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The Impact Of Automation And Artificial Intelligence On Workplace Injuries And The Future Of Workers' Compensation Laws: A Techno-Legal Analysis

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Abstract

The high rate of artificial intelligence and automation is also considerably altering work-related safety systems and workers compensation systems in most industries. The AI technologies, like predictive analytics, real-time monitoring, wearable devices, and robotics, are increasingly applied in detecting risks at the workplace, preventing injuries, and enhancing the occupation safety management. Nevertheless, as much as the technologies help in minimizing injuries in workplaces, they present new legal and compensation dilemmas, such as how AI-related injuries are to be liable, how to safeguard worker privacy in AI surveillance technologies, how to ensure that AI algorithms are free of bias and how to control the use of AI generated evidence in compensation claims. The paper will discuss effects of artificial intelligence and automation in workplace injuries and shall give a view whether the current workers compensation laws are sufficient to deal with the legal and compensation challenges in AI driven workplaces. The paper also discusses how the workplace should have reforms in compensation legislation, insurance designs, and the liability forms that are responsive to the technological changes in the work place. To sum up, the paper will find that the future of workplace injury compensation needs a holistic, transparent, and equitable techno-legal compensation system to provide worker protection and encourage technological innovation.

Introduction

2.1. Background of the Study.

The current world is changing its working environment due to the fast development of artificial intelligence (AI) and automation. The manufacturing, construction, transportation, healthcare, and logistics are some of the industries that are currently using AI-based applications to enhance the safety and efficiency of the workplace by implementing predictive analytics, robotics, wearable safety measures, and real-time monitoring systems. The technologies aid in detecting the possible hazards, checking the health and fatigue of the workers, and avoiding accidents even before they can occur. This is causing a shift in the management of safety in the workplace, moving away the reactive approach that seeks to compensate when the situation has already been unfortunate and moves towards the proactive approach which tries to address the issue of preventing injuries and predicting the risks.

AI is useful in work-related injuries prevention through analyzing extensive amounts of data to detect the patterns of risk and predict potential accidents. The movement, posture and fatigue level of workers can be tracked by a wearable device and the hazardous jobs can be accomplished by automated machines and robots as opposed to putting workers in a high-risk work environment. These innovations can lessen injuries in the workplaces, enhance work productivity, and develop a safer workplace.

Nevertheless, the use of AI and automation is also increasing, thereby generating additional legal and compensation issues. The traditional laws on worker compensation were formulated when workplace injuries were mostly due to human factor or unsuitable working environments. In the autonomous workplace, accidents can be incurred by autonomous machines, algorithm failures, human/AI interface, and system malfunctions. This leads to a misunderstanding of legal liability, the duty of the employer and the right to receive compensation.

2.2 Statement of the Problem.

Introduction of artificial intelligence and automation to safety systems in work places has presented an intricate legal problem that current legislation on the area of workers compensation is not adequately equipped to handle. Although AI helps to decrease the number of injuries at the workplace due to predictive risk-related policies and automation of hazardous jobs, it also causes new formulations of risks, including machine malfunctioning, inaccurate algorithmic decision-making, breach of data privacy, and the problem of workplace surveillance.

Among the key issues, there is the problem of liability of the injuries at work which is related to AI. Once an autonomous robot or an AI-controlled system inflicts harm on someone, there is no clear line between the employer, the machine manufacturer, the developer of the software, or the worker, with regard to who is legally liable. As AI-based workplaces have multiple actors, the traditional compensation laws are founded on the employer liability, yet they become more complicated to determine.

The second significant problem is that AI-generated data could be used as evidence during the workers compensation claims. The information that can be gathered by AI systems when employees are at work include sensors, cameras, and wearable devices, which can be utilized to evaluate compensation claims. Nonetheless, the application of these data attracts the issues of privacy of workers, worker surveillance, data ownership, and algorithm bias. It is also possible that automated compensation systems will fail to provide fair or unfair decisions to people unless they are regulated accordingly.

Thus, the issue is that technological advancement is growing much faster than legal frameworks and compensation laws, which means that the technological progress is being made at a pace at which the legal protection of the workers is lagging.

