

Legal Research on Decision-Making in Artificial Intelligence and Corporate Management

Kim See You, Shin Dong Ho

Student and Professor, MY PAUL SCHOOL
12-11, Dowontongmi-gil, Cheongcheon-myeon, Goesan-gun,
Chungcheongbuk-do, Republic of Korea
eavatar@hanmail.net

Jeongwon Kim

Student, Department of Economics, College of Economics, Nihon University,
3-2 Kanda-Misakicho, 1-chome, Chiyoda-ku, Tokyo, Japan
eavatar@hanmail.net

Abstract

In this paper, if artificial intelligence affects the company's management decision-making process, it assists human decision-making in the decision-making process (shareholders' meeting, audit, information disclosure, etc.), and artificial intelligence makes its own decisions. (Artificial intelligence makes management decisions without human intervention in the board of directors, etc.)

First of all, at the general shareholders' meeting, which can be said to help in decision-making, it uses artificial intelligence to convene a general meeting of shareholders, publicize the general meeting of shareholders, and perform accounting audits and work audits rather than playing a key role in decision-making. Therefore, a more comprehensive and immediate audit is possible through real-time feedback of information through artificial intelligence. Artificial intelligence can also be used as a tool for corporate information disclosure.

On the other hand, artificial intelligence can learn on its own and play a key role in the management decision-making process of the board of directors because it can make altruistic and quick judgments if the input information is fair. Since the board of directors is an important decision-making body for the company, artificial intelligence can provide advice during the company's management decision-making process, unlike tasks such as shareholders' meetings or audits, and furthermore, provide advice when making important company decisions. Can on their own without human intervention. In addition, if management decision-making using artificial intelligence or artificial intelligence itself is wrong, legal problem solving can be a problem. And as our society develops, those problems will only get bigger and bigger.

In short, legal proceedings become very important when companies are harmed by AI-enabled decision-making. However, it is difficult to find the cause of errors caused by artificial intelligence due to the black box problem of artificial intelligence. Therefore, as a countermeasure against these errors, it has recently been suggested that the cause of errors caused by artificial intelligence can be identified by introducing and operating white box AI and XAI (Explainable Artificial Intelligence). And with these solutions, it is said that it is possible to determine whether there was a serious negligence in the decision-making using artificial intelligence, whether there was no conflict of interest, and whether the decision-making was carried out according to the principles.

However, as many physicists and mechanists claim, the development of artificial intelligence has outpaced all human intelligence combined.

In this paper, we assume various cases that may occur when companies apply and operate slightly strong artificial intelligence (level 4) that can be fully recognized in reality, and there are legal and institutional problems to solve them. And I'm looking for a solution for that.

Keywords

Artificial Intelligence, Decision-making, shareholders' meeting, artificial intelligence audit and artificial intelligence director

1. Introduction

1.1 Purpose of the Research

As artificial intelligence technology raises problems with data information for decision-making, global IT companies that use it are also presenting various principles and norms to prevent risks arising from using artificial intelligence. Ethical and normative issues surrounding artificial intelligence have some common questions related to artificial intelligence regulation.

First, in order to answer the question of what role artificial intelligence will play after being introduced into human society, it is necessary to find out the development process of artificial intelligence, the components of key areas, and the degree of influence of artificial intelligence throughout society.

Second, in the development of artificial intelligence technology, it is necessary to find out how to give a new electronic personality to answer the question of what legal status artificial intelligence should have.

Third, along with the development of artificial intelligence technology, artificial intelligence has become more familiar with human society and what are the legal and institutional means of responsibility in preparation for various risks that may arise as a counteraction to it, and how to apply it in civil and criminal cases. You need to find out if you can do it.

Fourth, it is about how artificial intelligence will change our society.

In this paper, rather than the problem of applying artificial intelligence to society as a whole, we want to examine the problem in the decision-making process that occurs within the scope of a narrower company. Table 1 shows the classification by AI level.

Table 1. AI step-by-step classification

step	AI capabilities and autonomy
Step 3 (weak)	It is a level of expertise that exceeds human capabilities in a specific area. Steps that can be used in specialized fields. no autonomy.
Step 4 (slightly strong)	information about data in the Reasoning Machines stage. Steps where insight is possible . An advisor superior to humans . doctor 's board , Only 'insight ' for given data is possible
Step 5 (strong)	Soap to the level of Artificial General Intelligence (AGI) Software independent of humans, hardware independent stage without rhythm

2. Body

2.1 Legal Status of Artificial Intelligence

Considering the legal status of artificial intelligence as a simple means of human communication, and attributing the act to the owner, operator, or occupier of artificial intelligence, the simplest method is the current standard. However, as artificial intelligence is highly developed, criticism has been raised that this recognition method does not reflect reality (Jang 2021). If it is out of range, users who use it have no way to deny the effect of artificial intelligence's autonomous actions, which can lead to unintended results. For this reason, I would like to look into the introduction of electronic personalities, focusing on strong artificial intelligence in step 5.

