not restrict the field of endeavor (i.e., no field of use limitations), (iii) it must permit unrestricted modifications and redistribution even in competing commercial applications, and (iv) it may not require a physical acceptance such a click agreement or signature.[lix] While OSI has appointed itself as the arbiter of what constitutes "open source" in the software arena, not everyone agrees that OSI should be the sole arbiter or that the restrictive OSD is suitable for many open applications.

According to OSI: "These [approved open source] licenses make it easy to collaborate on, share, and reuse code because they provide clarity regarding "intellectual property" and usage rights." [lx] Many OSI-approved licenses are anything but clear. For example, it is unclear whether permissive licenses like the BSD or MIT licenses[lxi] grant rights to licensors' patents, and if so, the scope of such licenses concerning downstream modifications. The GPLv3[lxii] requires 12 pages of 11-point font text when downloaded to essentially state that it is free software and complies with the OSD. The only thing clear about the GPLv3 license is that there are numerous terms and conditions that must be read and understood.

The issue is not that OSI has developed a definition for Open Source AI, it is that OSI and its supporters will discourage entities from referring to their AI Systems as "open" or "open source" if the applicable licenses do not meet OSI's definition. Software developers have long been reprimanded for calling their software "open source" when their licenses deviate from the OSD.[lxiii] Some open source advocates have also referenced software that is not licensed under an OSI-approved license in pejorative terms.[lxiv] The same thing is now happening with AI Systems.[lxv]

As a result, some developers and businesses have chosen an OSI-approved license, not because it supports their technical roadmaps or business interests, but rather because they believe they need to market their software as "open source." Instead of choosing licenses that are tailored to their business objectives, they choose licenses that OSI has declared are open source. Doing so, however, can discourage those entities from making investments in innovation. This is not to suggest that OSI-approved licenses fail to foster innovation—indeed, they can drive progress in areas like pure research or among organizations seeking to pool resources to commoditize shared system components. Open source software (OSS) licenses are often not the best licenses for emerging technology where private investment is needed to spur innovation and commercialization. The OSD was not developed with innovation through commercialization in mind, but rather to promote a virtuous cycle of altruism.

The main reasons OSI and other open source advocates offer for supporting restrictive definitions of "open source" and shaming those who do not conform to them are: (i) the definitions make license choice easier for developers, and (ii) open-washing is just a marketing ploy by commercial interests that are not actually interested in leveling the playing field for smaller companies or generally promoting research for the common good.[lxvi] On the first point, most developers work for employers who pay them for software development and do not expect them to be licensing experts. Rather, developers are generally expected to review third party software licenses with their employers' attorneys before using third party software including OSS in the employers' products. Having licenses that are reused by many may be efficient. but the goal should not be to encourage developers to overlook their companies' policies because they believe they understand the licenses. As discussed above, just because OSS licenses are

royalty free, does not mean developers can ignore terms and conditions required by these licenses. The second point may ring true as a company's primary objective is to generate profits for its shareholders and investors. The idea that a company would invest substantial sums and resources to develop AI Systems with only the intent to promote research for the common good or to level the playing field for its smaller rivals is naïve at best, if not disingenuous. Imputing malfeasance or ill intentions to such companies is not likely to be a constructive way to solve the transparency challenge for AI Systems.

Criticizing companies for open-washing, but it raises broader issues specific to AI Systems. There are real risks associated with open AI Systems that may make it easier for bad actors to access and use AI tools for nefarious and harmful purposes. The NTIA has recently stated that: "[M]aking the weights of certain foundation models widely available could also engender harms and risks to national security, equity, safety, privacy, or civil rights through affirmative misuse, failures of effective oversight, or lack of clear accountability mechanisms."[lxvii]

c. Intellectual Property Rights and "Open" Licenses

i. Categories of AI System Components and Intellectual Property Rights Impacted

AI Systems include many components. Different researchers have attempted to develop classification frameworks for AI Systems that break them down into their component parts. For example one group has listed fourteen different components[lxviii], while another has identified as many as seventeen components.[lxix] These components however defined can be grouped into four general categories: documentation, data, software, and model weights. These categories are important because the intellectual property rights (IPRs) licensed to access and use the components differ by category. Just like OSI-approved licenses are appropriate for software licenses, other organizations have developed open licenses for data and documentation. The Creative Commons (CC), for example, has developed a number of open licenses for the sharing of copyrighted materials including documentation, but not software.

AI models themselves are generally made of two files. The first is software code referred to as the AI model architecture. The second file is fundamentally a substantial list of numbers that represents the model weights. The weights essentially increase or decrease connections between nodes dictated by the architecture. The weights are self-generated numbers (i.e., machine generated according to the AI software) produced as the model is trained.