2.3 Research Gap

The majority of available literature is dedicated to the application of artificial intelligence and automation in enhancing workplace safety and minimizing workplace injuries. Most of the research speaks about predictive analytics, robotics, and wearable technologies being used as prevention and risk management tools in regards to injury prevention. Nevertheless, not many studies are investigated on how the artificial intelligence is transforming the framework of the workers compensation, the model of insurance, and the framework of legal liability.

The research on the modification of compensation legislation according to autonomous-system-caused injuries, the status of the AI-generated evidence in compensation suits, and the protection of worker rights in AI-observable workplaces has little research. It is also unavailable that there is a clear techno-legal framework that incorporates artificial intelligence, control of workplace safety, and workers compensation law.

The proposed study is an attempt to fill this research gap and to discuss both the technological and legal dimensions of the increase of workplace safety through artificial intelligence and how the laws of worker compensation need to change in response to new threats posed by artificial intelligence and automation.

2.4 Purposes of the Study.

This research has the following primary purposes:

1.To review how artificial intelligence and automation help in preventing injuries at the workplace.

2.In order to examine the influence of AI technologies on the workplace safety and risk evaluation.

3.To analyze the legal issues that AI has in employee compensation systems, such as liability, privacy, and evidence produced by AI.

4.To assess whether current workers compensation legislation is sufficient to deal with the issue of AI-related occupational injuries.

5.To present the proposal of techno-legal framework to enhance work compensation within the AI-based working environments.

2.5 Research Questions

In this study, the following research questions are followed:

1.What is the role of artificial intelligence in avoiding occupational accidents?

2.What are some of the new forms of workplace risks that automation and AI systems bring?

3.How does AI-based workplaces pose any legal problems to workers compensation laws?

4.What is to be done with liability in cases of human-AI interaction and autonomous systems?

5.How do you change the workers compensation laws to deal with AI-related job injuries?

2.6 Hypothesis

The following hypotheses are used to base the study:

H1: Workplace injuries can be minimized by artificial intelligence and automation which can predict injuries

and risks using predictive analytics and risk management systems.

H2: The current workers compensation policies are ineffective in dealing with AI-related work-related injuries and liabilities.

H3: The techno-legal compensation framework is necessary to control the work-related injuries in the sphere of AI and provide the protection of workers.

The study will focus on exploring the methods by which the specified theory can be applied within the workplace environment.<|human|>2.7 Scope of the Study The research paper is going to have a focus on investigating the ways in which the given theory could be utilised in the workplace setting.

In this research, the authors are concerned with the presence of artificial intelligence and automation on work-related injuries and laws on workers compensation. The AI technologies included in the study include predictive analytics, wearable safety devices, robotics, and real-time monitoring systems applied in the workplace safety management. Legal matters associated with liability, workers, privacy, and compensation claims in the workplaces that are AI-oriented are also studied. This study will be restricted to secondary data sources including journal articles, industry reports, and legal studies published in the years 2020 and 2025.

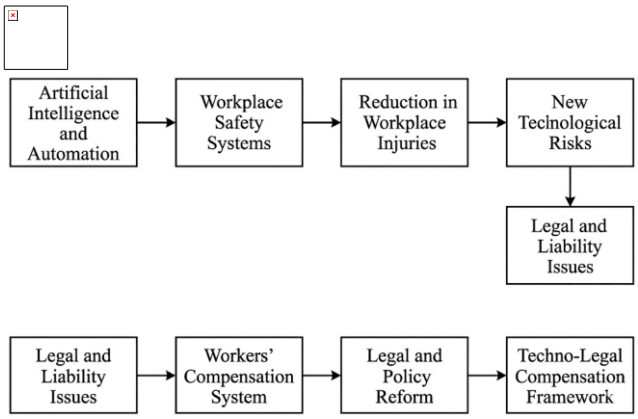
2.8 Limitations of the Study.

