



Adaptive employment reform and inclusive skill transition action (AERISTA): The concept of collaborative labor law reform in response to automation

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Received Date: June 19, 2025

Revised Date: August 25, 2025

Accepted Date: August 25, 2025

ABSTRACT

Background: The Indonesian Constitution and labor laws guarantee the right to work and a decent livelihood, yet these provisions face serious challenges in the Society 5.0 era where artificial intelligence, automation, and other digital technologies disrupt labor markets at a scale that outpaces legal adaptation. Previous studies have identified fragmented regulations concerning termination of employment, limited training mechanisms, and the absence of fiscal instruments to address automation's social impact, but legal protections remain inadequate and reactive. This study aims to analyze the weaknesses of Indonesian labor law in mitigating automation-driven layoffs and to propose a comprehensive reform framework. **Methods:** Using normative legal research with statute, case, and conceptual approaches, supported by primary legal sources (such as the Constitution and Employment Law), secondary sources (expert analyses and journals), and tertiary materials (dictionaries and encyclopedias), data were collected through bibliographic studies and analyzed qualitatively through grammatical, systematic, and comparative interpretations. **Findings:** The findings show that Indonesian labor law is ill-prepared to anticipate mass layoffs, competency mismatches, and discrimination risks from AI-based recruitment, necessitating a holistic reform model. **Conclusion:** As a response, this study introduces a four-pillar framework that integrates the strengthening of labor policies to provide legal certainty, National Talent Mapping (an AI-based system to profile and align workforce competencies with industry needs), Mandatory Reskilling programs to equip workers with adaptive and competitive skills, and a Targeted Automation Tax as a fiscal mechanism to control automation adoption and fund social protection for affected workers. **Novelty/originality of this article:** AERISTA thus positions workers not as passive victims of disruption but as active participants in labor transformation, ensuring inclusivity, social justice, and sustainability in employment law.

KEYWORDS: automation; labor law reform; reskilling.

1. Introduction

The Constitution of the Republic of Indonesia 1945 (UUD NRI 1945) as the Constitution of the Unitary State of the Republic of Indonesia/*Negara Kesatuan Republik Indonesia* (NKRI) explicitly guarantees that every citizen has the right to work and a decent livelihood (Article 27 Paragraph 2 of UUD NRI 1945). This guarantee was then reaffirmed through Law Number 39 of 1999 on Human Rights, specifically in Article 38, as a fundamental right inherent to every human being. The recognition of equality in the right to obtain employment without discrimination is a right that cannot be ignored in Indonesian labor

Cite This Article:

Rakhman, M. R. M., & Moniaga, C. L. (2025). Adaptive employment reform and inclusive skill transition action (AERISTA): The concept of collaborative labor law reform in response to automation. *Green Governance: Exploring Politics, Social Justice, and the Environment*, 2(2), 91-107. <https://doi.org/10.61511/gg.v2i2.2025.2302>

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law. This mandate reflects the state's obligation to ensure the welfare of all its people, including in preparing for the various dynamics of development towards a high-tech era.

However, this constitutional and legal recognition still faces major challenges when confronted with the reality of technological developments that are moving much faster than legal adaptations. The right to work guaranteed by the state no longer simply means providing jobs but also ensuring that workers have the capacity to meet the new needs arising from the technological revolution. The era called Society 5.0 has radically revolutionized every part of the global social order, where artificial intelligence (AI), the Internet of Things (IoT), and various other automation technologies have been integrated holistically as solutions to meet various human needs while still prioritizing and paying attention to human values (Cabinet Office of Government of Japan, 2016). In other words, Society 5.0 does not only prioritize technological advancement, but also encourages social, economic, and legal readiness so that the sustainability of society can run fairly and inclusively. The employment sector is one of the areas that has been massively affected by automation technology, which has created inequality for various parties, especially workers and laborers.

In this context, automation is not only about technology, but also about social justice. Radical alterations in the labor market structure demand the existence of regulations that can balance the interests of industry with the rights of workers. In the absence of clear regulations, the risk of unfairness will become more and more apparent, where only highly educated groups will be able to thrive, while low-educated workers will be increasingly marginalized. For these reasons, readiness for Society 5.0 is not merely a matter of technological infrastructure, but also regulatory readiness that protects all levels of the workers.

Table 1. Data on the workforce with lower secondary education

| Educational Attainment | Working | Ever Worked | Never Worked | Total unemployment | Total Labour Force |
|---|--------------------|------------------|------------------|--------------------|--------------------|
| Primary school and below | 51,785,137 | 745,370 | 482,788 | 1,228,158 | 53,013,295 |
| Junior high school | 25,477,765 | 600,311 | 490,704 | 1,091,015 | 26,568,780 |
| Senior high school | 30,234,509 | 925,704 | 1,367,655 | 2,293,359 | 32,527,868 |
| Vocational high school | 18,592,770 | 816,796 | 1,023,366 | 1,840,162 | 20,432,932 |
| Diploma III | 3,359,096 | 92,436 | 78,091 | 170,527 | 3,529,623 |
| Diploma IV, Bachelor, Master, Doctoral Degree | 15,192,727 | 317,878 | 524,500 | 842,378 | 16,035,105 |
| Total | 144,642,004 | 3,498,495 | 3,967,104 | 7,465,599 | 152,107,603 |

(BPS, 2024)

This is reflected in statistical data that was compiled by McKinsey & Company in "Automation and The Future of Work in Indonesia: Jobs Lost, Jobs Gained, Jobs Changed" that as more than 23 million jobs in Indonesia could have the potential to be replaced by automation by 2030, while the new technologies are also predicted to have the effect of creating 27 to 46 million new jobs (Das et al., 2019). The validity of this data is also being supported by the World Economic Forum in its report entitled The Future of Jobs Report 2025, which states that in 2030, it is projected that 170 million new jobs will be created, accompanied by 92 million old jobs being replaced, meaning that there will be an additional 78 million jobs (World Economic Forum, 2025). Regardless of the dynamics of projected changes in the number of jobs in these statistics, the majority of completely new jobs require high qualifications and skills from workers and laborers that can only be obtained through higher education. Meanwhile, in August 2024, data from the Central Statistics Agency/*Badan Pusat Statistik (BPS)* showed that of the total 144.6 million Indonesian workers, more than 70 percent had only completed lower secondary education (BPS, 2024).

