Impact of Artificial Intelligence Development on Taiwan's Legal System and Legislation in the Post-Pandemic Era

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Abstracts: In the post-pandemic era, AI development has entered a new phase, driven by the emergence of generative AI and the increasing prevalence of information and communication technologies represented by 5G. In the dawn of the AI age, significant shifts are underway, heralding a new era of transformation. This article explores the impact of AI advancement on Taiwan's legal framework during this era. It delves into both historical developments and prospective transformations and begins with a retrospective analysis of Taiwan's AI-related legislation before the post-pandemic era. Subsequently, it focuses on a critical aspect of Taiwan's AI legal framework during this era, including two pivotal documents in Taiwan: the "AI Basic Act" and the " Reference Guidelines for the Use of Generative AI in the Executive Yuan and its Subordinate Agencies and Affiliated Institutions". Both have recently garnered widespread attention, marking a crucial step towards navigating the evolving landscape of artificial intelligence. Finally, this article offers insights into the prospective evolution of Taiwan's legal landscape pertaining to AI. The formulation of the "AI Basic Act" is pivotal in setting fundamental norms for AI development in Taiwan. This draft is significant with its 24 articles aimed at fostering a trustworthy environment and promoting diverse AI utilization. It ensures that Taiwan's high-tech advancements align with global standards. On the other side, the "Reference Guidelines for the Use of Generative AI" are designed to regulate the administrative agencies in response to the widespread application of generative AI. Furthermore, since 2023, the Personal Data Protection Act and Criminal Code, among others, have all been amended to include provisions related to AI technology, reflecting the apparent impact of AI on the legal system. Given the novelty of AI in society, prioritizing the creation of a basic act is crucial. Such legislation defines AI in Taiwan, establishes ethical principles, outline development directions, and provides fundamental norms. It will serve as a cornerstone for shaping and revising other policies and laws to navigate the evolving landscape of AI.

Keywords: Generative AI, ChatGPT, AI Basic Act, Deepfake, Data Sharing, Data Protection, Privacy, Data Collection, Financial Data, Crime Detection, Labor Right, Autonomous Vehicle

1. INTRODUCTION

The emergence of the COVID-19 pandemic at the end of 2019 had a profound impact on the world, marking the most significant global public health crisis in recent years. This pandemic has induced significant shifts in our lifestyles and work patterns, some of which may revert to pre-pandemic norms as conditions improve, while others are expected to persist permanently. Fortunately, after 2022, the pandemic began to recede due to widespread vaccination [1], acquired immunity from prior infections, and advancements in medical treatments. These developments have mitigated the scale of devastation witnessed during the peak of the pandemic, marking the commencement of a "post-pandemic era [2]."

In the aftermath of the pandemic, reflecting on the transformations in human lifestyles and work dynamics, it becomes clear that technological advancement stands as the primary driver, with COVID-19 merely acting as a catalyst for these changes. One significant transformation lies in the essential role of information and communication technologies, notably 5G, in enabling online learning and remote work during the pandemic. Furthermore, the convergence of information and communication technologies with artificial intelligence (AI) has led to the expansion of AI applications and experiments, such as autonomous vehicles. Among the notable developments in the post-pandemic era is the emergence of generative AI, exemplified by the debut of ChatGPT at the close of 2022. This breakthrough has fundamentally reshaped public perceptions of AI, representing the pinnacle of AI advancements in the post-pandemic era.

This article examines the impact of AI advances on Taiwan's legal framework in the post-pandemic era. It delves into both historical developments and prospective transformations. The article begins with a retrospective analysis of Taiwan's AI-related legislation prior to the post-pandemic era. Subsequently, it focuses on a pivotal aspect of

Taiwan's AI legal framework in this era, the advocacy of the AI Basic Act, alongside the “Reference Guidelines for the Use of Generative AI in the Executive Yuan and its Subordinate Agencies and Affiliated Institutions.” Ultimately, this article provides insights into the prospective evolution of Taiwan's AI legal landscape.

2. TAIWAN'S AI LEGAL FRAMEWORK BEFORE THE PANDEMIC

The AI wave of recent years was ignited by AlphaGo's groundbreaking performance around 2016. AlphaGo's success in the game of Go marked the dawn of a new technological era, prompting nations and regions worldwide to allocate significant resources toward AI research, development, and application. By 2021, Taiwan, a prominent player in the global high-tech industry, had made substantial progress in establishing an AI legal framework. Government officials consistently underscored the significance of AI development and introduced numerous policies to support it. In their pursuit of fostering the holistic growth of AI, the importance of collaborative AI laws was also highlighted [3].

Before entering the post-pandemic era in 2022, Taiwan witnessed significant developments in its AI-related legislation. These included the enactment of the Financial Technology Development and Innovative Experimentation Act, often referred to as the Fintech Act, and the Unmanned Vehicle Technology Innovative Experimentation Act in 2018, commonly known as the Unmanned Vehicle Act. Furthermore, the Ministry of Science and Technology, now referred to as the National Science and Technology Council, introduced the AI Technology R&D Guidelines in 2019. Additionally, laws such as the Medical Devices Act, which was passed in 2020 and implemented in 2021, also witnessed corresponding amendments in AI-related legal regulations.