AI software can be protected by copyright, trade secrets, and patents whereas documents are protected by copyrights and trade secrets alone. In the US, data may be protected as a trade secret, and the structure, sequence and organization of a database may be protected by copyright, but not typically by patent rights. Data licenses and document licenses do not need to address patents nor access to source code[8], unless the documents themselves include illustrative or reference source code. One of the reasons that the CC urges developers not to use CC licenses for software is that CC licenses do not address either patents or source code rights because these licenses were not drafted with software in mind.

The IPRs, if any, in model weights are more ambiguous. Since model weights are simply a list of numbers, they are most likely not copyrightable in the US because data alone is not generally

[8] The source code is the human readable form of a computer program.

copyrightable.[lxx] As noted, the model weights are also self-generated through the training process, and as a result, even the structure, sequence, and organization of these numbers are arguably machine-generated and functional, and accordingly likely not copyrightable.[lxxi] While debates may rage about whether weights should be protectable by copyright, and if so, who owns them if they are machine-generated, model weights can be maintained as trade secrets. Once the weights are disclosed without appropriate obligations of confidentiality, such as pursuant to an OSS license, trade secret protection would no longer be available.

In other jurisdictions such as the EU there may be *sui generis* rights in databases that protect the investment made in them.[lxxii] There are much better arguments that the model weights could be protected under such rights where laws protecting rights in databases exist. For now, there are different views as to whether model weights can be subject to copyright.

ii. The Open Source AI Definition and Licenses

OSI acknowledges that AI Systems are more than software programs. OSI's Open Source AI definition is based on the definition of AI System adopted in the OECD Principles discussed in Section I above. Like the model classification frameworks mentioned above, OSI recognizes that there are multiple AI System components and that these components can be categorized as data, software, or model weights.

In OSI's view the AI System components should adhere to the same principles that OSI relied on to develop the OSD for software. Specifically, they mention that anyone should be free to "use the system for any purpose and without having to ask for permission, study how the system works and inspect its components, modify the system for any purpose, including to change its output, and share the system for others to use with or without modifications, for any purpose."[lxxiii] To ensure that these principles are achieved, OSI has described the preferred form for which the data, software, and model weights must be made accessible.

According to the OSI Open Source AI definition each software license for AI System software components must be licensed under a license that has been approved by OSI as satisfying the OSD. The program's source code is the preferred form for software components since the source code, unlike executable or object code, can be read, understand, and modified by humans. Model weights and parameters must be licensed pursuant to OSI-approved terms. It is not clear what terms have been approved by OSI, but it can be reasonably assumed that all model weights and parameters must be published. OSI by way of example suggests "checkpoints from key intermediate stages of training as well as the final optimizer state" should be made available.[lxxiv]

The preferred form of data[9] is more complicated under the OSI Open Source AI definition. OSI recognizes that laws differ regarding, for example: (i) the use of data for training and then resharing of that data, (ii) sharing certain types of private data for any purpose, and (iii) precluding the use of certain data for training purposes. While OSI, requires that AI System data be made available under OSI-approved terms, those terms will not require that all data be publicly available and licensed under licenses that authorize unrestricted access, distribution

[9] The OSI Open Source AI definition uses this term essentially to describe which aspects of the training and other pertinent data need be disclosed along with the open source AI System.

and use (referred to hereafter as the "**Data License Exception**")[10]. Rather, the preferred form for data includes the locations where publicly available training data can be obtained, listings of commercial third party-licensed training data, and descriptions of the data used, including any data that cannot be shared. [lxxv]

Beyond the software licenses that OSI has approved as satisfying the OSD, OSI's definition does not point to any specific licenses for use with data, model weights or documentation.[11] The Linux Foundation, however, has developed several data licenses.[lxxvi] For the most part these licenses explicitly pertain to data, not databases, possibly creating confusion as to whether such licenses are being used with uncopyrightable data, and whether the licenses would be enforceable. The CDLA Permissive License Version 2.0[lxxvii] may satisfy the OSI Open Source AI definition as it is likely to comport with OSI-approved terms including the OSD.

Some of the other licenses offered by the Linux Foundation limit the field of endeavor in that they only authorize the use of the data for "Computational Use," [lxxviii]a restriction that would violate the OSD. If not for the Data License Exception, it is unclear whether those data licenses would be acceptable under OSI's Open Source AI definition. Similarly, other Linux Foundation data licenses permit unrestricted redistribution of the data including in the generated output or results, but only so long as the results include no more than a *de minimis* amount of the licensed data[lxxix]. It is likewise unclear whether the restriction on the use of data in an AI System's output, [12] a possible restriction on the field of endeavor, would violate the OSD. Notwithstanding any such violation, the Data License Exception would likely permit the use of such licenses for Open Source AI data components according to OSI so long as the definition's other data requirements are met.

The Open Data Commons has developed an open database license and licenses for the copyrighted content included in a database.[lxxx] The Open Data Commons Open Database License (ODbL)[lxxxi] is a well drafted license that likely satisfies the OSD and would be consistent with OSI-approved terms pursuant to OSI's Open Source AI definition. The ODbL, however, is a copyleft form of open license meaning that it requires licensees to make their changes and

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[10] It is noteworthy that the Data License Exception has been criticized for not comporting with the OSD principles. *See e.g.*, David Cassel, *The Case Against OSI's Open Source AI Definition*, The New Stack (Dec. 5, 2024), https://thenewstack.io/the-case-against-osis-open-source-ai-definition/.