This reality highlights a serious gap between the readiness of the national workforce to adapt to the new skill demands of the Society 5.0 era. This is particularly true for vulnerable groups with low levels of education, who are at greater risk of economic exclusion due to the massive wave of automation. This problem is not only threatening the welfare of workers and laborers in Indonesia but also is a problem for the international community. For example, in early 2025, Workday, a leading provider of human resource management software, laid off workers en masse, replacing 1,750 employees with an AI agent called Agent System of Record (CNBC Indonesia, 2025). Since 2024, this situation has been happening on a massive scale, with around 203,946 workers reported by Trueup.io and BestBrokers experiencing job losses, mainly in the United States. Several leading companies are included in this list, such as Dell, Intel, and Tesla (Nurdifa, 2024).

Indonesia has also been experiencing some significant job displacements due to automation. Since the start of the Fourth Industrial Revolution, there have been 240,000 workers who were laid off due to automation from the period of 2016 to 2018 (Farasonalia, R. & Khairina, 2019). Meanwhile, according to the most recent data from January to February 2025, the automation has led to 18,000 workers being laid off (Sundayana, 2025). The realities on the ground require an immediately effective, accurate, and swift response so that the unfavorable effects of the automation do not persistently diminish the welfare of workers and laborers in Indonesia.

The main legal issue with the phenomenon of large-scale layoffs is that positive labor laws have yet to provide for a comprehensive regulation to anticipate the consequences of automation technology on industrial relations, wages, and labor protection systems. However, in other than being mandated in the constitution, Article 4 letter c of Law Number 13 of 2003 concerning Employment as amended by Law Number 6 of 2023 concerning the Stipulation of Government Regulation in Lieu of Law Number 2 of 2022 concerning Job Creation into Law (Law of Employment) also emphasizes that the primary purpose of labor law is to protect the welfare of workers and labors, mainly in Article 4 letter c. The legal issues include, at a very least, the unavailability of a clear and straightforward definition of automation technology in relation to employment, the lack of regulations on work recruitment using AI, the open availability of opportunities to achieve efficiency through the termination of employment without clear parameters, and the unsurpassed lack of legal instruments to control employers in achieving their efficiency goals.

The issue of labor law in the era of Society 5.0 has been researched extensively in several previous studies. Angel Miranda has examined the need for comprehensive legislation to protect the rights of workers and laborers in Indonesia, since automation as a cutting-edge of new technology has brought about profound changes in the era of Society 5.0 (Angela, 2023). This is because the arrangements related to termination of employment are still not adequate to meet the most modern needs. In their review, Satriya & Basid (2024) also found that disadvantages as a basis for efficiency in the framework of termination of employment regulated through Article 43 paragraph (2) of Government Regulation Number 35 of 2021 concerning Fixed-Term Employment Agreements, Outsourcing, Working Hours and Rest Periods, and Termination of Employment contain legal ambiguities (*obscure libel*) that can be used as a basis for large-scale automation because the restrictions provided in these provisions are only in the form of proof requirements with company financial statement audits, even though the financial statements issued could be the result of manipulation by the company. The legal protection currently provided is only restricted to the provision of severance pay, the provision of service awards, and the provision of compensation which is equivalent to the impact of the termination of employment (Satriya & Basid, 2024). Shidqie (2025) then initiated the need for a special taxation instrument on automation as a form of controlling the high unemployment rate in Indonesia through a comparative study of its implementation by other countries in the world as a reference for formulating the most appropriate model for Indonesia. Caesar found that this special tax is a regulatory function implemented in many forms in other countries, such as the imposition of income tax on automation and specific taxes, so Indonesia is recommended to use an earmarking tax scheme (Shidqie, 2025).

All of the above previous studies essentially state one thing, namely that positive law is still not fully adaptive to technological disruption, both in terms of regulations, protection, training and development, and social protection for workers (Dianova & Kaendo, 2023). This situation necessitates a comprehensive and futuristic reconstruction of labor laws to align them with the mandate of the constitution and accelerate them in line with the challenges of the times, particularly automation. Therefore, this study aims to analyze the weaknesses of labor laws in Indonesia, including the formulation of ideal regulations as solutions to various problems related to termination of employment in the era of society 5.0 to mitigate the impact of automation technology. These solutions are then systematically outlined in a concept called AERISTA, which stands for “Adaptive Employment Reform & Inclusive Skill Transition Action.” This article will begin by describing the urgent need to integrate AERISTA into national labor law as a response to the problems in Indonesian labor law. Then, the AERISTA concept will be further elaborated in relation to its implementation model in the reform of labor law in Indonesia.

2. Methods

This research is classified as normative legal research or doctrinal research, which Sutandyo Wigiyosubroto describes as research on law using various arguments as the basis for further formulation of the law (Muhaimin, 2020). This study aims to describe the urgency of the AERISTA concept as a form of labor law reform in Indonesia in addressing the challenges of automation in layoffs in the era of society 5.0 by relationalizing it with legal principles, principles, and rules. The approaches used are the legislative approach, the case approach, and the conceptual approach. All three approaches are complementary to each other. The statute approach ensures that the analysis is based on the hierarchy of the applicable legal norms. The case approach provides a concrete dimension by examining existing labor practices or disputes, so that the discussion is not abstract. Meanwhile, the conceptual approach allows researchers to develop a new concept, namely AERISTA, by connecting relevant legal principles and theories. With this combination, the study is not only descriptive but also analytical and prescriptive.

The legal materials used consist of three types, namely primary, secondary, and tertiary legal materials in line with this study. Specifically, the authoritative primary legal materials include (a) the Constitution of the Republic of Indonesia 1945; (b) Law Number 13 of 2003 concerning Employment as amended by Law Number 6 of 2023 concerning the Stipulation of Government Regulation in Lieu of Law Number 2 of 2022 concerning Job Creation into Law; (c) Law Number 7 of 2021 concerning Harmonization of Tax Regulations; and (d) others that are related to this study.