The Fintech Act and the Unmanned Vehicle Act represent pivotal milestones in the legal framework of AI development in Taiwan before the pandemic. Taiwan has placed an emphasis on smart finance and smart transportation as focal points for AI application and industrial progress. The Fintech Act serves the purpose of enhancing Taiwan's financial services environment [4], as explicitly articulated in its objective to "develop technology-based innovative financial products or services, facilitate the development of inclusive financial systems and financial technologies," while concurrently ensuring the protection of participants in innovative experiments and financial consumers. Likewise, the Unmanned Vehicle Act plays a vital role in advancing Taiwan's transportation services and industries [5]. Its stated mission is to "create a sound and safe environment for innovative experimentation, so as to advance the development of industry technology and innovative services [6]"

he most critical aspect of the FinTech Act and the Unmanned Vehicle Act is the provision that they make for an “innovative experimentation environment,” often referred to as the "sandbox." The development of AI technology represents a novel frontier for human society. Hasty deployment across various societal domains can lead to controversies. Consequently, lawmakers have carefully defined the parameters, allowing individuals to conduct AI experiments in finance and transportation within the bounds of the law. They have established a comprehensive system that encompasses the application process, the execution of experiments, and the dissemination of experimental findings. Simultaneously, within the confines of the relevant legal provisions, they have introduced mechanisms to adjust the associated legal responsibilities [7].

The 2019 AI Technology R&D Guidelines hold profound importance for Taiwan's AI technology research and development personnel. These guidelines aim to set ethical standards in AI research and promote the development of an AI-driven society that places a strong emphasis on "human-centered values," "sustainable development," and "diversity and inclusion." In essence, they emphasize that AI research and development should uphold human dignity and rights, enhance human well-being, seek coexistence and mutual prosperity between society and the environment without compromising environmental protection, and embrace diverse values. Furthermore, the guidelines promote interdisciplinary dialogue to ensure that the vision of AI development is comprehensible to all. The guidelines encompass eight key indicators, including common good and wellbeing, fairness and non-discrimination, autonomy and control, safety, privacy and data governance, transparency and traceability, explainability, accountability and communication.

In response to the advancement of AI, beyond the aforementioned regulations, there is an emerging influence of

AI evident in certain laws and regulations, notably within the field of medical devices. This is particularly obvious in the context of the Medical Devices Act and its associated provisions. In particular, Article 3 of the Medical Devices Act extends the definition of medical equipment to encompass "instruments" and "software." It becomes apparent that both instruments and software have intricate connections with AI, suggesting that AI-based instruments or software may serve as medical devices. Expanding upon this groundwork, a series of technical guidelines for the inspection and registration of medical devices and software integrating AI/machine learning technology, along with specific guidelines concentrating on computer-aided detection (CADe) utilizing AI machine learning technology, have been progressively introduced. These efforts collectively aim to shape the legal framework for AI-based medical devices.

During this period, AI was still in its initial stages of development and had limited societal impact. Legal changes primarily centered on experimental legislation aimed at fostering related industries and research. Simultaneously, due to the relative unfamiliarity of people with AI at the time, discussions regarding AI regulation predominantly revolved around soft laws like ethical codes, with less attention given to the formulation or revision of hard laws. However, by the end of 2022, the emergence of generative AI accelerated AI's influence on human life and work. To address evolving societal needs, there arose a pressing demand for expedited legal reform. Consequently, the establishment of AI legal frameworks began gaining attention from various sectors of society.

3. RECENT ADVANCEMENTS IN THE AI LEGAL FRAMEWORK IN TAIWAN

In the post-pandemic era, AI development has entered a new phase, driven by the emergence of generative AI and the increasing prevalence of information and communication technologies represented by 5G. These advancements have unlocked a myriad of possibilities for AI applications. For instance, in late August 2023, judicial authorities announced an initiative. In an effort to alleviate the workload of judges and enhance trial efficiency, the Judicial Yuan embarked on the development of generative AI applications in April 2022. Their aim is to utilize AI for the generation of draft judgments in cases related to unsafe driving and aiding in fraud. This AI-driven approach is intended to provide judges with references during their decision-making process. The judicial authorities have reported significant progress in this endeavor and plan to initiate a trial phase. Following this, they intend to expand the application gradually to encompass cases involving drug-related offenses, civil car accident compensation, and consumer debt settlements [8].

We have clearly entered the age of AI. Although it is still the early days of a new era, we can clearly feel the major changes that are coming. Recently, the development of Taiwan's AI legal system has received the most attention due to the advocacy to formulate the "AI Basic Act [9] " and the " Reference Guidelines for the Use of Generative AI in the Executive Yuan and its Subordinate Agencies and Affiliated Institutions” (hereinafter referred to as the “Reference Guidelines for the Use of Generative AI”) [10]. The formulation of the "AI Basic Act" hopes to establish basic norms for the development of AI in Taiwan. The “Reference Guidelines for the Use of Generative AI” are designed to establish rules for administrative agencies in response to the widespread application of generative AI. In addition, since 2023, the Personal Data Protection Act and Criminal Code, among others, have all been amended to include provisions related to AI technology, which shows that the impact of AI on the legal system has gradually become apparent.

3.1. Formulation of the AI Basic Act

In response to the surge in AI, the formulation of an "AI Basic Act" to regulate AI's development a shared objective for both Taiwan's private sector and government officials. On July 4, 2023, the National Science and Technology Council announced that Taiwan's draft Basic Act on AI is anticipated to be unveiled in September. This comprehensive legislation covers seven key aspects, including the definition of legal terms pertaining to, privacy protection, data governance, risk management and control, ethical principles and standards, industry promotion, and the legality of AI applications [11]. However, due to the rapid pace of AI technology advancement and its extensive range of applications, the Executive Yuan subsequently announced a postponement in the launch of the draft AI Basic Act. The delay is to allow for the integration of the latest technological developments and the

incorporation of AI ethics norms and an AI development framework to ensure its comprehensiveness [12].