There are some limitations of this study. To begin with, legal systems are in transition, and the technology of artificial intelligence is progressing fast, thus the research will focus on existing legal regulations and technologies. Second, the case law regarding AI-related workplace injuries has few cases in it, thus complicating legal analysis. Third, the research is founded on literature review and secondary data, and hence is not accompanied by primary empirical research. Lastly, the workers compensation systems may vary across countries, and thus there is a possibility that the results are not applicable globally.

3.CONCEPTUAL FRAMEWORK

3.1.1 Artificial Intelligence and Workplace Safety.

Safety systems have changed greatly at the workplace under the influence of AI and automation since it has brought about a predictive and preventative safety system. The conventional workplace safety systems were rather reactive, i.e. safety measures were provided after accidents had taken place. But as the generation of artificial intelligence technologies including predictive analytics, wearable safety devices, real-time monitoring, robotics, etc. has taken hold of the workplace, safety has no longer been reactive but has become proactive and preventative.



The artificial intelligence assists in detecting risks on workplace, forecasting what might occur in accidents, monitoring the health condition and fatigue of workers, as well as automating risky tasks. Predictive analytics involves using past and current data to determine the patterns of risks at the workplace and anticipate potential injuries before they strike. Wearable gadgets track the movements of workers, their posture, and physical ailments that assist in avoiding ergonomic injuries and accidents caused by fatigue. The robotics and automation decrease human intervention in dangerous activities like heavy lifting, chemical work and unsafe manufacturing procedures.

Thus, AI would be essential in preventing occupational injuries, enhancing workplace safety, and developing working conditions that are safer. Nonetheless, although AI increases the safety at work, it also provides the technological and legal issues requiring correction by means of appropriate legal and compensation systems.

3.2 AI-Related Problems and Novel forms of workplace injuries.

Though artificial intelligence helps in reducing the number of traditional workplace injuries, it also leads to newer forms of risks and injury that were uncommon to the traditional workplaces. Those risks can be described as a result of human-AI interaction, the malfunction of robots, algorithms errors, systems failure, and excessive dependency on automated systems. To illustrate, the injuries can happen as a result of faulty robots, inaccurate AI judgment, inaccurate automated safety systems, or a failure in AI-based risk assessment systems.

A second significant issue is the issue of surveillance at work and privacy. Monitoring systems that are based on AI gather much information in the form of cameras, sensors, and wearable devices. Although such information is beneficial in enhancing the safety of the workplace, it brings about the issue of worker privacy, safeguarding of information as well as abuse of personal data. Constant surveillance can also be psychologically stressing to workers, and thus can impact on worker welfare and the working environment.

These emerging risks demonstrate that artificial intelligence is not only minimizing occupational trauma and injuries in the workplace but it also brings in technological, ethical, and legal dangers. That is why, proper legal regulations and safety standards should be elaborated in order to control AI-related risks in workplace and respect the right of workers.

3.3 Legal Liabilities and Compensation Problems.

Artificial intelligence and automation at workplaces present some legal concerns, especially liability and workers compensation. In conventional laws of workers compensation, the liability depends on the employer, that is, he or she is expected to compensate a worker in case of a worker being injured at the course of his or her employment. Nonetheless, injuries can be inflicted by autonomous machines, software failures or through human-AI interplay in the AI-driven workplaces leaving it hard to know who holds legal responsibility in the hurt.

When a workplace is affected by AI-related injuries, a number of liabilities might be involved including: the employer, the manufacturer of the machine, the developer of the software, the operator of the system and the insurance company. This poses legal complexity as the common laws around compensation were not created to take into consideration any harm created by intelligent machines or automated systems.

The other significant issue is the application of the data generated by AI to be used as evidence in compensation claims. AI systems gather data about workplaces with sensors, wearable, and surveillance systems, and this data can be utilized to identify the claim of compensation. Nevertheless, applying AI-generated evidence presents the problem of accuracy of data, bias in the algorithm, transparency, and equity in compensation. The automated compensation systems could cause wrong claims and deprivation of worker rights in case the AI systems are not regulated.

Hence, legal liability regulations and laws on workers compensation should be modified to accommodate AI-related work-related injuries and compensations as artificial intelligence is integrated into work-related safety systems.