Furthermore, secondary legal materials, which are legal materials that further explain the primary legal materials used in this study, include legal expert opinions, textbooks, and legal research results in journals and magazines. Finally, tertiary legal materials are legal materials that explain primary and secondary legal materials, including legal dictionaries, language dictionaries, legal encyclopedias, and encyclopedias, such as the Great Dictionary of the Indonesian Language.

All legal materials will be collected through a bibliography study, which will then be processed and analyzed further using qualitative techniques. These techniques in legal science are carried out through interpretation methods, which in this study use grammatical interpretation, systematic interpretation, and comparative interpretation.

3. Results and Discussion

Promoting the readiness of labor laws in facing automation technology needs to be pursued progressively and sustainably. Given this need, the author proposes a conceptual model called AERISTA. This program is an adaptive legal framework based on four main pillars, namely strengthening national labor policies, national talent mapping, mandatory

reskilling, and targeted automation taxation, with the involvement of various stakeholders as the main drivers who hold the key to its successful implementation. This concept is designed to create a resilient and inclusive employment ecosystem towards Society 5.0 in a socially just and sustainable manner. The goal is none other than to guarantee the fulfillment of the rights of workers and laborers in the era of Society 5.0 so that technology is directed as a means of improving their welfare and that of the people in general.

The main essence of AERISTA is to improve and strengthen the legal basis of national labor because without a solid foundation, efforts to protect the lives of workers and laborers also become difficult. This concept also utilizes various existing national resources and work programs with various adjustments to the specific characteristics of automation technology. In addition, fiscal instruments are used as a control tool that the government can use to slow down the pace of automation so that the transition process is inclusive and reduces the infringement of workers' and laborers' rights. The AERISTA concept can be visualized in the following figure, where each pillar will also be explained further.

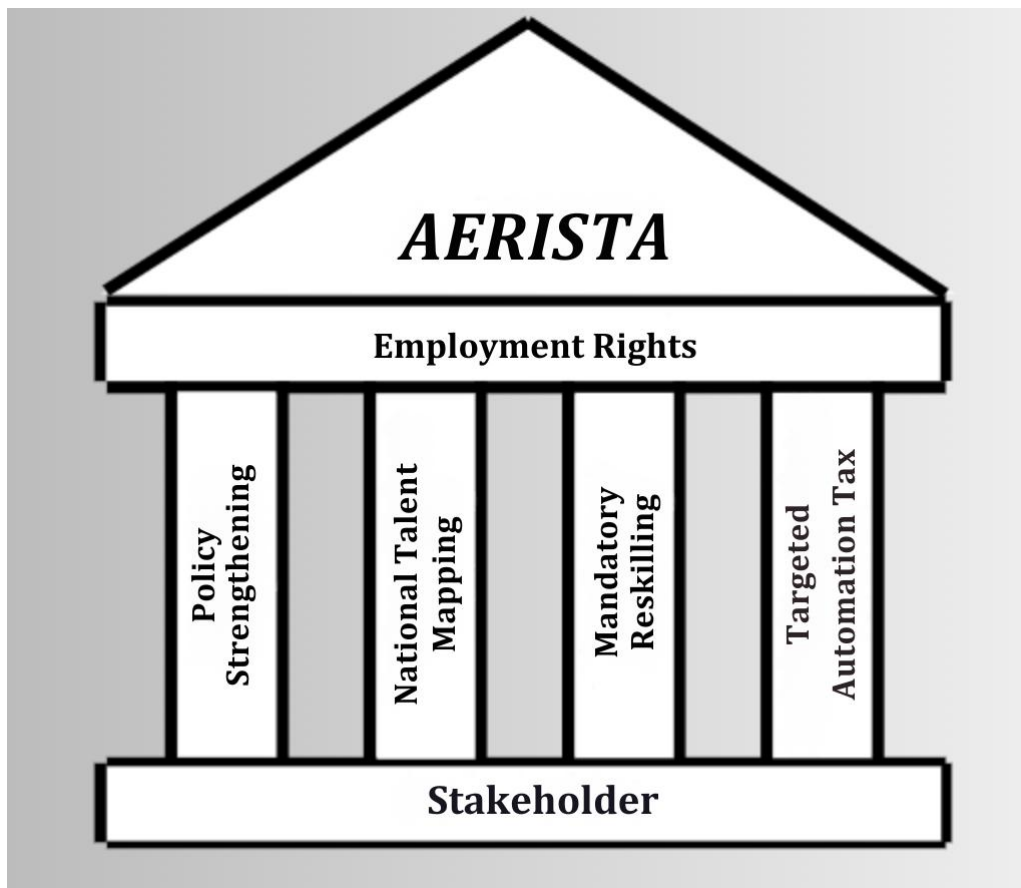


Fig. 2. AERISTA concept

3.1 *Strengthening national labor policies as a solid foundation for guaranteeing workers' and laborers' rights*

Legal certainty is one of the main objectives that must exist, in addition to justice and benefit. Legal certainty also contains the value of justice because clear rules without ambiguity prevent the community from being subjected to arbitrary actions by other parties, thereby better protecting the rights of the community. Jeane and Indrawieny argue that certainty is the essence of law because certainty leads to compliance with the law by the community. Furthermore, legal certainty contains the values of predictability, justice, order, protection of human rights, openness and accessibility, and legality (Neltje & Panjiyoga, 2023). Therefore, consistent and unambiguous national labor laws will provide

legal certainty to workers and laborers regarding their rights, so that readjustments should be made to create a sense of order.

The lag in Indonesian labor law in keeping pace with developments in automation needs to be anticipated through a holistic reform of labor law. This can be done by reconstructing the provisions of the Law of Employment, which is the legal umbrella for labor, so that it can function optimally. Problems in the Law of Employment can be identified in three (3) major groups, namely before work, during work, and after work. Legal issues related to pre-employment have rapidly developed in practice using AI as a means of recruiting workers. This statement is supported by data presented by GoodStats, which shows that 20% of Indonesian companies have integrated AI into their work recruitment processes, as further outlined in the following Figure 3.