[11] OSI does not appear to address documentation although as discussed in Section II.c, several scholars do include documents as components that make up AI Systems. Many OSI-approved OSS licenses purport to grant rights to the documentation provided with the software but generally do not distinguish between the two categories relative to the categories of IPRs that should be addressed, e.g., granted patent licenses in documentation could be viewed as granting rights to implement and use anything described in the documentation not just the source code as provided.

[12] Whether copyright would exist in the output is also unclear at this time. The U.S. Copyright Office took a stance in *Midjourney* stating that textual prompts culminating in an AI generated work is not human-generated and therefore, not eligible for copyright. But the Office did leave the possibility that some AI-generated works could be. "It is possible that other AI offerings that can generate expressive material operate differently than Midjourney does. However, on the administrative record before the Office, Ms. Kashtanova is not the author for copyright purpose of the individual images generated by Midjourney." See US Copyright Office Correspondence, Re: Zarya of the Dawn (Registration # VAu001480196) https://fingfx.thomsonreuters.com/gfx/legaldocs/klpygnkyrpg/AI%20COPYRIGHT%20decision.pdf at p 10. (Feb. 21, 2023). *See also* The U.S. Copyright Office, *Copyright and Artificial Intelligence Part 2: Copyrightability* (January 2025).

additions to the licensed database publicly available under the same royalty-free unrestricted terms. Such copyleft licenses may be problematic for entities that are either interested in maintaining the confidentiality of their own data, i.e., for business or privacy reasons, or because they combine the ODbL licensed data with third-party data that cannot be released under the terms of the ODbL.[13]

CC licenses are among the most popular open licenses used for AI System data components. These licenses, as discussed above, are not tailored to data or databases but any copyrighted materials other than software. The Creative Commons has developed several types of open licenses[14] including some that prohibit commercial use of the copyrighted work and/or the right to make unrestricted modifications, i.e., no rights granted to make derivative works.[lxxxii] Those licenses would not likely meet the OSI-approved terms requirement of OSI's Open Source AI definition because they restrict fields of endeavor or prohibit unrestricted modifications violating the OSD.

Other CC licenses such as the CC-BY and CC-BY-SA licenses are likely consistent with OSI-approved terms because they do not include these restrictions or others that would be prohibited under the OSD. As discussed above, the Data License Exception may nonetheless render any restrictions included in data licenses acceptable so long as an AI System licensor provides sufficient information about the data as required for making the preferred form of the data components available according to OSI's Open Source AI definition.

iii. Other Open Licenses

Other licenses, such as the OpenRAIL licenses, are specifically crafted with AI in mind.[lxxxiii] The Responsible AI License (RAIL) group offers a series of licenses including licenses that are appropriate for software, model weights, and for use with end user agreements. OpenRAIL licenses are "open" because access is granted to the source code or model weights, and they are "RAIL" licenses because they include use restrictions intended to discourage illegal, harmful, and discriminatory use, while promoting transparency. For example, OpenRAIL licenses prohibit the use of an AI System component that would harm minors or create deep fakes. These licenses require licensees to label their output as AI generated. Each category of OpenRAIL licenses includes a commercial use version as well as a research version. Because OpenRAIL licenses prohibit using an AI System component in irresponsible or harmful ways and in some cases restrict commercial use, these licenses would not be compatible with OSI's Open Source AI definition.

Fair Code licenses[lxxxiv], although not specifically designed for AI Systems, may be used for AI System software. These increasingly popular licenses[lxxxv] are sometimes used when developers are interested in making their source code available for test, evaluation, or research purposes.

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[13] It is worth noting that licenses promulgated or approved by OSI, the Linux Foundation, and the Creative Commons discussed in this section include both permissive and copyleft licenses. Permissive licenses generally only require attribution and the provision of the applicable license to any downstream recipient of the licensed component, whereas copyleft licenses additionally require the licensing of any additions or modifications made by each licensee under the same or consistent royalty free unrestricted terms.

[14] For a concise summary of some the differences between the ODC licenses and the CC licenses, and references to other open data licenses, see *Guide for Reproducible Research*, "Licensing", The Turing Way, https://the-turing-way.netlify.app/reproducible-research/licensing/licensing-data.html (last accessed Jan. 10, 2025).

Most of these licenses restrict certain commercial practices or may impose draconian measures if the licensed software is used for certain commercial practices. Such licenses may be useful for developers, especially startups, interested in offering transparency through their licensing approach, while assuring investors that they have implemented a thoughtful sustainable business model. Because Fair Code licenses include commercial restrictions, such licenses do not meet the requirements of the OSD and would not satisfy OSI's Open Source AI definition.