Legal personality should be granted by legislation, but it is impossible without a reason or basis for it, so first of all, it is necessary to review whether or not artificial intelligence is recognized as legal personality according to the corporation system. (Lee 2016) (Kim 2018) There is a limit to the application of technologies such as general artificial intelligence or WBE artificial intelligence within the framework of the current legal system. there is Therefore, rather than granting a status similar to the current legal theory, it is necessary to give artificial intelligence a new electronic personality, a legal personality, to ensure legal stability and to make the relationship of responsibility more clear. (Song 2017) For this reason, artificial intelligence Granting legal personality to an intelligent robot may also vary depending on the policy of the law, but unless strong artificial intelligence (step 5) exists, any existing computer program has the ability to justify serious judicial questions raised about the legal personality issue. (Seo 2020) In the future, if it is not general artificial intelligence or WBE artificial intelligence equivalent to humans, or if artificial intelligence that surpasses human capabilities is born, we will judge whether the granting of legal personality is beneficial to humans. It is said to be possible. (Kim 2019) However, considering the part about 'electronic person' in our current law (Civil Law), the subjectivity of rights of a corporation is recognized for two purposes. The second is to seek convenience, and the second is to separate the responsibility of individual members and groups. (Kim 2012)

If this is applied to the subjectivity of artificial intelligence, it is convenient to process legal relationships with artificial intelligence as in corporations, or It is necessary to consider the separation of responsibilities between owners (occupiers) and producers, but difficulties are expected as to whether it is possible to separate responsibilities from artificial intelligence, owners (occupiers), and producers. I think that these difficulties will eventually develop in a direction that is beneficial to humans. Currently, in our civil law, a corporation is an organization created for a specific purpose that has been granted legal capacity. Corporations are classified into organizations, which are collections of people, foundations whose rights and capabilities are granted to independent property, and foundations of public works under public law (Kwak 2002). (Shin 2013) If an artificial intelligence is given electronic personality, it must be recognized by borrowing the information about the foundation. This is because it seems more reasonable to view artificial intelligence as a corporation without members and a property group (a collection of data) endowed with legal personality for the realization of a designated purpose, rather than borrowing an incorporated association, which is a collection of people.

2.1.1 Disclosure of Electronic Seal

In order for artificial intelligence to acquire legal personality as an electronic person, it will have to register its establishment just as a company registers its establishment to acquire legal personality. Furthermore, procedures such as drafting the articles of incorporation, confirmation of members, confirmation of investment, and composition of institutions are also necessary before registering the establishment of a for-profit corporation called a company (Son 2015). In other words, in order for artificial intelligence to acquire an electronic personality, it is necessary to ① clarify the purpose of an electronic person, ② determine the scope of data that an electronic person can acquire, and ③ determine the operating property of artificial intelligence. see. However, artificial intelligence as an electronic person requires the introduction of an 'AI electronic registry' that can be managed because the location of the head office is unclear unlike corporations.

2.1.2 Supervision of Electronic Persons

This is because if electronic signatures are operated in the wrong direction, they may cause great damage to society, such as stock price manipulation, disrespect for human life, and unauthorized use of personal information. For this reason, in order to supervise electronic personnel, it is necessary to establish a (tentatively named) electronic supervisor under the Ministry of Information and Communication. This is because artificial intelligence coexists with necessity and risk. In addition, it is necessary to determine the property acquisition issue for the electronic person, and tax laws and merger or division problems regarding the electronic person's profits issued while the electronic person is running a company or profitable business may arise. may be needed

2.1.3 Electronic personal injury insurance

In October 2020, the EU adopted an AI legislation (recommendation) in preparation for various disputes and accidents caused by artificial intelligence. Strict liability for damages was mentioned. In addition, in order to curb damaging activities that may occur due to artificial intelligence, protect citizens, and promote trust in AI technology, the harm that artificial intelligence may cause (harm or damage to human life, health, property, and virtual intangible All artificial intelligence damage) needs to be compensated, and to solve this problem, member states are recommending that AI operators purchase insurance similar to that applied to automobiles. If electronic personnel are introduced in Korea, as in the EU, it is necessary to have artificial intelligence operators sign up for artificial intelligence insurance as one of the solutions to compensate for possible damages caused by artificial intelligence.