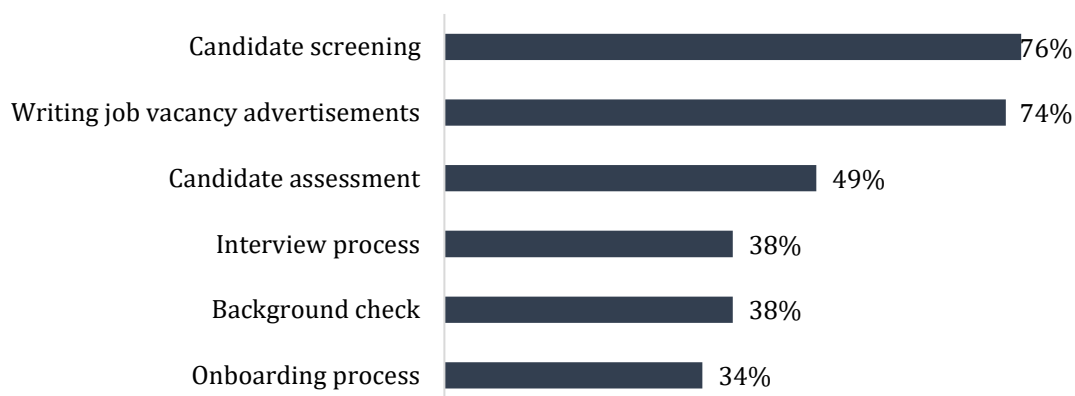


Fig. 3. The role of AI in workforce recruitment in Indonesia (Farhan, 2025)

Automation technologies such as artificial intelligence can make biased decisions, including in employment matters, if used improperly, potentially leading to discriminatory and unfair treatment of workers or laborers (Sonderling et al., 2022). Such bias can be based on a person's background, such as religion, age, and so on, which is sourced from its creator or the AI system because of training (Syahril et al., 2024). The lack of regulations on the use of automation technology, including in the decision-making process regarding employment, has created a loophole that prevents workers from exercising their right to work (Ahsinin & Pamungkas, 2023).

This certainly is contradicted by the spirit of the Law of Employment, which aims to eliminate discrimination against workers, especially the enjoyment of the right to equal opportunities in obtaining employment, as stated in Articles 5 and 6 of the Law of Employment. Of course, there needs to be specific regulations on the use of AI in recruiting workers. The author proposes that employers must disclose to prospective workers and employees that AI is used in the selection process for job vacancies they open. Furthermore, the results of the selection using AI must be communicated to workers and employees along with the reasons for rejection so that there is clarity on the basis for the decision. Another important point is that employers must provide opportunities for prospective workers and employees who are rejected to file an objection. This is a manifestation of human intervention in the work recruitment process, without relying entirely on AI, which can be biased, thereby reducing discrimination against prospective employees and workers, while still utilizing automation technology.

The issue of norms in the Law of Employment related to regulations during work mainly lies in the obligation to provide job training. Referring to the definition in Article 1 point 9 of the Law of Employment, the obligation to provide job training is only intended for the development of skills related to one's position or job. This is further emphasized in Article 12(3) of the Law of Employment, which states that the guarantee of the right to receive job training is only applicable to the scope of their duties. In other words, the

definition of job training is limited to enhancing existing skills, rather than acquiring entirely new competencies for workers and employees as required by the labor market. However, current work competency requirements are cross-disciplinary and combined, so the concept of job training in the Law of Employment, which is limited to developing competencies relevant to their field (upskilling) and tends to reduce competitiveness, needs to take into account the fact that workers or laborers also need new competencies and skills through retraining (reskilling). This highlights the need to emphasize reskilling training, as also recommended in several previous studies, with an emphasis on conducting reskilling alongside upskilling (Attallah et al., 2024; Hidayanto et al., 2023).

Termination of employment under the Law of Employment remains controversial in relation to employers' efforts to replace human labor with automation technology. This is because the Law of Employment only limits the excuses for worker or labor efficiency when a company suffers sufficient losses, which can only be proven by an audit of the company's financial reports, so that termination of employment/*Pengakhiran hubungan kerja* (PHK) of workers or laborers can be carried out simultaneously in the context of transitioning to automation technology (Satriya & Basid, 2024). If the company only suffers a small loss, it can also carry out massive layoffs that are disproportionate in nature. Balancing restrictions need to be readjusted so that efficiency under Article 154A paragraph (1) of the Law of Employment is not abused. The author recommends that, in addition to being proven by an audit of the financial statements of the loss-making company, employers should also be required to conduct an automation impact assessment (AIA) before terminating employment. The results of the AIA should be used as the maximum limit on the number of workers and employees who can be terminated.

Table 2. Recommendations for strengthening labor laws

| Legal Problems | Recommendations |
|--|--|
| The bias inherent in the use of automation technology, such as AI, in the work recruitment and placement process has the potential to discriminate against the rights of workers and laborers to obtain equal opportunities and treatment (Articles 5 and 6 of the Law of Employment). | There needs to be a transparency obligation for companies through notification to workers and laborers that AI-based recruitment processes and selection results must include the reasons for rejection. Furthermore, prospective workers and laborers must be given the opportunity to submit objections to the results to the company, and these objections must be reviewed by humans (human intervention). |
| The provision of job training as a right for workers and laborers is limited to the improvement of skills and expertise relevant to their level, job qualifications, and field of work (Article 1 number 9 and Article 12 paragraph (3) of the Law of Employment). | Job training relevant to the position and field should be established as a minimum right for workers (upskilling), and job training should also cover irrelevant fields as long as they are necessary competencies in the labor market (reskilling). |
| There are no restrictions on the grounds for termination of employment for the purpose of corporate efficiency based on losses (Article 154A paragraph (1) letter b of the Law of Employment), including the replacement of workers and laborers with automation technology. | It is necessary to add restrictions on the grounds for termination of employment in the provisions with the obligation to conduct an automatization impact assessment (AIA). |

3.2 National talent mapping (NTM) as a solid foundation for guaranteeing workers' and laborers' rights

The wave of disruption caused by automation requires an integrated system capable of accurately mapping the impact on employment. However, Indonesia does not yet have a unified and integrated database for mapping, so policies are often misguided (Fachriansyah & Wulandari, 2022). For this reason, National Talent Mapping (NTM) is an important element in employment reform. NTM is an AI-based system designed to adaptively map and

analyze the competency profiles of workers, both those affected by automation and those who are not. This system not only functions as a data collector, but also as a tool to match worker competencies with industry needs in real time, in a system called Satu Data Ketenagakerjaan (One Employment Data) (Article 3 of Minister of Manpower Regulation Number 15 of 2020 concerning Single Employment Data).