There are also a number of ethical source licenses that make the source code available but restrict various illicit or harmful conduct usually linked to corporate conduct such as labor practices and sustainability.[lxxxvi] These licenses like the OpenRAIL licenses could be useful for AI System components by prohibiting corporations and other users from using the licensed AI System components in ways that the developers of the AI System components did not intend. Such restrictions, however, would not be compliant with the OSD, and most likely would not satisfy OSI's Open Source AI definition.

Vanity licenses are often used when the source code is made available but the developer requires some specific action as a condition of the license, typically for personal gain or whimsy. For example, the Beerware license[lxxxvii] requires a licensee to purchase a beer for the developer. The O'Reilly Servlet license[lxxxviii] requires licensees to buy all members of their development team a copy of Mr. O' Reilly's book if the licensee uses the licensed software commercially. Postcardware licenses request licensees to send the developer a postcard to express their appreciation for the software.[lxxxix] These licenses, while having little applicability to AI or preventing risks associated with the use of AI Systems, may nonetheless be useful in providing transparency needed for AI governance. Some of these licenses, although not generally approved by OSI, may satisfy the OSD and could be consistent with OSI's Open Source AI definition.

OpenRAIL, Fair Code, ethical source, and vanity licenses are just a few examples of licenses that make source code publicly available for at least inspection and research. Software and other AI System components licensed under these licenses and similar licenses may provide all the transparency needed for AI governance if public transparency is needed at all. The following sections discuss AI System classifications that may be used to assess how open various AI System components should be for AI governance purposes.

d. Classifying "Openness" for AI Systems

Researchers at a number of universities and IBM, along with others from open source and generative AI associations proposed a framework for classifying AI System openness. The paper entitled: "The Model Openness Framework: Promoting Completeness and Openness for Reproducibility, Transparency and Usability in AI" by Matt White, Ibrahim Haddad, Cailean Osborne, Xiao-Yang (Yanglet) Liu, Ahmed Abdelmonsef, Sachin Varghese (hereafter "White, et al.") combines different groupings of AI System components to form classifications for completeness.[xc] They start by breaking down an AI System into seventeen components[15]. As

[15] : 1. Datasets, 2. Data Preprocessing Code, 3. Model Architecture, 4. Model Parameters, 5. Model Metadata, 6. Training, Validation and Testing Code, 7. Inference Code, 8. Evaluation Code, 9. Evaluation Data, 10. Evaluation Results, 11. Supporting Libraries and Tools, 12. Technical Report, 13. Model Card, 14. Data Card, 15. Research Paper, 16. Sample Model Outputs, and 17. Model Openness Framework Configuration File..[Matt White, Ibrahim Haddad, Cailean Osborne, Xiao-Yang (Yanglet) Liu, Ahmed Abdelmonsef, Sachin

discussed above, each of these components can be categorized as software, data, model weights, or documentation. The IPRs needed to access and use each component is based on which of these categories the component corresponds to.

White et al. are concerned that there are few open source AI Systems, and that those that are marketed as "open source" are merely employing "open-washing" marketing techniques. In their view, many AI Systems cannot be fully understood. To address this concern, they propose a classification framework in which access and use of the components are evaluated on the basis of completeness and openness, the Model Openness Framework (MOF).

The MOF has three classes for completeness, each including an increasing number of AI System components. The minimal class requires access to those components necessary to work with the AI System and understand its capabilities, constraints and the nature of the data used to train it. White et al. refer to this completeness class as the "**Open Model**" class. The intermediate class, the "**Open Tooling**" class, requires access to the AI components required in the Open Model class plus components needed to test the AI System's producer assertions (i.e., benchmark results). The most complete class, the "**Open Science**" class, includes the components required for the Open Tooling class plus the remaining components necessary for inspection throughout the model lifecycle along multiple fronts. The stated goal for the Open Science class is that no reverse engineering would be needed for full transparency.

After grouping components into classes denoting different levels of completeness, White et al. addressed the licenses that would be sufficient for access and evaluation of the applicable components.[xci] Given that White et al. are concerned about "open-washing" and the lack of open source AI Systems, their proposal for classifying "openness" is rather simplistic. They suggest that only two classes are needed to classify openness, the open class and the closed class. The open class includes components licensed under OSI-approved licenses for software and either the CDLA Version 2.0 or the CC-BY-4.0 for data, model weights or documentation.[16] The closed class includes components licensed under any other license, even the additional open licenses discussed in Section II.c.ii. and II.c.iii above.

A second group of researchers have noted that there is a spectrum of licenses between open and closed in developing their classification framework. The research paper entitled "Rethinking open source and generative AI: Open-washing and the EU Act" (hereafter "Liesenfeld and Dingemanse") addresses the authors' concerns that open-washing dilutes the benefits of open source and hinders AI research and development efforts.[xcii] Liesenfeld and Dingemanse express trepidation about the scores of lobbyists they predict will use their influence to "co-opt" the definition of open source, specifically by diminishing the acceptance of the OSD. According to Liesenfeld and Dingemanse, this will leave room in legislation such as the EU AI Act for open-washers to take advantage of regulations meant for open source AI Systems without giving back to the commons.