2.2 Artificial Intelligence (Step 4) and Company Management

2.2.1 Decision-making problems through artificial intelligence

Many errors can occur during the decision-making process of artificial intelligence. There are also views mixed with concerns about the digital cartel, such as price fluctuations occurring at the same time due to the use of price algorithms in the market by artificial intelligence, and almost the same price being offered for the same kind of goods and services. (Lee 2021) Recently raised ESG The management ideology of eco-friendly management, socially responsible management, and governance improvement, which is comprehensive and requires value judgment, is difficult to understand or predict with the current stage of artificial intelligence technology. Human preference can be said to be the data that is the foundation of artificial intelligence learning. In order for artificial intelligence to recognize society and judge the future, data accumulated in numerous environments is essential, and big data, a large set of such data, has flaws. When it happens, artificial intelligence is bound to make an error. In other words, there can always be a

possibility of errors occurring due to lack of fairness and errors in the input data to make decisions only with artificial intelligence from these numerous data.

2.2.2 Changes in the business environment due to the development of artificial intelligence technology

Companies that produce and provide products and services using artificial intelligence can be classified as an artificial intelligence front industry. From the perspective of the industry value chain, the artificial intelligence industry consists of providing artificial intelligence production tools, providing products and services using artificial intelligence, and providing services for building and supporting artificial intelligence systems. Therefore, the artificial intelligence industry can be said to be an industry that creates value in the process of developing artificial intelligence-related technologies or producing, distributing, and utilizing products and services using artificial intelligence. Looking in detail, the artificial intelligence industry in a narrow sense is an industry that produces and provides artificial intelligence software, hardware, and services. Organizations have humans as essential members, but since artificial intelligence replaces humans, organizations where humans and artificial intelligence coexist or new organizations composed only of artificial intelligence are expected to arise. As such, with the development of artificial intelligence technology and the introduction of artificial intelligence, new organizations within the company are expected to appear in various forms. The advent of artificial intelligence will enable more democratic decision-making than now through transparent information disclosure and promptness. In this regard, it is necessary to find out more about how decision-making within companies will change with artificial intelligence robots.

2.2.3 Shareholders' meeting, decision-making, audit, corporate information disclosure through artificial intelligence

2.2.3.1 Electronic shareholder meeting through artificial intelligence

Regarding the convocation of the general meeting of shareholders, the date and time and place of the meeting must be determined by the board of directors and stated in the notice and public notice of the convocation (Article 362 of the Commercial Act). Korea's commercial law strengthened the authority of the board of directors and reduced the authority of the general shareholders' meeting, so that the general shareholders' meeting became an institution capable of making resolutions only on matters stipulated in the commercial law or the articles of incorporation (Choi 2017). Since it was strengthened, there have been continuous legal and institutional improvements, and it is necessary to revitalize it within the large frame of corporate governance change. The introduction of artificial intelligence at the shareholders' meeting has factors that can sufficiently improve efficiency and economic feasibility, such as speed of decision-making, cost reduction, and fairness, and more advanced publicity effects can be expected. When convening a general meeting of shareholders, a written notice must be sent to each shareholder two weeks before the general meeting of shareholders, or a notice must be sent electronically with the consent of each shareholder, and the purpose of the meeting must be written in the notice (Article 363 of the Commercial Act). article). The notice and announcement of such a convocation and accompanying documents and business reports, or reference documents and issuance of shareholders' meetings can be sufficiently performed with the current level of artificial intelligence, and there seems to be no legal problem. In addition, if artificial intelligence is introduced, it is possible to devise a plan to make the shareholders' meeting more electronic, and the exercise of voting rights by electronic methods such as electronic voting can be made easier. According to our commercial law, a company with a total capital of less than 1 billion won can hold a general meeting of shareholders without convening a meeting if all shareholders agree, and a resolution in writing can replace the resolution of the general meeting of shareholders. When all shareholders agree in writing on the purpose of the resolution, it is deemed that there is a written resolution (Commercial Act, Article 363, Paragraph 4).

2.2.3.2 Proceedings through artificial intelligence

Will it be possible to conduct proceedings by artificial intelligence if it is stipulated in the articles of incorporation or appointed at the general meeting of shareholders? I think it is possible enough if the general meeting of shareholders proceeds formally. Therefore, among currently operating artificial intelligence (level 4), artificial intelligence with communication capabilities may be able to proceed. In Korea, the chairman of the general meeting of shareholders is appointed at the general meeting unless otherwise specified in the articles of incorporation, and the chairman of the general meeting has the authority to maintain the order of the general meeting and organize the proceedings (Article 366 of the Commercial Act). In Korea, online orders and dynamic conversations are possible through AI speakers, and in Japan, there are cases where Softbank's human-type emotion recognition robot 'Pepper' is used as a moderator of internal meetings, etc., and has the ability to read text. and voice recognition technology will be able to do this sufficiently.