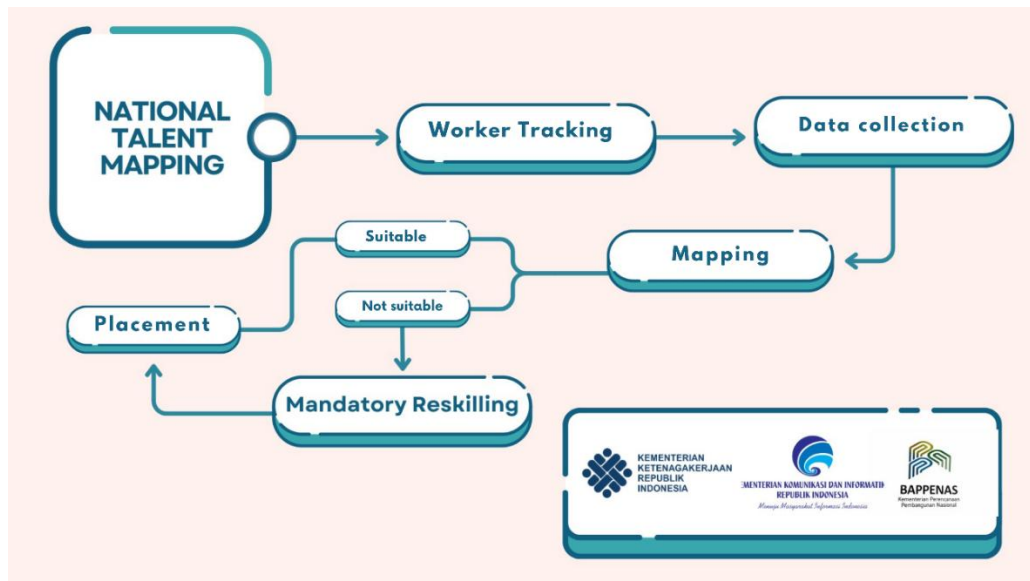


Fig. 4. National talent mapping concept

Conceptually, NTM can be understood through the perspective of human capital theory, which states that the workforce is a productive asset whose value can be increased through education, training, and experience (Kasmawati, 2017). In this case, workers who lose their jobs should not be seen as a burden, but rather as a resource that can be transferred to new fields according to industry needs. With NTM, the state is able to clearly map the capacity of workers and place them in more productive positions. This investment has an impact on human resources, emphasizing that every rupiah spent on skills improvement will contribute to national economic growth (Arifin, 2023).

However, in implementing NTM, the principle of equality before the law is very important. This implies that every worker, regardless of social and educational background, has equal right to access work that matches their competencies (Triwulandari, 2020). Through NTM, the state is responsible for ensuring that all workers, including those in vulnerable groups, have equal opportunities for development and receive fair protection in the face of major changes in the world of work.

When viewed from the perspective of the rule of law, the existence of the NTM can also be understood as the implementation of the principle of the rule of law, which guarantees certainty, justice, and benefit (Soewono, 2020). Accurate labor mapping will serve as a solid legal basis for the government to formulate labor regulations. Without valid data, the policies that are created are prone to being discriminatory or even detrimental to certain groups. For example, without a clear database, reskilling programs may only target certain industrial sectors and ignore other sectors that are equally affected by automation. With NTM, the policy formulation process becomes more transparent and evidence-based, so that the public can monitor and ensure that the principle of equality is truly implemented.

Furthermore, it is important to emphasize that NTM is not merely a matter of collecting technical data but also functions as a strategic policy instrument. With an integrated database, the government can see long-term employment trends, such as the shift in labor demand from labor-intensive sectors to technology-intensive sectors. This information will form the basis for designing vocational education curricula, job training programs, and national industrialization strategies. Without NTM, policies tend to be reactive and short-term, while the changes brought about by automation are rapid and massive. Therefore,

NTM can be seen as an early warning system that anticipates waves of unemployment due to skills mismatches.

A progressive legal perspective offers a framework for approaching labor issues in the era of automation. This theory emphasizes the need for laws to evolve with the times in order to accommodate the changing needs of society (Mahfud, 2013). Therefore, NTM should be seen not only as an administrative tool, but also as a means of formulating policies that are responsive to structural changes in the world of work. This concept is in line with the government's efforts to adopt labor policies that are more adaptive to technological developments, while remaining based on the principles of social justice and worker welfare.

Through the data provided by NTM, the resulting policies will be more targeted, especially for countries seeking to reduce the skills gap between the existing workforce and the increasingly competitive and technology-based job market. With accurate data from NTM, employment policies focused on social protection and social security for workers will be easier to implement. For example, through reskilling and upskilling programs based on NTM data, workers can be guided to acquire new skills that are in line with industry needs, so that they can remain competitive in a dynamic job market (Kresnadi & Narendra, 2023).

NTM also has the potential to become a means of cross-sector integration. The collected workforce competency data can be linked to industry data, education data, and even regional development data. This integration will make labor policies more contextual, as the needs of workers in each region are not always the same. For example, manufacturing industries require different skills than tourism or agriculture-based regions. With NTM, the government can develop more targeted reskilling and upskilling programs tailored to the economic characteristics of each region. This also reduces the risk of development disparities between regions due to automation.

If NTM is implemented properly, the legal action referred to can take the form of policies that provide justice for workers and fulfill the rights of workers affected by automation. Conversely, if NTM is not implemented according to the correct principles, for example, if the data collected is inaccurate or not used wisely, legal problems will arise, such as injustice in the distribution of employment opportunities or the neglect of workers' rights. Therefore, regulations related to data protection and worker privacy need to be regulated more specifically, with reference to existing legal principles.