3.4.Technology-Legal Compensation System

The paper suggests a techno-legal compensation system that incorporates the artificial intelligence, legal regulation, and workers compensation system. The basis of the framework is that AI application in the workplace injury prevention is not to be limited to its application and regulation in compensation systems and legal ruling processes.

Following this framework, risk assessment, prediction of injuries, monitoring workers, and processing their compensation claims can be considered under artificial intelligence. Nevertheless, the regulation should be performed through law to promote transparency, accountability, and justice in AI-driven decision-making. The framework further focuses on the need to safeguard the rights of workers such as the right to privacy, the right to fair pay, and the right to appeal against automated decisions.

The techno-legal compensation framework indicates that the prospective workers-compensation system will turn into a hybrid system, which will integrate the use of artificial intelligence technology, legal regulations, insurance plans, and human control. The use of artificial intelligence can enhance efficiency and speed when dealing with compensation claims, but human oversight and legal control are needed to avoid the chance of algorithmic bias and compensatory fairness.

Therefore, the conceptual framework of this study shows that artificial intelligence, workplace safety systems, legal liability, and workers' compensation systems are interconnected, and the future of workplace injury compensation depends on the development of an integrated techno-legal framework that balances technological innovation with worker protection and legal accountability.

4.RESEARCH METHODOLOGY

4.1 Research Design

The present research employs a qualitative systematic literature review as the type of research design to be used in the study to address the effect of artificial intelligence and automation on workplace injuries and workers compensation laws. A systematic literature review is a process where the literature, legal reports, and industry studies that exist are obtained, revised, and analyzed systematically and organizationally. This research design is suitable since the research is aimed at analyzing the law, policy problems, and changes in technology, but not statistics. The systematic review approach is useful in determining patterns, themes and gaps in the current literature concerning AI-based safety, legal liability, and compensation systems used at work. It is also useful in creating an idea-based comprehension of the way artificial intelligence is altering the workplace injury prevention and compensation models.

4.2 Research Approach

The study applies a qualitative research design in the examination of the legal, technological, and policy ramifications of artificial intelligence in workers compensation and safety in the workplace. The qualitative approach would be appropriate in this research since it is the one that deals with the comprehension of law, liability, rights of the worker, ethical aspects, and policy reforms of artificial intelligence and automation. The application of this method will enable the researcher to identify the complex relationship between technology, law, and compensation systems and come up with a techno-legal framework of compensation systems in the future. The qualitative approach plays its role especially in this study given that the research is done based on legal analysis, conceptual models, and thematic interpretation as opposed to numerical or statistical analysis.

4.3 Data Sources

This research will be founded on secondary data gathered in the databases of academic and research, legal reports, and industry publications. The primary data gathering tools are Google scholar, Scopus, PubMed, industry reports and legal reports. It was decided to use these sources as they cover the information on artificial intelligence, workplace safety, automation, and legal liability and workers compensation laws, which is reliable and recent. The literature sources of the research are mostly written in 2020-25 to make sure the research can reflect the latest technological and legal trends. The review of journal articles, research articles, policy documents, and legal analyses was done to get the idea of how artificial intelligence influences work-related injuries and compensation models.

4.4 Inclusion and Exclusion Criteria

To make sure that only relevant and reliable studies were included in the research, selective inclusion and exclusion criteria were used when the literature review process was carried out. The inclusion criteria were to include articles connected to artificial intelligence and safety in the workplace, automation and occupational injuries, compensation legislation, legal responsibility, and artificial intelligence ethics and privacy. The sample of the research was limited to peer-reviewed journal articles, legal reports, and industry reports published from 2020 to 2025 and in English. The exclusion criteria were: the studies that did not pertain to artificial intelligence or workplace safety, previous studies that were published prior to 2020, articles not published by the academia (blogs and opinion pieces), and studies that did not address the legal or compensation-related concern. These were used to narrow the focus on selecting the relevant literature as well as keeping the research quality and reliability.