The private sector is also actively engaged in the formulation of the Basic Act, in the hope for Taiwan's AI legislation to be enacted expeditiously, thereby enhancing the completeness of Taiwan's AI legal framework. Notably, the International AI and Law Research Foundation, a legal entity, publicly released the "Draft Artificial Intelligence Basic Act (Preliminary Discussion) " on March 25, 2023. This initiative, initiated in August 2022 and led by the CEO, Chair Professor Chang Li-Ching [13], in collaboration with other experts and scholars, serves both an advocacy effort and a means to generate broader interest in the AI Basic Act. The intention is to draw attention from various sectors of society to this legislation and encourage legislators to introduce the AI Basic Act in alignment with international standards [14].

The following highlights the notable endeavors and accomplishments of both the government and the private sector in the ongoing process of preparing to formulate legislation on AI.

3.1.1 The Draft "AI Basic Act " Proposed by the National Science and Technology Council

The emergence of generative AI has underscored the heightened importance of crafting AI-related legislation. Currently, countries including Europe, Germany, Japan, and South Korea, among others, have implemented overarching AI principles and have gone on to develop detailed AI standards to facilitate industry certification processes. In early July 2023, the National Science and Technology Council announced its proactive efforts in formulating pertinent drafts. Meanwhile, the Executive Yuan has indicated its readiness to release an official version of the AI Basic Act draft in September. Additionally, there are considerations to establish an "AI Anti-Counterfeiting Hub" to address the challenges posed by AI in the realm of authenticity verification [15].

In 2022, the Ministry of Digital Affairs of the Executive Yuan, along with the National Development Council and the National Science and Technology Council, established a "Digital Legal Platform" with the aim of developing legal frameworks for personal data and AI. The objective was to transition from self-regulation to formal legislation and from individual laws to a comprehensive legal framework. However, differing opinions emerged among participants, with some suggesting that it might be premature to discuss "law" and that it would be better to create self-regulatory guidelines within various ministries initially [16]. The National Science and Technology Council acknowledged that the integration of generative AI, such as ChatGPT, into people's daily lives would have a significant impact on society. Given that Taiwan had not yet established specific AI laws and industry evaluation standards, the need for an AI basic act became apparent. Nonetheless, the rapid pace of AI development, with changes occurring almost daily, posed challenges to standardizing regulations promptly. Striking a balance between early regulation and fostering industrial development was a concern for the National Science and Technology Council [17]. As a result, in early August 2023, the Executive Yuan announced a postponement of the scheduled release of the draft AI Basic Act, originally planned for September. This delay was necessitated by the swift evolution of AI technology and its extensive range of applications and impacts. The draft will be refined before its official release to address these dynamic developments [18].

Although the release of the draft has been postponed, the National Science and Technology Council has emphasized that current guidelines issued by various countries predominantly highlight the development principles of AI grounded in "human-centered values." These principles will serve as crucial references when crafting legislation pertaining to AI. Furthermore, government agencies will continue to monitor global developments closely and conduct comprehensive assessments, taking into account both domestic and foreign technological advancements, regulatory trends, and industrial impacts. An ideal AI Basic Act should encompass elements such as regulations for AI governance, the protection of intellectual property rights and personal identity, the reliability of data sources and outputs, as well as mechanisms for accountability and communication. Throughout the legislative process, collaboration with experts in science, technology, and the humanities is essential. In-depth dialogues with these specialists will help prevent AI from becoming a profit-driven tool for a select few companies and mitigate the potential for societal issues, including knowledge and resource monopolies and disparities between the affluent and the disadvantaged. The goal is to establish actionable regulations that align with Taiwan's unique needs [19].

3.1.2. Draft "Artificial Intelligence Basic Act (Preliminary Discussion)" Initially Proposed by the Private Sector

The official draft of the AI Basic Act has not been released yet, but civil society groups are actively collaborating across various sectors to advocate for its formulation. The following provides a general description and outlines the key features of the draft proposed by the private sector [20]:

3.1.2.1. Overview of the Preliminary Discussion of the Draft

In 2018, Taiwan set forth its vision of becoming a smart nation as one of its five major policy objectives, recognizing the pivotal role of AI within this ambition. As the 21st century commenced, computer software and hardware had reached advanced stages of development, and information and communication technologies were maturing gradually. These conditions were conducive to the mature development of AI. It became evident that the research, development, and application of AI would have a profound impact on the nation's future. AI represents not merely a technological innovation but also a driving force for transformative change in various industries and human lifestyles. Consequently, many advanced nations continue to allocate substantial resources to AI development, solidifying their global standing in the field of science and technology.

In recent years, advanced countries have been successively formulating AI-related policies and regulations, actively implementing them with the aim of gaining a competitive edge. These initiatives include the United States' "Federal Guidance for Regulation of Artificial Intelligence Applications", the European Union's "Artificial Intelligence Act", Germany’s "Artificial Intelligence Strategy of the German Federal Government" (Eckpunkte der Bundesregierung für eine Strategie Künstliche Intelligenz), Japan's Governance Guidelines for Implementation of AI Principles (AI 実践のためのガバナンス・ガイドライン), South Korea's "Framework Act on Intelligent Informatization", and China's "New Generation Artificial Intelligence Development Plan".