On the other hand, the implementation of NTM must certainly take into account ethical aspects and the protection of workers' personal data. Competency data, work history, and educational records are sensitive information that, if not managed properly, can be misused by irresponsible parties. Therefore, in addition to strict data protection regulations, there must also be an independent monitoring mechanism to ensure that data is used only for employment purposes and not for commercial purposes. Transparency in data use must be guaranteed so that workers trust that their information will not become an additional burden, but rather a means to obtain better employment opportunities.

3.3 Mandatory reskilling as a strategy to improve workforce competence in facing technological disruption

During an era increasingly dominated by automation, Indonesia faces a major challenge in addressing the mismatch between workforce competencies and rapidly growing market needs. This situation is particularly concerning given that the majority of Indonesia's workforce still has low skills, while industries and companies increasingly demand higher skills that are relevant to the latest technological developments (Soepono et al., 2025). This problem has the potential to increase unemployment rates, given that many jobs are being lost due to automation and digitization.

Every wave of industrial revolution has always brought major changes to the structure of employment. Old jobs based on manual labor will increasingly be eroded, while new types of jobs will emerge with different skill requirements. If no serious efforts are made to adjust the competencies of the workforce, the gap between those who are able to adapt to technology and those who are left behind will widen (Suryadi & Nasution, 2023). One

solution offered to address this problem is through a Mandatory Reskilling program, which aims to improve workforce competencies in a sustainable and planned manner.

Mandatory Reskilling is a systematic effort to retrain the workforce so that they can acquire new skills relevant to the needs of industry in the technological era. According to the Cambridge Dictionary, reskilling is defined as the process of learning new skills that enable a person to do a different job. Meanwhile, upskilling refers to the process of updating existing skills to remain relevant to industry needs. This shows that improving skills through reskilling and upskilling programs can be very beneficial for individuals in adapting to job changes. These programs not only improve individual performance in their current positions but also increase their ability to transition to new positions that are more in line with industry developments.

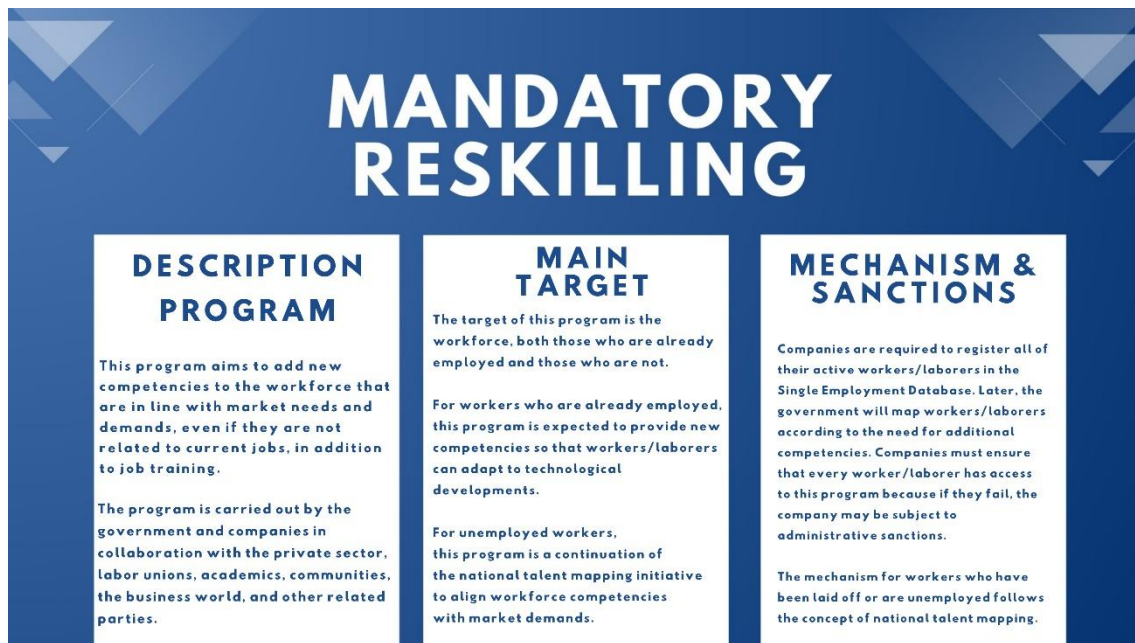


Fig. 5. Mandatory reskilling concept

Both are very important in the era of Industry 4.0, which is forcing changes in the world of work, where many conventional jobs are being replaced by machines and automation technology. Jobs that once required manual skills are now a waste of resources, and new jobs require more complex and technology-based skills. Thus, reskilling and upskilling also increases overall company productivity, help sales and marketing become more responsive to customers and ever-changing markets, and enable employees to work more flexibly in the face of emerging challenges.

If the workforce is unable to adapt to technological developments, the balance in society will be disrupted. High unemployment rates can trigger other social problems such as increased poverty and vulnerability to conflict. Through reskilling, workers can continue to play a productive role amid change, thereby maintaining social stability. This program not only benefits individuals but also serves to maintain social harmony amid rapid and often unpredictable changes.

In addition, this training program can also help companies reduce recruitment costs because, in essence, the costs incurred by companies when recruiting and training new employees will be much higher than reskilling or upskilling existing employees. In this case, the program can certainly reduce recruitment expenses and accelerate the transition to new technologies in the workplace. These long-term cost savings will be very beneficial for companies, as they can retain skilled and loyal workers while increasing their competitiveness in an increasingly technology-based global market.

This program is not only intended for those who are unemployed, but also for workers who are currently active in the industry. The implementation of reskilling for active workers

is carried out periodically with a focus on developing competencies that are in line with the latest technology trends. On the other hand, for those who are currently unemployed, this program serves as a continuation of the NTM to provide new and more relevant skills, thereby increasing their chances of being re-employed in the labor market. Through this retraining, workers will be equipped with the skills required by the ever-evolving industrial sector.

This program is implemented inclusively, involving various parties ranging from the government and private companies to other stakeholders who play a role in creating an adaptive and sustainable employment ecosystem. The government has a central role in initiating policies and providing incentives for companies to hold reskilling and upskilling training programs. Mandatory retraining is also closely related to the commitment to sustainable development. Economic growth will not be truly inclusive if most of the workforce is left behind because they lack new skills. Through mandatory reskilling, the benefits of technology can be felt more evenly, not just by capital owners. Thus, this program becomes an important bridge to ensure that industrial development does not sacrifice social welfare but rather promotes decent work for all.