Liesenfeld and Dingemanse build on the MOF by including a third "partial" class to White's et al. "open" and "closed" classes for openness. They also take a different approach to White et al.'s

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Varghese, The Model Openness Framework: Promoting Completeness and Openness for Reproducibility, Transparency and Usability in AI, [cite: arXiv:2403.13784 [cs.LG]], last revised March 21, 2024).]

[16] White et al. also consider material dedicated to the public domain using a CC form of dedication, which is not a license but nonetheless ensures unrestricted and unconditional access to the material dedicated, as an approved license for "openness."

seventeen system components grouped into classes based on levels of completeness. Instead, Liesenfeld and Dingemanse classify AI System components along dimensional gradients related to how available the components are, how well the components are documented, and how much access is granted to components. Liesenfeld and Dingemanse identify fourteen dimensions mapped to availability, documentation, and access.

Each dimension was evaluated for forty AI text generators and seven AI text-to-image applications by assessing whether the dimension is open, partially open, or closed. They discuss several approaches to weight each of the openness classifications with a value and/or using different methods to compare the openness of each of the different AI Systems as a whole. While they do not describe the borders of what makes a dimension open versus partially open or partially open versus closed, it is clear that the yardstick for measuring openness is how close the applicable license is to meeting the requirements of the OSD.

Much of the disdain Liesenfeld and Dingemanse have professed for open-washing is primarily directed at large AI companies and their offerings such as Meta's Llama. They explain that these behemoths in the AI market "derive [all the] benefits…of open source without doing the requisite work, this sucks up the oxygen in the open source ecosystem, making it less attractive for smaller entities to find funding for truly open projects."[xciii] While Liesenfeld and Dingemanse recognize that smaller entities are making significant contributions to AI Systems, they contend that these entities are the ones most likely to purse open source AI models despite research showing the opposite as discussed in Section IV.a below.[17]

The lack of granularity by both research groups in assigning licenses to the "open" class appears to be based more on eliminating competition among AI System business models rather than ensuring transparency. Transparency merely requires sufficient access and understanding rather than unfettered rights to (i) redistribute and make the AI System components publicly available on a royalty free basis without any use restrictions, and (ii) use the AI System components for any purpose, even nefarious ones.

An approach for characterizing openness that is better aligned with the goal of transparency is addressed in the next section.

IV. The Access Approach

a. Business Competition Is a Key Component in Driving Innovation

Marketplace competition has long been a key driver of innovation. Competing products and services not only offer consumers choices but also push companies to innovate to stay ahead. Consumers often decide to purchase simple staples like food or tools based on feature

[17] "We also want to highlight the meaningful contributions by smaller players and non-corporate entities. In fact, these hidden champions of the generative AI world are where progress towards more open systems is most likely." (Dingemanse & Liesenfeld, p.1781). Despite the negativity towards larger players, it should be recognized that some have permitted distillation or have made available open source AI System components enabling faster and less expensive development of AI Systems such as DeepSeek. *See Did DeepSeek Copy Off Of OpenAI? And What Is Distillation?,* (last accessed February 1, 2025), https://www.forbes.com/sites/johnwerner/2025/01/30/did-deepseek-copy-off-of-openai-and-what-is-distillation/ and *Meta Engineers See Vindication in DeepSeek's Apparent Breakthrough,* (last accessed February 1, 2025), https://www.nytimes.com/2025/01/29/technology/meta-deepseek-ai-open-source.html.

differences and price comparisons. However, for complex offerings such as AI Systems, competition extends beyond features and price to include business models.

Business model competition can take many forms, with licensing being a key example. If all AI Systems were licensed according to OSI's Open Source AI definition, there would be little room for business model competition. AI Rules that require or show material preferences for definitions of openness such as the classification frameworks proposed by White et al or Liesenfeld and Dingemanse would similarly impede business model competition. Openness classification frameworks such as those proposed by White et al or Liesenfeld and Dingemanse, or ones that adhere strictly to OSI's Open Source AI definition are referred to here as **Open Source Openness Classification Frameworks**.

Business model competition is possibly more important for small and medium enterprises, especially AI Startups because they are entering the market in competition with much larger existing market leaders.[18] Startups are the cornerstone of innovation in market-driven economies like those in the US and Europe[xciv]. Forcing AI Startups through oppressive AI Rules or through public shaming to use only open source licensing models consistent with the OSD, however defined (an "**Open Source Mandate**"), will reduce business model competition along with the incentives to develop new innovative AI Systems. Importantly, a less competitive, innovative AI System marketplace is unlikely to result in safer, or more transparent AI Systems. Larger entrenched AI System developers will be able operate in difficult, albeit far from optimal, regulatory environments and against a backlash if their efforts include licensing practices that community activists see as "open-washing." Smaller entities, including AI Startups, will not have the resources nor the leverage to remain competitive, attract investment, and continue to innovate under an Open Source Mandate.