In response to international competition in the field of AI, Taiwan has been proactive in staying competitive. In 2018, the Executive Yuan approved the "Taiwan AI Action Plan" with the aim of nurturing AI talent, advancing research and development, and fostering collaboration with smart manufacturing, medical, and other industries. The goal is to propel Taiwan toward becoming a cutting-edge smart nation.

As the application of AI continues to expand, its imperative to acknowledge the negative effects and risks that it presents. Issues such as privacy infringements, bias and discrimination, unfair competition, security vulnerabilities, and job transformations have already surfaced. Therefore, in addition to fostering technological development and industrial growth, it's essential to enhance the operating environment and address critical aspects like ethics, legal framework development, data handling, and societal transformations within AI policies. To establish a trustworthy environment for AI development and promote diverse AI utilization, the creation of a basic AI act becomes crucial. Such an act ensures that Taiwan's high-tech advancements align with current international norms. Drawing inspiration from foreign legislative regulations and considering domestic industrial developments, the government has drafted the "AI Basic Act" comprising a total of 24 articles.

3.1.2.2. Key Features of the Preliminary Discussion of the Draft Act

As previously mentioned, this draft serves the dual purpose of advocacy and generating broader interest in the AI Basic Act. The aspiration is for people from all sectors to engage in discussions regarding an AI act that best suits Taiwan's needs and to expedite the enactment of an AI basic act in alignment with international standards. This “Draft Artificial Intelligence Basic Act (Preliminary Discussion)” mainly has six key features:

I. Legalization of Ethical Principles for AI. It is evident that AI research and utilization should prioritize human-centric values, aiming to benefit people, foster sustainable development, and adhere to fundamental principles such as autonomy, confidentiality, security, inclusivity, and transparency.

II. Industrial Development Strategy Guided by National Policies. Given AI's pivotal role in national development, it should be guided by overarching government policies and development strategies. This entails the

implementation of substantial initiatives for AI advancement, including talent cultivation, infrastructure establishment, and fostering of industry-academia partnerships through interdisciplinary and international collaborations. To ensure a consistent and ample resource allocation for sustained investment, budget allocations must meet the requirements, and fiscal and tax incentives should be combined to support and steer the AI industry ecosystem actively.

III. Prioritizing Social Equity and Safeguarding Vulnerable Populations. Recognizing the potential impact of AI on the job market and the resultant disparities in social resource distribution, the government should implement measures to protect disadvantaged groups, uphold labor rights, ensure a fair trade environment, and establish essential remedies, compensation, and insurance systems.

IV. Prioritizing Privacy and Personal Data Protection. Given the close connection between AI development and big data collection, it is imperative for the government to institute essential safeguards and oversight mechanisms for the collection, management, and utilization of data required in AI development and application, to protect individuals' privacy rights.

V. Establishing a Comprehensive AI Monitoring Sandbox. The government should create an innovative experimentation environment that offers secure zones and experimental space for pertinent research and development. This will allow for an appropriate assessment of the potential benefits and risks associated with innovative technologies and the flexibility to lift relevant regulatory restrictions when deemed necessary.

VI. Regulating AI Products and Services According to Risk Levels. Drawing inspiration from the European Union's 2021 draft "Artificial Intelligence Act" and the United States' 2022 draft "Algorithmic Accountability Act," the government must institute a risk assessment and regulatory mechanism. This mechanism will enable the appropriate regulation of AI development and usage, striking a balance between the potential benefits and harms of emerging technologies.

3.2. Reference Guidelines for the Use of Generative AI in Administrative Agencies

Promoting the draft of the Basic Act is a challenging task due to the rapid evolution of AI technology development and the broad scope of the legislation. Achieving a delicate balance between regulatory oversight and fostering industrial growth requires thoughtful deliberation. However, the imperative of legislation cannot be overlooked. The government must establish standards to ensure alignment with national governance and the needs of the public. In particular, in particular, the “Reference Guidelines for the Use of Generative AI in the Executive Yuan and its Subordinate Agencies and Affiliated Institutions,” which was approved by the Executive Yuan on 31 August 2023, has drawn attention from various sectors.

3.2.1 Reasons for Formulating “Reference Guidelines for the Use of Generative AI”

In late 2022, the release of ChatGPT sparked a global intrigue with generative AI. Renowned for its remarkable versatility, it marked a significant milestone in AI advancements. Generative AI has the capability to produce articles, music, images, and more akin to human creations. However, this process of data collection, learning, and content generation raises concerns regarding to potential infringement on intellectual property rights, disclosure of trade secrets, and other rights-related issues. Furthermore, the quality and quantity of data that used to train AI models can impact the accuracy of generated content, potentially leading to misinformation. Hence, there's a critical need for an unbiased and expert evaluation of the risks associated with generative AI.

Nonetheless, leveraging generative AI for business operations or service delivery unquestionably boosts administrative efficiency. To foster a unified understanding and set fundamental principles for its adoption within administrative agencies, the Executive Yuan in Taiwan ratified the “Reference Guidelines for the Use of Generative AI in the Executive Yuan and its Subordinate Agencies and Affiliated Institutions” on August 31, 2023. These guidelines prioritize the adoption with a sense of responsibility and trustworthiness when employing the generative AI. The core principles, including security, privacy, data governance, accountability, autonomy and control, are also

expected to be exercised with autonomy and maintaining control over the AI system by the administrative agencies or institutions. [21].