3.4 Targeted tax automation

The implementation of targeted automation tax is a form of fiscal policy adaptation in response to technological developments that have the potential to cause social injustice in the world of work. The presence of machines and artificial intelligence systems does bring efficiency to companies, but at the same time displaces human workers from the production chain. This situation creates a concentration of economic added value only for capital owners, while workers who lose their jobs often do not receive adequate compensation (Ooi & Glendon, 2018). In this context, targeted automation tax serves as an instrument to maintain balance, so that technological transformation continues to take into account humanity and workers' rights. This tax is not solely intended to increase state revenue, but also serves as a control mechanism to encourage companies to be more prudent in adopting automation.



Fig. 6. Targeted automation tax

The implementation of automation tax can also be seen as a preventive measure to avoid broader structural inequality. If automation is left unchecked, it will lead to what is known as labor market polarization, a condition where only high- and low-skilled jobs survive, while middle-skilled jobs disappear because they are replaced by machines (Davis et al., 2020). Without fiscal policies that can compensate for this, the social gap will widen,

as middle-skilled workers constitute most of the workforce in Indonesia. Therefore, a targeted automation tax is an appropriate intervention to ensure that the impact of technological disruption does not further worsen labor market conditions.

The concept of a targeted automation tax works on a similar principle to a carbon tax, whereby companies are subject to a fiscal burden in accordance with the consequences they cause (Ihsan & Hutama, 2023). If a carbon tax measures greenhouse gas emissions, then an automation tax measures the social impact of the rate of replacement of human labor. The greater the proportion of workers replaced by automated systems, the higher the tax imposed. This scheme encourages companies to make careful calculations before deciding to replace workers, because there is a financial burden to bear if this step is taken excessively. Thus, this tax encourages companies to balance the use of machines with the need to retain human workers.

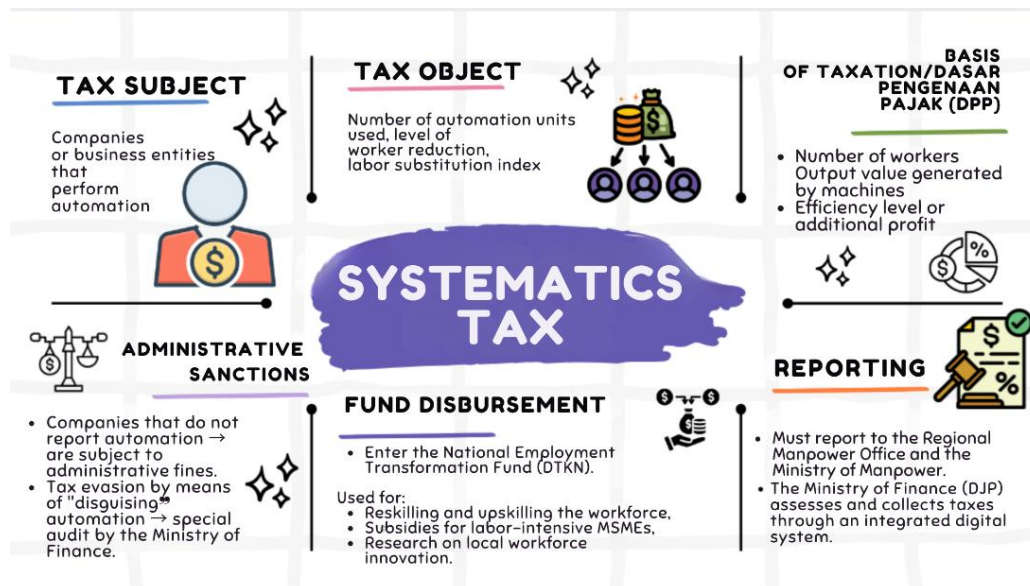


Fig. 7. Targeted automation tax system

In addition to providing a controlling effect, the automation tax system also emphasizes that companies can no longer focus solely on short-term profits. With the automation audit mechanism in place, companies are encouraged to reconsider their business strategies in a more balanced manner. In this framework, the efficiency generated by machines should not come at the expense of workers' rights, but must be accompanied by social investments that can improve the quality of human resources.

The systematic collection of automation taxes is carried out through several interrelated stages. First, the government and relevant institutions identify and audit the impact of automation in a company. This audit will measure the proportion of workers who are replaced, either directly by machines or through artificial intelligence-based systems. The results of the audit then form the basis for calculating the tax rate to be imposed. Second, the tax rate is set progressively. This means that the higher the level of automation, the greater the percentage of tax imposed. This progressive scheme ensures fairness, as the greatest burden is placed on companies with the most significant impact on job losses.

Furthermore, the tax funds collected from companies do not merge into the state's general revenue but are placed in a clearly marked special account. This earmarking is important so that the original purpose of the tax is truly achieved, namely, to protect workers affected by automation. The funds are directed towards financing reskilling and upskilling programs so that workers have new competencies relevant to industry needs. In addition, the funds can also be used for temporary social security for workers who lose their jobs, so that they still have livelihood protection during the transition period. Through this mechanism, the automation tax is not only a burden on companies, but also a bridge for workers to enter the new industrial era in a more inclusive manner.