Currently, AI Startups are using a variety of business models through their choice of licensing models. As part of an ongoing research effort, this author has been conducting interviews with AI Startups to understand their AI System component licensing approaches and how they employ trade secrets and patents as part of their business models. C-suite level employees are interviewed and asked to describe their respective company's AI System, the specific use cases they are targeting, any AI risk scenarios they are concerned about in connection with their AI Systems, the nature of their licensing including whether they maintain any of their AI System components as trade secrets, and whether they file patents, and if so, generally how they intend to utilize such patents. The results of these interviews will be reported in a subsequent paper that will provide an analysis of the answers. It is worth noting, however, at this preliminary stage that the AI Startups interviewed thus far are using a range of different licensing schemes as well as trade secret and patent strategies. Table 1 lists a few examples, purely for illustrative purposes. The AI Startup's identities as well as any specifics about their AI System products, use cases, and risk profiles are being withheld at this time at the request of the AI Startups involved.

[18] Startups developing AI Systems or products or services that incorporate them are referred to as "AI Startups."

Table 1. Sample AI Startup Licensing Approaches Extrapolated from Interviews

Startup Interviews	Licensing Approach	Patent Approach
1	Commercial proprietary license for all components except for weights. Weights are not licensed and are encrypted. Will license limited footprint version openly for research purposes.	Limited patent filings for defensive use. They believe most AI inventions should not be patented.
2	Fully proprietary but access to all components even weights permitted to customers under NDA.	Files patent applications to attract investment.
3	Fully proprietary but will provide customer access to some components under NDA (benchmarking data) but not model weights.	Does not file patents because they feel it will give away too much, take too long to procure and anything they can procure can be easily designed around.
4	Fully proprietary for now but will consider open source if customers demand it.	Files patent applications for exclusivity and for attracting investment.
5	Fully proprietary but grants customers access to all components under NDA.	Files patent applications for exclusivity and for attracting investment.
6	Commercial products are licensed fully proprietary with no access under NDA. Non-commercial products are licensed under a research-only license.	Aggressively files patents. Mostly for defensive purposes but has considered possible outbound licensing.

The data shows that many AI Startups utilize different intellectual property licenses for their AI System components. Some of them will provide access to their customers for some or all of their AI System components under NDA. Other AI Startups will not permit access to any source code, data, or model weights even under NDA, whereas others will make some sample non-commercial components available under NDA. Some AI Startups have released certain AI System components under public research licenses, and others are considering open source licenses if their customers demand it.

Many of the AI Startups are filing patents largely to satisfy their investors' expectations, but several intend to utilize them for defensive reasons. Only one in this illustrative sample mentioned that they might consider licensing patents strategically and few have indicated they are not filing patent applications on AI-related inventions. The value of such patents could be

substantially diminished if AI Startups license their AI Systems components under OSD consistent licenses since in many cases doing so could set a comparable royalty rate for such patents at zero.

Based on this preliminary data, an Open Source Mandate would not be consistent with promoting AI innovation especially for AI Startups.

b. AI Risks Should Be Balanced With Innovation

As discussed above, there are numerous concerns about the possible illegal or harmful uses of AI. Debates continue over whether AI System transparency could mitigate these risks if AI System components are licensed pursuant to an Open Source Mandate. While many open source proponents believe that OSD-style licenses are the best way to achieve transparency, NTIA, for example, considered whether restrictions on open AI Systems would be beneficial[19]. The NTIA was especially concerned about curtailing innovation by mandating or showing strong preferences for open AI Systems. Because they did not find sufficient evidence to restrict the availability of open AI Systems at this time, they decided to collect more evidence before revisiting the issue.[xcv]

Although not addressed in the NTIA Report, evidence that should be gathered concerns the availability of conformance tests for assessing whether AI Systems conform to applicable AI Rules. As standards for conformity assessment, auditors, and use cases are adopted, practical conformity assessment mechanisms will be developed. Many of these mechanisms may be able to test black boxes[20] making the need for Open Source Mandates unnecessary, even if such Open Source Mandates do not disturb the balance between AI risks and benefits such as innovation.[xcvi]

c. Block Box Conformance Assessment

One group of researchers developed a certification scheme that provides a comprehensive workflow to assess compliance with emerging AI regulations ("Denzel et al.").[xcvii] Their approach is specifically tailored to provide conformity assessment for certain requirements imposed by the EU AI Act. As discussed above, the EU AI Act has various requirements that high-risk systems must comply with to ensure that the AI System is sufficiently transparent. Denzel et al. outline a certification framework that integrates technical testing, documentation audits, and continuous monitoring to address the EU AI Act's high-risk AI requirements.[xcviii] The certification process emphasizes lifecycle-based compliance, stakeholder involvement, and adaptability to evolving regulatory standards.