4.5 Method of Data Analysis.

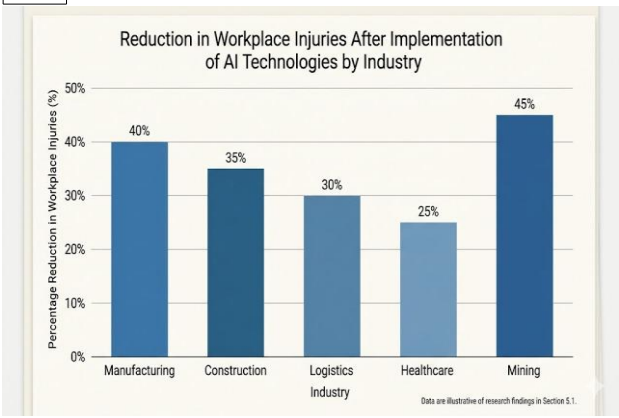
The thematic analysis was also applied in analyzing the data gathered through different resources, which is a qualitative tool applied in determining shared themes and patterns in the literature chosen. Thematic analysis was applied in this research to identify such key themes as AI-motivated injury prevention in the workplace, AI-related risks in the workplace, legal liability, and ethical considerations, and workers-compensation law concerns. The thematic analysis process implied conducting a review of the sampled studies, offering the review of the identification of critical concepts and common themes, sorting similar ideas into groups, and discussing the results in accordance with the research objectives. The thematic analysis technique assisted in the arrangement of the research outcomes and comprehension of the linkage between artificial intelligence, workforce safety, judicial responsibility, and employees compensation schemes.

5.FINDINGS and ANALYSIS

5.1 Workplace Injury Prevention: Artificial Intelligence.

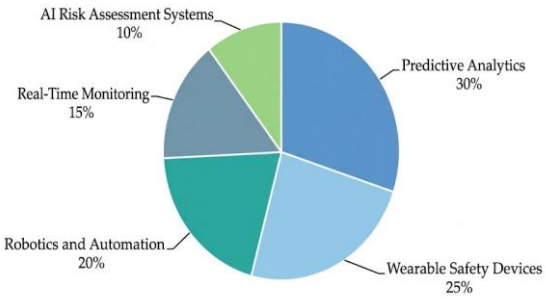
The results of this analysis show that artificial intelligence and automation have played significant roles in enhancing the workplace safety and minimizing the number of injuries in the workplace. The use of predictive analytics, wearable safety devices, real-time

monitoring systems, and robotics are examples of AI-driven technologies that are more prevalent in modern workplaces and are aimed at pointing out the possible hazards and preventing accidents before they happen. Predictive analytics machines use past and current mass data at the workplace to detect trends of the risks and forecast potential injuries in the workplace. This enables organizations to have preventive strategies even before accidents are experienced and hence the workplace injury rates are minimized.



Sensor based monitoring system and wearable safety gadgets are also contributing relevantly in the occupational health and safety management. These gadgets track the mobility, postures, fatigue intensity, heart rate, and environmental conditions of workers which can be used to avoid ergonomic injuries, accidents caused by fatigue, and occupational exposure to dangerous conditions. Moreover, robotics and automation minimize worker availability to risky activities that include heavy lifting, risky production activities, mining activities, and dealing with chemicals.

Figure 1: Distribution of Artificial Intelligence Technologies in Workplace Safety

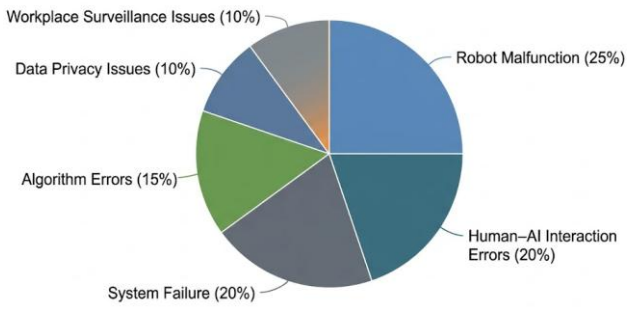


The results hence indicate that AI is changing the concept of workplace safety into a more responsive model to a proactive and preventive model. This change has significant implications to the system of workers compensation since in case occupational injuries have decreased by AI technology, the system of compensation and insurance models also requires a reorganization.