2.2.3.3 Audit

Audit refers to a necessary permanent institution of a stock company whose main task is to audit the business and audit of the company. Among the business related to the company, one of the things where the use and utilization of artificial intelligence is being reviewed the most may be accounting work and auditing work. This is because, for example, electronic dynamic calculation processing tasks such as auditing and checking various accounting transactions that occur in a company in accordance with established corporate accounting standards seem to be easy for artificial intelligence. Even now, I think it is a field that can be fully utilized because it is operated at a level where automatic checks are possible in corporate ERP systems, such as journal entries, daily schedule creation, and major book processing (balance statement, income statement, total balance trial statement, etc.). According to the External Audit Act of Korea, a company must prepare its financial statements and undergo an accounting audit by an external auditor independent of the company (Article 4 of the Act on External Audit of Stock Companies, etc.). In addition, with respect to accounting standards, they are operated in accordance with the International Accounting Standards of the International Accounting Standards Commission after deliberation by the Securities and Futures Commission in accordance with the Act on the Establishment, etc. of the Financial Services Commission.

2.2.3.4 Corporate Information Disclosure

2.2.3.4.1 Obligation to disclose AI-related information

If artificial intelligence is actively used in corporate management decisions, it is considered a matter of course that appropriate disclosure of information about it is required. If artificial intelligence has a significant influence on the company's management decisions, it would be a very natural flow for stakeholders to want information about the artificial intelligence used by the company in order to deepen their understanding of the company's management decisions. Just as corporate information is disclosed, accounting books are disclosed and audited, artificial intelligence is introduced, and artificial intelligence robot development companies claim that artificial intelligence robot technology should be disclosed and audited for responsible artificial intelligence development. (Lee 2019) Considering that the company is also actively promoting the use of artificial intelligence in the company's management decisions, there is an aspect of attracting public attention with the rationality and transparency of management and the advancedness of the company. Regarding the disclosure of artificial intelligence-related information, it is thought that there are many companies that promote without any sense of resistance. For example, a company that sells handicrafts made by skilled artisans values the corporate image of 'a good old store made only by human hands', so it informs consumers that artificial intelligence is being used for management decisions. You may think you don't want to know. As such, there are parts that are fully understandable even for companies that do not want to disclose, and accordingly, it may be excessive to impose uniformly the disclosure of information on artificial intelligence to all companies. Therefore, it is necessary to create a principle that can be accepted by both stakeholders who require disclosure of AI-related information and some companies that are passive in disclosure. I think it is necessary to prepare and leave it to the company's decision as to which form to choose. However, there is a difficulty in estimating the level of artificial intelligence that needs to be disclosed now, and in some companies, there may be companies that oppose public disclosure by using artificial intelligence in the company's management decisions due to brand strategy or personal beliefs of the manager. .

2.2.3.4.2 Subjects of disclosure of AI-related information

A company that is obligated to disclose has a problem of what kind of artificial intelligence-related information and how much it should disclose. Specifically, ① how to set the 'final goal of the company' in terms of AI program design, ② how the data on which artificial intelligence makes decisions are collected, ③ information on what algorithms artificial intelligence is designed with Regarding the public disclosure, it seems necessary to discuss.

From the point of view of securing the predictability of artificial intelligence's actions and judgments, it is necessary to devise not to deviate between the announced contents and the contents of the artificial intelligence program actually operated regarding the public announcement surrounding the 'final goal as a company' in the future. expected For example, first, artificial intelligence may require quantitative and specific descriptions because it can cause a gap in actual performance for qualitative and abstract goals. Second, in the case of listing multiple 'final goals as a company', it is desirable to quantify and describe the priority or weight of each goal. In the case of describing two different goals, A and B, if the company values goal A rather than B, it is not just that both are described in parallel, but 'a decision related to A is related to B' It is also considered to make a public announcement that penetrates into both weights, such as 'put twice the weight compared to the judgment'.

2.2.3.4.3 AI related input data

Disclosure on the method of collecting data on which artificial intelligence is the basis for judgment will also be required. In order to increase the accuracy of artificial intelligence, a large amount of data is generally required. However, flaws in these data are the starting point for artificial intelligence to commit serious errors in business decision-making. In Korea, such an error can be cited as an example of the artificial intelligence chatbot 'Iruda' described above. In this way, if decision-making is judged by the learning data of artificial intelligence, stakeholders will want to understand the contents of the data used as the basis of the judgment in order to confirm whether AI can expect correct judgment from the company.