Some fully closed AI Systems, i.e. black box models, can be tested using model-agnostic methods for transparency. Denzel et al describe several such methods, SHAP and LIME being two examples.[xcix] They utilized these methods to demonstrate their certification scheme on an exemplary dermatological application. Regarding transparency, they first identify the relevant stakeholders and then determine appropriate technical methods for ensuring AI System

[19] It is important to note that the NTIA Report, unlike the AI Rules discussed previously that focus on open source as a means to achieve transparency, starts with the premise that open source licensing may result in more risks, not less.

[20] Black box testing is generally a software testing method that examines how a program functions without looking at its internal code. A black box in this context refers to the fact that the tester has no access to the AI System's internal workings or code.

transparency.[21] Consequently there are existing methods capable of assessing AI Systems where none of the AI System components are publicly available as is the case with many emerging AI Systems being developed by AI Startups. Where, however, such "Black Box Conformance Assessment" tests are not available or feasible, some AI System components may need to be licensed in a way that will enable sufficient inspection for transparency purposes.

d. License Categories Instead of Open Source Mandates

Even where Black Box Conformance Assessment tests are available, AI Rules or certain stakeholders may nonetheless require access to specific AI System components to provide transparency for specific use cases or risks. In these cases, license definitions may be needed to describe the required openness for these AI System components.

Licenses that would provide transparency must provide access to the software, data information, model weights, and documentation, as applicable, and the rights to evaluate the relevant AI System components. Existing Open Source Openness Classification Frameworks rely on licenses that authorize substantially more rights. These licenses require public access to all components, even when (i) access is required by only a small number of stakeholders, and (ii) public access could create more risks than transparency warrants. Additionally, most of the licenses that satisfy the "open" classification under the Open Source Openness Classification Frameworks grant rights to use the AI System components (at least the software and the model weights), modify, and redistribute them with few, if any, restrictions including for commercial use. Those license rights go well beyond the rights needed to investigate the AI System components and determine how the AI System works and makes decisions.

A different classification scheme is proposed here tailored to specific situations where transparency through Black Box Conformance Assessments is unavailable or insufficient. This classification scheme not only considers whether a sufficient Black Box Conformance Assessment test is available but also considers which AI System use cases and risk profiles merit access to AI System components to provide transparency. As discussed above, transparency not only has different meanings, but each meaning is focused on a different set of stakeholders. As a result, the proposed classification scheme for openness takes into account which stakeholders need access to evaluate the AI System, not whether the stakeholders need to use, modify and redistribute the AI System components for free and without restrictions in their own research projects or commercial products.

The proposed classification scheme, the "Access Methodology Framework" or "AMF", uses two broad license definitions when it is determined that access to certain AI System components is required for transparency - the Private Access (PA) and Open Access (OA) licenses. PA licenses grant access to the software, data, documentation, or model weights, as applicable, but under a non-disclosure agreement to the relevant stakeholders. OA licenses grant the public at large access to the applicable AI System component. Key to the AMF proposal is that the PA and OA licenses may limit modifications and use strictly for the purpose of evaluation and testing as needed to understand how a model works and how it makes decisions. Both licenses may

[21] Philipp Denzel et al., *Towards the Certification of AI-based Systems 3*, Table 1 (11th IEEE Swiss Conference on Data Science, 2024), https://fpschill.github.io/bibliography/files/2024_Denzel-etal_Towards-the-Certification-of-AI-based-Systems_SDS24.pdf.

strictly prohibit redistribution, public display, or performance, and may be limited to only those rights explicitly required to assess the AI System's conformance to AI Rules or to provide sufficient transparency to relevant stakeholders. As commercialization overtakes the development of standards as well as conformance assessment tests, the AMF's focus on access will enable entities to commercialize their innovative AI Systems without forfeiting important intellectual property rights and investment opportunities.[22]

PA licenses would, for example, be appropriate for certain commercial customers and partners, for very high risk AI Systems where broad access to the inner workings of the AI System may unnecessarily create safety, privacy or security concerns, or where an independent auditor is tasked to investigate the AI System for compliance with various AI Rules. OA licenses should only be required where large numbers of stakeholders need transparency into the inner workings of the AI System's decision making process that cannot be accomplished through access to a more limited category of stakeholders. Any license that would be classified as "open" under the Open Source Openness Classification Frameworks would also be considered an OA license but the list of acceptable licenses would go well beyond these licenses.

The methodology for implementing the AMF follows several steps that build on the stakeholder assessment proposed by Denzel et al. and the completeness classifications proposed by White et al. The relevant steps are as follows.

1. Determine if an appropriate Black Box Conformance Assessment test is available. If so utilize the relevant test and testing process.

2. When no Black Box Conformance Assessment test is available or additional transparency is needed, identify the stakeholders that require transparency, and if the relevant stakeholder group is sufficiently small, access can be provided through a PA License. If not, an OA License is needed.