5.2 AI-Based Risk and New Workplace Problems.

Although the advantages of artificial intelligence in a work environment are extremely high, as the results of the current study demonstrate, AI and automation also bring with them novel forms of workplace risks and challenges. The risk of injury due to malfunction of the robots, system malfunctions and the error of the human-AI interaction are one of the largest risks observed. These kinds of injuries are not similar to the conventional work-related injuries as they are not due to human carelessness, but due to technological mechanisms.

Figure X. Breakdown of AI-Related Workplace Risks



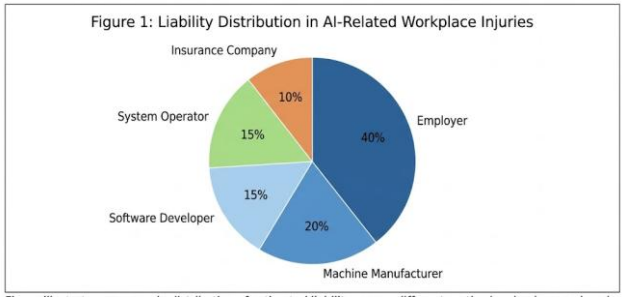
Note: Data illustrates distribution of self-reported or perceived risks. Percentages sum to 100%.

The other significant problem referred to in the research is the ethical and privacy aspects related to AI monitoring systems at the workplace. Artificial intelligence systems operate large quantities of data in the form of cameras, sensors, biometric devices, and wearables that can be used to track safety in the workplace and worker productivity. Although such data can be used to make the workplace safer, it also creates significant issues with regard to privacy of workers and data security, as well as monitoring of the workplace.

5.3. Legal Liability and Compensation Problems.

This research reveals that artificial intelligence has posed one of the hardest dilemmas in the work setting in the form of legal liability and compensation of workers. The customary laws of workers compensation are founded on the employer liability, whereas with the AI-related work-related injuries, many parties can be held liable, and the parties include the employer, machine

manufacturer, software developer, system operator and insurance company. This poses a complicated liability system since the conventional compensation statutes were not meant to tackle the injuries used by intelligent machines and automated systems.



The other significant question raised during the research is that AI-generated data should be used as an evidence in workers compensation claims. The AIs can collect data on the workplace via sensors, wearable devices and monitoring equipment and this information can be utilized to find out whether an employee is deserving of the payment or not. Nevertheless, the application of AI evidence also implicates legal considerations about the reliability of data, algorithmic discrimination, transparency, and justice when making decisions.

5.4 Requirement of Legal and Policy Reforms.

This research shows that the available legal practices and workers compensation regulations are not adequately equipped to solve the issues posed by artificial intelligence and automation at the workplace. The research proposes legal and policy changes to tackle the problems, including the liability, compensation claims, privacy of workers and application of artificial intelligence as a compensation making mechanism. The legislation must explicitly outline how AI-related injuries at the workplace should be treated and need to have regulations that govern how AI-based evidence should be used to settle a compensation claim. Data protection laws should also be developed to ensure that workers do not have to worry about the overuse of personal data collected by AI monitoring systems and unjustifiable control over them.

The article also recommends the workers compensation systems to embrace artificial intelligence in order to process claims faster, assess risks, and calculate compensation. Nevertheless, AI-based compensation systems should allow human control to avoid the AI being biased and to make reasonable compensation decisions. Thus, the future of injury compensation in the workplace lies in the creation of a techno-legal system that combines artificial intelligence, legal regulations, and workers compensation system.

6. Discussion

The findings of this study show that artificial intelligence and automation are transforming workplace safety, legal liability, and workers' compensation systems. The relationship between technology, law, and compensation is complex because while artificial intelligence reduces workplace injuries, it also creates new legal and compensation challenges. Artificial intelligence technologies such as predictive analytics, wearable safety devices, robotics, and automated claims systems are changing the way workplace safety and compensation systems operate. However, existing legal frameworks and compensation laws are not fully prepared to deal with these technological changes.