3.2.2 Main Points in "Reference Guidelines for the Use of Generative AI"

The "Reference Guidelines for the Use of Generative AI in the Executive Yuan and its Subordinate Agencies and Affiliated Institutions" consist of 10 articles [22] in total, encompassing seven main points, as follows:

I. The information generated by Generative AI shall undergo an objective and professional final evaluation by the staff regarding its risks, and shall not replace the autonomous thinking, creativity, and interpersonal interaction of the personnel.

II. The production of confidential documents shall be personally authored by the staff, and the use of Generative AI shall be strictly prohibited.

III. The staff shall not furnish Generative AI with information pertaining to official matters of a confidential nature, personal data, or any information not consented to be disclosed by the agencies. Furthermore, they shall not pose queries involving confidential information to Generative AI or employ generative AI for the collection or processing of personal data.

IV. Agencies shall not fully trust information generated by Generative AI, nor shall they rely solely on unverified output content for administrative actions or as the sole basis for public decision-making.

V. When agencies use Generative AI as a tool to facilitate the execution of tasks or the provision of services, adequate disclosure of such use shall be provided.

VI. The use of Generative AI shall comply with regulations governing information and communication security, personal data protection, copyright, and pertinent information usage. Agencies shall also be aware of the potential for infringement upon intellectual property rights and personality rights.

VII. Agencies may establish usage rules or internal control measures governing the employment of Generative AI based on the equipment and nature of the tasks involving its use.

The rapid evolution of AI necessitates concurrent updates in relevant legal regulations. The Reference Guidelines set forth fundamental principles for current utilization of generative AI across various administrative agencies, aiming to enhance understanding and ensure its proper use. Moving forward, the National Science and Technology Council will consistently monitor global AI development trends, regularly updates these guidelines to offer insights to different agencies. Each agency will then, as dictated by their operational necessities, be responsible for establishing their own usage rules or internal control measures that align with the provisions set forth in this Reference Guidelines.

Government employees in agencies affiliated with the Executive Yuan cannot be expected to become experts in the use of generative AI solely due to the introduction of guidelines. Therefore, the government should establish dedicated education and training channels. The Ministry of Digital Affairs should take the lead in creating relevant standards and training mechanisms. This will facilitate the government's utilization of AI to improve administrative efficiency and foster public trust in governance. It is crucial to uphold a responsible and trustworthy approach, maintain independent thinking and creativity, and strike a balance between risk management and innovative development when employing generative AI [23].

3.3. Other Legal Amendments Related to AI Development

The development of AI has continued despite the COVID-19 pandemic. In the post-pandemic era, legislators are actively pursuing legal amendments related to AI. Of particular interest to various stakeholders is the topic of data

sharing and governance, especially concerning the protection of personal information. Additionally, efforts to combat emerging crimes utilizing AI deepfake generation techniques have garnered significant attention.

3.3.1 Data Sharing and Governance

Big data plays a pivotal role and serves as the driving force behind the development of AI. The methods and scope of necessary data collection have become crucial considerations in this endeavor. Additionally, careful planning and thinking are essential to ensure data availability, define sharing methods, and delineate transaction domains. From the perspective of advancing AI, actively promoting data sharing among data holders (the public), especially when it benefits the public domain, holds significant potential for the broader society. Recognizing this, the Taiwanese government is aligning with global trends by developing a mechanism and legal framework for the public welfare application of non-personal data. The aim is to foster a social consensus and establish a data-driven public welfare promotion system unique to Taiwan.

In addition, from the perspective of safeguarding people's data privacy, it becomes essential to reinforce the fundamental aspects of personal data protection, with a primary focus on privacy-enhancing technologies. These technologies play a crucial role in preserving personal data privacy while enabling government agencies and other organizations to use data under reasonable conditions. These technologies also help establish a secure data utilization environment, employing methods such as data anonymization, data encryption, and access control permission management to protect sensitive information. In essence, privacy-enhancing technologies enable government agencies to improve data governance and ensure data's legitimacy. Therefore, it is imperative for the government to develop guidelines and standards actively for the implementation of relevant technologies. The public sector should also take the lead in collaborating with private enterprises to create an environment that promotes the use of privacy enhancing technologies and achieves the goals of effective data governance.

With the development and utilization of AI, the risk of personal data leakage gradually increases, and it may even be illegally used, resulting in new types of fraud. To encourage private organizations to prioritize the security of personal data, Article 48 of the Personal Data Protection Act was amended and promulgated on May 31, 2023. This amendment outlines the security obligations of non-public agencies, increases the fines for violations, and introduces severe penalties for violators. To further safeguard personal data, Article 1-1 has been added to the Personal Data Protection Act. This addition explicitly establishes the legal basis for the creation of the "Personal Data Protection Commission,"which in turn sets up an independent supervisory mechanism for personal data protection. These measures aim to enhance the oversight of both public and non-public agencies, ensuring the protection of individuals' right to information privacy as established in Article 22 of the Constitution.

3.3.2 Addressing Emerging Crimes Involving AI

Not long ago, Taiwan witnessed instances where politicians' or celebrities' faces were superimposed onto pornographic content through the use of AI deepfake generation techniques. These maliciously manipulated images were then disseminated and even sold online for profit by unscrupulous individuals. Consequently, Taiwan has taken a proactive stance against the creation of counterfeit images, audio, or electromagnetic records through computer synthesis or similar methods. These falsified materials can be incredibly convincing and challenging to differentiate from reality, making them easily distributable. If there is an intention to disseminate, broadcast, deliver, openly display, or create for others, or to use other methods for others to view false sexual images, it can cause physical and mental trauma, including embarrassment and fear, to the victims.