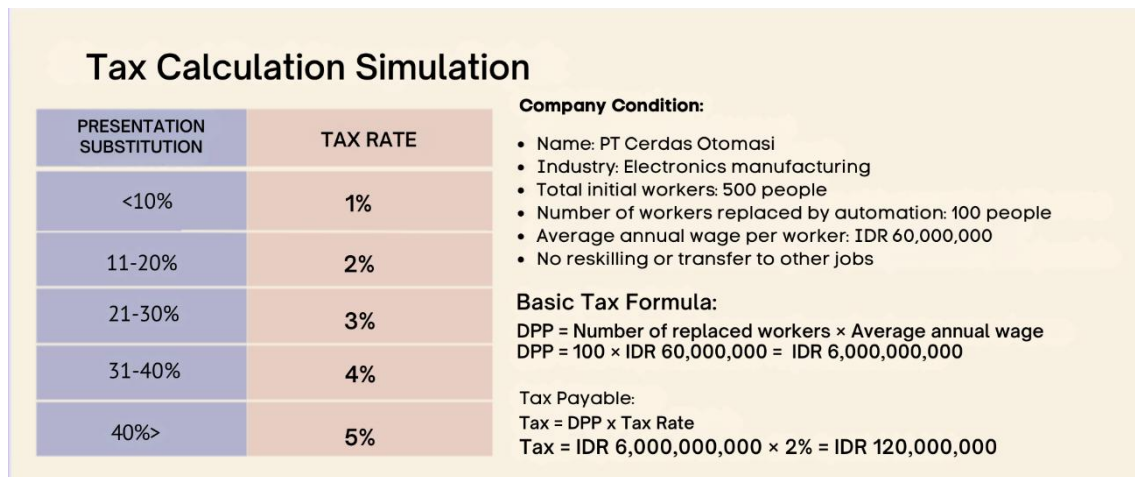


Fig. 8. Tax calculation simulation

The simulation model also shows that automation tax is not intended to hinder technological progress, but rather to regulate its use. Companies are still allowed to innovate, but must bear the social consequences of doing so. With this scheme, automation can actually become a driver for the creation of a fairer work ecosystem. Companies will be encouraged to find a balance between the use of technology and workforce empowerment, while the state obtains a clear instrument for channeling social protection funds. This is different from the general tax system, because automation tax is earmarked, so its impact is more directly felt by workers.

A simple simulation can provide a concrete picture of how this tax works. For example, a manufacturing company that replaces 20% of its workforce with automated machines will be subject to a higher tax rate than a company that only replaces 5%. If the company's net profit reaches one hundred billion rupiah and the level of automation is in the middle category, then the percentage of automation tax imposed could reach four percent of net profit, or around four billion rupiah. These funds are then distributed to finance retraining for affected workers, social security subsidies, and support for vocational education. With this model, companies can still achieve efficiency through automation, but without neglecting their social responsibility towards their workers.

From an economic perspective, a targeted automation tax has two effects. On the one hand, this policy increases state revenue, which is specifically used to protect the workforce. On the other hand, this tax provides incentives for companies to implement automation selectively and gradually. This allows companies to continue to pursue efficiency, but with more careful consideration and not solely for short-term profits. Meanwhile, from a social perspective, the automation tax serves as a safety net to prevent workers from being marginalized by technological advances. Affected workers still can retrain, acquire new skills, and re-enter the competitive job market.

However, the implementation of this tax is not without challenges. Resistance from employers may arise, as this policy is seen as adding to operational costs. In addition, government oversight is an important factor, as the level of automation in a company is not always easy to measure transparently. To address these challenges, the government can integrate the National Talent Mapping system as an official database on employment conditions and the impact of automation. With accurate data, the government can determine fair tax rates and prevent manipulation by companies. On the other hand, the government also needs to provide fiscal incentives for companies that maintain a proportion of human workers, so that this policy feels balanced.

In the long term, the success of implementing targeted automation taxes depends heavily on collaboration between the government, business actors, and labor unions. The government needs a strong commitment to creating regulations that are clear, transparent, and adaptive to technological developments. Meanwhile, business actors must realize that

investing in social protection and workforce skills is part of corporate responsibility, not merely a legal obligation. On the other hand, labor unions have a strategic role in ensuring that workers' voices are represented in every policy formulation process. The collaboration between these three actors will determine whether automation tax can be a real solution or will instead add to the polemic in the industrial world.

4. Conclusions

Based on the above discussion, it can be concluded that Indonesian labor laws are no longer effective in dealing with the impact of technological automation in the Society 5.0 era, which requires workers to have high skills, while the condition of the Indonesian workforce is the opposite. The AERISTA concept can be a solution to deal with these circumstances by adopting it into the reconstruction of Indonesian labor laws.

AERISTA is based on four main pillars that emphasize collaboration among all relevant stakeholders. The first pillar is the strengthening of policies on problematic and ineffective regulations so that labor laws can function optimally in the current situation. NTM is the second pillar, which is an AI-based integrated system to manage the risks of automation technology in the field of labor. The third pillar is mandatory reskilling as an incentive for workers to adapt and acquire new competitive skills. The fourth pillar is Targeted Automation Tax as a means of controlling the substitution of human labor with automation technology in a measurable manner and as a source of social protection funds for workers.

With the implementation of these four pillars, AERISTA not only functions as a normative concept but also as a concrete implementation framework to address the challenges of labor transformation. The policy strengthening pillar will provide legal certainty while narrowing the gap for regulatory abuse, while NTM acts as an adaptive roadmap to identify the skills needed by industry in the future. Mandatory reskilling programs are an effective means of bridging the widening skills gap, ensuring that workers affected by automation remain competitive in the labor market. Targeted automation taxes then become a fiscal instrument that ensures social justice, while guaranteeing that corporate efficiency is balanced with worker protection.

Furthermore, the existence of AERISTA will create a sustainable employment ecosystem by positioning workers not as victims of automation, but as an important part of the transformation process itself. Cross-sector collaboration, involving the government, business actors, labor unions, and educational institutions, will be key to the successful implementation of this concept. If formulated seriously within a positive legal framework, AERISTA can fill regulatory gaps and address workers' concerns in the era of technological disruption. Therefore, the government is recommended to immediately reconstruct labor laws based on AERISTA to create inclusive, adaptive, and collaborative labor laws towards the era of Society 5.0.

Acknowledgement

The authors would like to express sincere gratitude to the Faculty of Law, Universitas Brawijaya, and the National Law Week organized by Sebelas Maret University for the facilities provided during the writing of this paper, which enabled its publication.

Author Contribution

The authors is solely responsible for all ideas and concepts, including the simulation methodology in the idea scheme and manuscript preparation.

Funding

This research did not use external funding.

Ethical Review Board Statement

Not available.

Informed Consent Statement

Not available.

Data Availability Statement

Not available.

Conflicts of Interest

The authors declare no conflict of interest.

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