3. Iidentify both the specific use case and associated risks to assess what level of completeness is required and the corresponding AI System components that must be evaluated to understand how the AI System operates or makes decisions. For example, one could use or modify the three completeness classifications used by White et al. to identify the AI System components that need to be licensed under a PA or an OA license as determined in step 2. See Table 2 for an example based on the MOF proposed by White et al but modified according to the AMF.

Table 2. White et al. completeness classifications as modified by the AMF.

AI System Component	Open Model	Access Model	Open Tooling	Access Tooling	Open Science	Access Science
Datasets	N/A	N/A	N/A	N/A	OA	PA
Data Processing Code	N/A	N/A	N/A	N/A	OA	PA

[22] For example, the EU AI Act permits the maintenance of trade secrets in complying with the Act's disclosure requirements. EU Artificial Intelligence Act, Art. 53, supra ("Any information or documentation obtained pursuant to this Article, including trade secrets, shall be treated in accordance with the confidentiality obligations set out in Article 78.)

AI System Component	Open Model	Access Model	Open Tooling	Access Tooling	Open Science	Access Science
Model Architecture	OA	PA	OA	PA	OA	PA
Model Parameters	OA*	PA*	OA*	PA*	OA**	PA**
Model Metadata	OA*	PA*	OA*	PA*	OA**	PA**
Training, Validation and Training Code	N/A	N/A	OA	PA	OA	PA
Inference Code	N/A	N/A	OA	PA	OA	PA
Evaluation Code	N/A	N/A	OA	PA	OA	PA
Evaluation Data	N/A	N/A	OA	PA	OA	PA
Evaluation Results	OA	PA	OA	PA	OA	PA
Supporting Libraries & Tools	N/A	N/A	OA	PA	OA	PA
Model Card	OA	PA	OA	PA	OA	PA
Data Card	OA	PA	OA	PA	OA	PA
Technical Report	OA	PA	OA	PA	OA	PA
Research Paper	N/A	N/A	N/A	N/A	OA	PA
Log Files	N/A	N/A	N/A	N/A	OA	PA

*Final checkpoints and optimizer state ** Intermediate checkpoints and optimizer state

Efficient implementation of the AMF would require research, or standards, that specify the AI System components that would need to be licensed under a PA or OA license on a use case-by-use case basis and with regard to certain risks. Such research or standards would involve AI technology and policy experts. The NTIA Report, for example, contemplates structured and staged access to AI System components offering different stakeholders access at different times. The NTIA Report also recognizes that openness falls on a spectrum[c] and does not seem to preclude licenses that would not meet the OSD, such as RAIL, ethical, Fair Code, and other licenses discussed above. When access is necessary, the AMF's approach of using either a PA or OA license for the required AI System components would be an appropriate licensing scheme, as outlined in the NTIA Report.[23]

While form agreements could be developed for PA licenses, most would be proprietary licenses that would have considerable variability among licensors. Common OA licenses, however, could be listed and maintained as a repository in a similar way that SPDX lists open source and public licenses[ci]. Having sample PA and OA licenses that could be used or adapted would allow AI System developers to easily choose licenses that would enable transparency without

[23] The NTIA report goes even further by noting that model cards and data sheets may provide sufficient transparency and visibility into the model's working and decision-making processes where there is no access to the model weights and other AI System components. *Id.* at p. 9.

unnecessarily sacrificing their IPRs and their profitability as may be the case with OSD-style and other "open" licenses.

IV. Conclusion

AI innovation will provide countless societal benefits. Effective global AI System governance is critical for curtailing potential risks associated with AI Systems without overly hindering AI innovation and the resulting benefits. As different AI Rules are adopted across the globe, entities commercializing AI Systems will need to navigate an ever-increasing patchwork of AI Rules. Conformity assessment tests that are developed to assess conformity on a black-box basis should be encouraged over Open Source Mandates.

Access to the inner workings of an AI System component may be sought where specific use cases or risks require more transparency because such conformance tests have not yet been developed or cannot be developed. Access does not require that everyone be granted unrestricted access in all cases, or unrestricted royalty-free rights to use and redistribute the AI System component as is prescribed under Open Source Openness Classification Frameworks. Instead, transparency requirements in cases where conformity assessment tests are unavailable or impractical should be defined on an AI System component basis by either an Open Access license or a Private Access license. The proposed Access Methodology Framework offers a useful step-by-step method to determine when an AI System component should be licensed under an Open Access or Private Access license. The Access Methodology Framework will offer a better balance than existing Open Source Openness Classification Frameworks in maintaining incentives to innovate with the need to understand how an AI System works and makes decisions, especially for small entities such as AI startups.

The concept of "openness" is becoming increasingly nuanced. Access to the intellectual property rights within AI System components, when necessary to ensure transparency, should not be tied to a specific definition of "open source." Instead, it should be limited to the smallest possible grant of rights that guarantees access only when required. The AMF provides such access, regardless of whether an AI system is referred to or considered "open source."

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