In an effort to safeguard individuals' privacy and personality rights, the Criminal Code was amended in 2023 to introduce Article 319-4, specifically addressing the creation of fabricated images through deepfake generation techniques. According to its provisions, "a person who intends to distribute, broadcast, deliver, display publicly, or use other means to allow others to view the victims’ synthetic sexual images generated using computer synthesis or other technological methods, which is able to cause harm to such victims," would be considered to have committed a criminal offense. "The same applies to distribution, broadcast, delivery, public display, or using other methods to allow others to view the aforementioned sexual images, which is able to cause harm to victims." In cases where

such criminal conduct is committed "with the intention of gaining profit," the penalties imposed will be more severe. The reason for the amendment is to include such activities as "computer synthesis, processing, editing, or other technological means, including deepfake techniques, to superimpose the victim's face onto explicit content involving another person" within the definition of "fabricating false sexual images of individuals."

In addition, fraud groups that are already widespread in Taiwan have recently employed AI technology to create fabricated audio content in a deepfake manner. This emerging method of fraud increases the susceptibility of potential victims, as it can be highly convincing and deceive a broad public audience. In the 2023 revision of the Criminal Code, the crime of aggravated fraud using deepfake images or sounds to commit fraud was added to Article 339-4, Item 1, Paragraph 4 of the Criminal Code. This article states that "using computer synthesis or other technological methods to produce synthetic images, sounds, or electromagnetic records about others is punishable." It is hoped that this new form of aggravated fraud can effectively curb this type of criminal behavior.

4. PROSPECTS FOR TAIWAN'S FUTURE AI LEGAL SYSTEM

In the future, the development of Taiwan's AI legal system is expected to face numerous challenges. In the wake of the post-pandemic era, where AI technology is continually advancing and finding application across diverse domains, there arises a critical need for ongoing adjustments in the legal and regulatory framework. These adaptations are essential to ensure that the utilization of AI can robustly safeguard personal privacy. Taiwan's forthcoming AI legal system must be attuned to the pace of technological advancement and aligned with the demands of the current society. Achieving this goal necessitates proactive collaboration among the government, industry, and academia to establish a comprehensive and resilient legal foundation. In the following sections, a brief overview of the prospects of Taiwan's AI legal system is presented.

4.1. Privacy and Protection in Data Collection

The performance and effectiveness of AI systems mainly depend on the quality and diversity of training and testing data. Data are the cornerstone of training models, so the quality of data collection directly affects the accuracy of AI. However, the collection and utilization process of big data can easily infringe on people's privacy. If companies or governments access people's data without consent, or accidentally leak it after access, it will lead to people's distrust and non-participation in data sharing. This may hinder the development of AI. In the future, when promoting relevant legislation, government units should carefully evaluate and promote specific policies and laws or formulate normative guidelines. Since smart finance and smart healthcare are the focus of AI development in Taiwan, this article will use these two as examples to elaborate further.

4.1.1 Financial Data Oversight

The introduction of AI into the financial industry has inevitably given rise to numerous emerging risks, with data-related concerns surrounding information security taking center stage. Currently, in the field of financial management and information security regulations, the Financial Supervisory Commission has approved the National Futures Association's "Self-Regulatory Standards for Emerging Technology Information Security." This approval aims to bolster identity verification protocols, specifically targeting the prevention of identity forgery through AI deepfake generation techniques. Additionally, the "Operation Guidelines for Investment Advisory Services Using Automated Tools (Robo-Advisor)" requires that investment consulting enterprises engaged in automated investment advisory services must effectively oversee and manage algorithm programs and calculation results. This oversight is crucial to safeguard the rights and interests of investors and to ensure the comprehensive construction of prevention, detection, and remediation measures for network security.

Future policies, exemplified by the Financial Cyber Security Action Plan 2.0 issued by the Financial Supervisory Commission, encompass a range of strategic measures. These measures include the ongoing task of "updating and revising security specifications or operational guidelines pertaining to emerging financial technologies and new security threats." This endeavor is pivotal in continuing the supervision of financial associations to address pressing concerns while ensuring the continuous refinement of information security self-regulations. In terms of

administrative guidance, amid the constantly evolving landscape of the financial transaction market, there is a concerted effort to support financial institutions in their innovation with AI technology while placing a strong emphasis on risk management and information security protection. The Financial Supervisory Commission has developed guidelines pertaining to AI applications in the financial sector, serving as a reference for industry compliance. Looking ahead, it is imperative for the government to continue encouraging financial institutions to practice self-discipline and to implement proactively measures that ensure the lawful use of AI technology, while maintaining risk controls over information security and privacy infringements.

4.1.2 Medical Personal Information Protection

The application of AI in the medical field has the potential to enhance medical efficiency, reduce costs, and offer improved healthcare services. However, the development of smart healthcare relies on the collection of vast amounts of personal information, including patient medical records, diagnostic data, and prescription information. It is imperative to prioritize the protection of the privacy of such sensitive data. For instance, in Constitutional Judgment No. 13 of 2022 [24], the Constitutional Court highlighted deficiencies in the information security oversight mechanism of the health insurance database. In the future, the government will inevitably need to make necessary adjustments and corrections to the handling of personal information.