One of the major findings of the study is that predictive artificial intelligence systems help in risk calculation and injury prevention, but they also create legal issues related to liability. If an AI system fails to predict a risk or makes an incorrect decision, it becomes difficult to determine who is legally responsible for the injury. This creates challenges in workers' compensation because compensation systems depend on liability determination and risk assessment. Therefore, predictive AI not only affects workplace safety but also affects compensation calculation and legal responsibility.

Wearable safety devices and real-time monitoring systems improve workplace safety by collecting data on worker health, movement, and workplace conditions. This data can be used as evidence in workers' compensation claims to determine whether a worker is eligible for compensation. However, the use of wearable technology also raises legal issues related to worker privacy and data protection. Continuous monitoring may violate worker privacy rights, and there must be legal regulation regarding how this data is collected and used in compensation claims.

Robotics and automation reduce worker exposure to dangerous tasks, which reduces workplace injuries. However, when injuries are caused by robots or automated machines, the issue of machine liability arises. In such cases, it becomes difficult to determine whether the employer, the machine manufacturer, or the software developer is responsible for compensation. Traditional workers' compensation laws are based on employer liability, but AI-driven workplaces require a new liability framework that includes machine liability and shared liability among multiple parties.

Another important issue identified in the study is that automation reduces workplace injuries, which may lead

to changes in insurance and compensation models. Workers' compensation systems are based on workplace injury rates, and if injury rates decrease due to automation, insurance models and compensation structures may change. This may create challenges in determining compensation eligibility and insurance premiums in automated workplaces.

The use of artificial intelligence in compensation claim processing also creates new challenges. AI-based claims systems can process compensation claims faster and more efficiently, but algorithmic decision-making may create issues related to fairness, transparency, and accountability. If compensation decisions are made by automated systems, there is a risk of algorithmic bias and unfair claim rejection. Therefore, there must be human oversight in AI-based compensation systems to ensure fairness and protect worker rights.

The discussion of this study shows that artificial intelligence reduces workplace injuries but also complicates legal and compensation systems. Technology is developing faster than the law, and while artificial intelligence is proactive and predictive, the legal system is reactive and slow to adapt. This creates a gap between technological development and legal regulation. Therefore, workers' compensation systems must be reformed to address AI-related workplace injuries, liability issues, and automated compensation systems.

The study therefore argues that the future of workplace safety and compensation depends on the development of a techno-legal framework that integrates artificial intelligence, legal regulation, and workers' compensation systems. This framework should ensure that artificial intelligence is used to improve workplace safety and compensation efficiency while also protecting worker rights, privacy, and legal accountability.

7.IMPLICATIONS AND RECOMMENDATIONS

7.1 Legal Reforms Needed

The findings of this study indicate that significant legal reforms are required to address the challenges created by artificial intelligence and automation in workplace safety and workers' compensation systems. One of the most important reforms required is the development of clear legal rules regarding liability in AI-related workplace injuries. Since workplace injuries in automated environments may be caused by autonomous machines, software errors, or human–AI interaction, the law must clearly define the liability of employers, machine manufacturers, software developers, and system operators. Without clear liability rules, workers may face difficulties in receiving compensation for AI-related workplace injuries.

Another important reform is the development of legal rules regarding the use of AI-generated evidence in workers' compensation claims. AI systems collect workplace data through sensors, wearable devices, and monitoring systems, and this data may be used to determine compensation claims. However, there must be legal standards to ensure that AI-generated evidence is accurate, transparent, and free from algorithmic bias. The law should also ensure that workers have the right to challenge AI-based decisions.

The study also highlights the need for strong worker data protection laws to regulate workplace surveillance and data collection through artificial intelligence systems. AI monitoring systems collect personal and biometric data of workers, and therefore privacy laws must ensure that worker data is collected and used only for safety purposes and not for unfair monitoring or discrimination. Finally, there is a need for AI safety regulation to ensure that artificial intelligence systems used in workplaces meet safety standards and do not create risks for workers.