Additionally, healthcare professionals should exercise vigilance in safeguarding personal information and patient privacy when utilizing smart medical equipment. In the short term, it is essential to establish guidelines for medical institutions on maintaining privacy and securing medical data when employing smart medical technology. In the long run, a proactive approach involves evaluating existing regulations, such as the Physicians Act, Pharmacists Act, Nursing Personnel Act, and Physical Therapists Act. This evaluation continually assesses potential information security risks associated with the implementation of smart healthcare. Moreover, it's vital to examine the necessity and feasibility of legal amendments. In summary, in the coming years, governments and medical institutions will need to roll out appropriate policies and regulations that strike a balance between AI development and data privacy protection.

4.2. Supporting Industrial Development and Innovation

The development of the AI industry will inevitably require strong support from the government. In addition to encouraging enterprises and research institutions to participate in the research, development and application of AI, corresponding incentives and legal regulations should also be provided as a backing. These policies and support measures are for the growth and innovation of the AI industry.

4.2.1 Ensuring Product Safety and Standardization

The standardization of AI products is crucial for ensuring their safety and predictability. For instance, in the realm of smart manufacturing, the integration of AI with industrial robots holds the promise of boosting production efficiency and addressing issues stemming from labor shortages caused by declining birth rates. It is essential to consider and address thoroughly inspection standards, procedures, information security guarantees, as well as the safety of the on-site personnel involved in human-machine collaboration within the robot-driven production processes. While the Ministry of Labor has already devised "Standards Governing the Prevention of Industrial Robot Hazards," it is imperative that we draw upon the experiences of foreign jurisdictions, such as the European Union, when contemplating the future use of AI in conjunction with industrial robots. This entails making adjustments and revisions to relevant laws and regulations and formulating the necessary inspection procedures, norms, and standards.

In summary, AI has significantly propelled the advancement of related manufacturing sectors in the post-pandemic era. To align with global trends, Taiwan should proactively strategize the establishment of a technology verification system for AI products that complies with international standards and seamlessly integrates with the international certification framework. Such a move can enhance the nation's industrial competitiveness, instill trust in the international marketplace, and foster international collaboration and technological interchange.

4.2.2 Strengthening the Legal Framework for Autonomous Vehicles

Autonomous driving represents one of the most advanced applications of AI. Safety is paramount in the development of self-driving vehicles. Taiwan, being a small, densely populated country with a complex road environment, must prioritize understanding and monitoring potential risks when considering the commercial use of autonomous cars. Currently, self-driving vehicles are still in experimental stages, which is insufficient to support the advancement of intelligent transportation. It is imperative to adapt and amend regulations such as the Road Traffic Management and Penalty Act and the Highway Act continuously to facilitate the growth of the smart transportation industry [25].

The Ministry of Transportation and Communication is actively developing the "Safety Guidelines for the Experimental Operation of Self-Driving Buses" [26] to ensure the safety and service capabilities of vehicles participating in the sandbox experiment. These guidelines draw heavily from international technical standards and are structured to provide guidance on various aspects, including ODD (Optical Disk Driver) scenarios, fundamental vehicle safety, network security, and automation security. In the foreseeable future, the smooth development of autonomous vehicles will hinge on the government's ability to establish comprehensive legislative measures. While regulations and measures can be extensive, they may not completely eliminate the risk of accidents in the rapidly evolving traffic environment. Therefore, as autonomous vehicles transition into commercial operation, it becomes essential to explore relevant insurance mechanisms. Further considerations and discussions should include creating incentives or formulating regulations that encourage insurance companies to propose suitable insurance programs and plans.

4.3. Protecting Vulnerable Populations and Labor Rights

The potential of AI extends across various fields, including healthcare, accessibility technology, and providing assistance to individuals such as children, the elderly, or those living alone through automated devices. This versatility positions AI as a powerful tool for supporting disadvantaged populations, enhancing their quality of life, and fostering social inclusion. However, it's essential to recognize that AI can also introduce discrimination, potentially harming vulnerable or specific ethnic groups. To prevent discrimination and societal division, the need for legislative measures should be carefully considered. Furthermore, AI's capacity to replace existing labor raises concerns about protecting workers' employment rights. For instance, as smart manufacturing advances, companies may significantly lower labor costs. Therefore, it's also crucial to focus on how to safeguard the future job prospects of workers and continually assess this matter.

4.3.1 Protecting Vulnerable Populations and Eliminating Discrimination

The risk of discrimination arising from AI can be attributed to data bias or the biases of the designers themselves. For instance, if a company uses an AI system to assist in selecting qualified candidates for interviews, it may inadvertently exclude certain ethnic groups due to the biases of the developers, resulting in employment discrimination. To protect vulnerable groups and prevent discrimination, it's crucial to ensure that the data used in AI models are diverse, encompassing such factors as different races, genders, ages, and geographical locations, to minimize data bias. Additionally, transparency and explainability in the AI calculation process are important to detect and address inadvertent discrimination issues arising from data computations or misapplications of natural science methods to the social realm [27].

In terms of legal regulations, the government should take an active regulatory role by establishing an independent regulatory agency or an ethics review committee, along with related mechanisms. These measures ensure that the use of AI-related products complies with legal, fair, and non-discriminatory standards, providing comprehensive protection to disadvantaged groups. Furthermore, given the widespread use of AI in the future, the government should proactively consider amending or adjusting key laws and regulations related to the protection of disadvantaged individuals and the prevention of discrimination. These may include such acts as the Employment Service Act, Mental Health Act, Long-Term Care Services Act, Senior Citizens Welfare Act, Social Welfare Fundamental Act, or even incorporating normative provisions within the Basic Act to safeguard the rights of the

disadvantaged and prevent discrimination.

4.3.2 Balancing Employment and Labor Rights

The application of AI in the field of smart manufacturing can greatly enhance automation on production lines, reducing the demand for manual labor. However, this increased automation can also result in job displacement, giving rise to the issue of "technological unemployment." Hence, striking a balance between AI-driven economic benefits and the safeguarding of labor rights is a crucial concern.

Taiwan's manufacturing and service sectors, including finance, may experience significant impacts due to the rise of AI technology. As these industries potentially face the need to lay off a large number of workers due to the introduction of AI technologies, government authorities should take proactive steps to support enterprises through the enactment of relevant laws and the establishment of supporting infrastructure, such as education and training programs or talent investment plans. These measures should aim to enhance the skills of employees, enabling them to either continue contributing to their current companies or transition to new companies. In essence, as AI technology threatens to replace traditional labor, the government should adopt a caregiving role. Through legislative actions and policy guidance, it can collaborate with industries undergoing transformation and implement comprehensive measures such as skill development and employment assistance. These efforts will not only enhance workforce capabilities but also foster positive labor-employer relationships.

4.4. Crime Detection, Prevention, and Emerging Crimes

AI has the potential to enhance crime detection and prevention significantly. For instance, utilizing techniques like big data analysis, machine learning, and pattern recognition can aid law enforcement agencies in predicting the likelihood of criminal activities, thereby enhancing their crime control capabilities. Additionally, AI can be leveraged to analyze crime data, helping investigative units identify crime patterns and trends, thus improving overall crime investigation techniques and make the crime prediction more precisely. However, it may also influence the decisions that made by the police or the court, such as whether there is enough "reasonable suspicion" or "probable cause" to stop or arrest a suspect [28]. Furthermore, AI-powered automatic identification systems can be instrumental in tracking criminal incidents and more. However, in Taiwan, there is currently a lack of clear legislation or policy guidance concerning the procedures, scope, and limitations of AI-assisted systems in criminal investigations. Moving forward, it is imperative to draw insights from international experiences and evaluate the need for formulating pertinent regulations. It is crucial to remain mindful of potential issues, including privacy rights infringements, the ramifications of bias and inequality, and the misuse of personal data.

As noted above, as with healthcare data, the mishandling or leakage of criminal data could undermine public trust in AI systems, with collateral consequences such as those convicted of crimes being excluded from many opportunities for a long time, including jobs, housing and financial credit. [29]. Therefore, in the future, when collecting, processing, and utilizing data for criminal investigation and prevention, even if it pertains to the personal information of criminal suspects or former convicts, it is imperative that competent authorities incorporate laws and policies aimed at bolstering the protection of personal information, given the substantial value of its information utility.

Furthermore, with the continuous advancement of technology, various countries have begun witnessing the emergence of new AI-related crimes. These crimes encompass such activities as disseminating fake videos and images, spreading false information via social media platforms to manipulate public opinion, influence election outcomes, or disrupt markets. In the face of these emerging crimes arising from the application of AI, as mentioned earlier, the Criminal Code has been amended accordingly with regard to the use of deepfake generation techniques to create deceptive images or commit fraud. However, it is crucial to acknowledge that AI can be employed in various other criminal forms. These may include generating and disseminating false news through AI, which can harm personal reputations or create societal unease. Moreover, during elections, AI may be utilized to manipulate electoral processes, potentially eroding the foundations of a democratic society. Therefore, government agencies must closely monitor regulatory authorities, and assess whether AI technology increases the risk of criminal

activities.

CONCLUSIONS

As society embraces the fourth industrial revolution, the research, development, and integration of AI emerge as pivotal forces reshaping human interaction and the legal landscape. The rapid advancement of AI may surpass our wildest expectations. Particularly in the post-pandemic era, AI appears to have permeated human society on a more extensive scale. The challenge lies in how the pertinent laws can safeguard individual rights and interests and ensure societal safety without stifling technological and industrial progress. This challenge tests the wisdom of legislators.

Taiwan has a longstanding reputation for technological advancements, positioning the island as a crucial technological hub globally. The advent of AI presents both opportunities and challenges to Taiwan. It is imperative to be well-prepared for AI's arrival across various sectors, including industry, scientific research, and the legal system. Given the relatively unfamiliar nature of AI in society, prioritizing the creation of a basic act is essential. Such legislation can define AI in Taiwan, establish ethical principles, outline development directions, and provide fundamental norms. This Basic Act will further serve as a cornerstone for crafting and revising other policies and laws. Fortunately, the government has actively initiated the legislative process, and it is expected that Taiwan's AI Basic Act will be finalized in the near future. Additionally, the government is reviewing existing laws and regulations, assessing the need for amendments or new legislation. Through collective efforts, it is anticipated that Taiwan's AI legal system will be more comprehensive, facilitating its transition into the AI era.

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During the same year, the Executive Yuan launched the "Taiwan AI Action Plan (2018 to 2021)" to foster AI development. See: Executive Yuan [https://english.ey.gov.tw/]. Taiwan AI Action Plan—Seizing the Opportunity to Fully Launch Industrial AI [updated 2019 Aug. 7; cited 2024 Jan. 19]: Available from: https://www.ey.gov.tw/Page/5A8A0CB5B41DA11E/a8ec407c-6154-4c14-8f1e-d494ec2dbf23. Presently, Taiwan's AI Action Plan has entered its 2.0 phase (2023 to 2026), further bolstering the advancement of artificial intelligence in Taiwan.

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DOI: https://doi.org/10.15379/ijmst.v11i1.3543