7.2 Changes in Workers' Compensation System

The study suggests that workers' compensation systems must be modernized to adapt to artificial intelligence and automation in workplaces. One of the major changes required is the introduction of AI-based claims assessment systems that can process compensation claims more efficiently and reduce delays in compensation payments. Artificial intelligence can be used to analyze workplace data, injury reports, and medical records to assist in compensation claim assessment.

The study also proposes the development of a predictive compensation model, where artificial intelligence can be used to predict workplace risks and calculate compensation based on risk exposure and workplace conditions. This model can help in faster compensation calculation and risk-based insurance systems. Another important change is the development of smart insurance systems, where insurance premiums and compensation systems are adjusted based on workplace risk data collected through artificial intelligence systems.

Artificial intelligence can also help in faster claims processing and reduce administrative delays in compensation systems. However, AI should be used only as a support system, and final compensation decisions should include human review to ensure fairness and transparency in compensation decisions.

7.3 Worker Protection Measures

The study emphasizes that worker protection must remain the primary objective of workplace safety and compensation systems in AI-driven workplaces. One of the most important worker protection measures is the right to privacy. Workers should have the right to know what data is being collected through AI monitoring systems and how that data is being used. Employers should not misuse worker data for surveillance or performance monitoring beyond safety purposes.

Another important worker right is protection against algorithmic bias. AI systems used in compensation decision-making must be transparent and free from discrimination. Workers should have the right to challenge automated decisions if they believe that the AI system has made an unfair decision. Therefore, workers should have the right to human review of AI-based compensation decisions.

The study also highlights that workers should have the right to compensation for injuries caused by artificial intelligence and automated systems. Compensation laws should clearly include AI-related workplace injuries within the definition of workplace injuries to ensure that workers are not denied compensation due to technological changes.

7.4 Proposed Techno-Legal Compensation Framework

This study proposes a techno-legal compensation framework that integrates artificial intelligence, legal regulation, and workers' compensation systems. The framework suggests that artificial intelligence should be used for workplace risk assessment, injury prevention, and compensation claim processing, but legal regulation is necessary to ensure transparency, accountability, and fairness in AI-based decision-making.

The techno-legal framework includes four main components: artificial intelligence technology for risk prediction and safety monitoring, legal rules for liability and worker rights protection, insurance systems for compensation payment, and human oversight to ensure fairness in AI-based decisions. This framework ensures that artificial intelligence improves workplace safety and compensation efficiency while also protecting worker rights and ensuring legal accountability.

The proposed framework emphasizes that artificial intelligence should assist legal and compensation systems but should not replace human decision-making completely. Human supervision is necessary to prevent algorithmic bias and ensure fair compensation decisions. Therefore, the techno-legal compensation framework provides a balanced approach that integrates technology, law, and worker protection.

8.CONCLUSION

This study examined the impact of artificial intelligence and automation on workplace injuries and workers' compensation laws. The study found that artificial intelligence plays an important role in reducing workplace injuries through predictive analytics, wearable safety devices, real-time monitoring systems, and robotics. These technologies help in identifying workplace hazards, predicting risks, and preventing accidents, thereby improving workplace safety and reducing injury rates.

However, the study also found that artificial intelligence creates new legal and compensation challenges. AI-related workplace injuries create problems in determining legal liability, especially in cases involving autonomous machines and human–AI interaction. The use of AI-generated data in compensation claims also creates issues related to privacy, data protection, algorithmic bias, and fairness in compensation decisions. Existing workers' compensation laws are not fully prepared to address these challenges.

The study concludes that workers' compensation laws must be reformed to address the challenges created by artificial intelligence and automation. There is a need for clear liability rules, regulation of AI-generated evidence, worker data protection laws, and AI safety regulations. Workers' compensation systems should also adopt artificial intelligence for risk assessment and claims processing, but human oversight must be maintained to ensure fairness and transparency.

The study finally concludes that the future of workplace injury compensation depends on the development of a techno-legal framework that integrates artificial intelligence, legal regulation, and workers' compensation systems. Such a framework will help in balancing technological innovation with worker rights, legal accountability, and fair compensation systems in AI-driven workplaces.

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