2.2.4 Management decision-making by the board of directors through artificial intelligence

2.2.4.1 Artificial Intelligence Director

Even now, decisions are being made based on a lot of data before making company decisions, and based on this data, artificial intelligence assists humans by analyzing data and recommending numbers in various cases as 'insights'. Based on this information, human managers will be able to make 'foresight' decisions based on their own judgment. In addition, it seems that the permission of artificial intelligence directors should be sought from social and economic necessity. First of all, there is a view that it is convenient in that if artificial intelligence has the status of an agent from the legal point of view of transaction such as contract conclusion, the legal effect can be attributed (Choi 2020). There is a lot that can be done with artificial intelligence. In the end, if you want to arrest the company, it is easier to make the actions of artificial intelligence as the actions of the CEO. There is also an opinion that the position of a director should be recognized in order to hold the person who actually decides the next company's decision-making responsible for it. It is the logic that this decision is similar in relation to business directors or shadow directors in company law. However, since it is unrealistic to hold artificial intelligence accountable under the traditional corporate law, it is not persuasive to consider artificial intelligence as a director based on this.

The future of companies brought by artificial intelligence director robots is a change in corporate responsibility and purpose. In addition, artificial intelligence robots can efficiently handle high complexity, pursue various goals of business management, especially the interests of multiple stakeholders at the same time, and optimize the results of multiple goals at once within given constraints. It is expected.

2.2.4.2 Role of AI Director

2.2.4.2.1 The degree of use and role of artificial intelligence

With the development of technology, artificial intelligence provides information to human directors in the company's decision-making process. The role and technology of the 'insight' information provider has become more advanced, and artificial intelligence is directly appointed as a director. It can be thought of by dividing it into cases where decision-making is subjectively made with 'site'. First, when artificial intelligence (step 4) plays a role as an information provider, artificial intelligence is better than humans in analyzing data and has 'insight' and provides predictive values for it, which is an instrumental and assistant level role. The board of directors can make decisions based on the predictions provided by these artificial intelligence. Next, the technology is more advanced and an artificial intelligence director is appointed to the board of directors, and the artificial intelligence (step 5) makes decisions with 'Foresight' on its own. Of course, there is no artificial intelligence in the world that has advanced capabilities that can completely replace humans in corporate management decisions. However, Devin Fiedler, a researcher at the Institute for the Future (IFF), which continues to develop software that can automate business management tasks and research on AI and management in the United States, said about artificial intelligence that can manage these companies. It is called intelligence "iCEO" and claims that "if evolution continues at this rate, AI will be able to replace many functions of a company's management" (Website 2021). It is possible to participate and exercise the decision-making right, and in this case, the decision-making right of the board of directors is given to an artificial intelligence robot, so whether or not the decision-making right is delegated and responsibility can be an issue.

2.2.4.2.2 Special interests of artificial intelligence directors

In our commercial law, directors who have a special interest in the resolution of the board of directors cannot exercise their voting rights (Commercial Law, Article 391). In other words, in the resolution of the board of directors for the approval of their transaction, the corresponding director is a person of special interest and cannot exercise his or her voting right. In light of this, general-purpose artificial intelligence introduced by the company can be commonly used in the board of directors or in the field of practice, so if it is highly autonomous artificial intelligence, it can be placed in special interests outside the board of directors. For this reason, if artificial intelligence introduced by the company plays the role of an artificial intelligence director, it will be necessary to exclude it from decision-making so that a situation that can be placed in special interests does not occur.

2.2.4.2.3 Changes in the introduction of the artificial intelligence director system

In order to recognize artificial intelligence (step 4) as a director who makes decisions by himself, it is necessary to consider the pros and cons of introducing such an artificial intelligence director. Artificial intelligence has the advantage that it is faster than human decision-making, has logic that is not affected by human emotions, and has excellent fairness because it is more selfless than humans if there are no errors in data. Artificial intelligence learns from information that has already been input and predicts the complex future decision-making process by automating and predicting it at the time of decision-making, so it can analyze information faster than humans and quickly make specific judgments. According to AI, if the director's position is acknowledged, the company's decision-making can be made based on quick, logical, disinterested and fair judgment. A recent survey conducted by McKinsey & Company, an American consulting firm, investigated how much time American directors spend in total on board-related tasks. Directors spend 24 days a year on board issues. plan and strategy establishment 27%, ② performance management 20%, ③ organizational structure, culture and talent management 13%, ④ investment and mergers and acquisitions 12%, ⑤ core company acquisition 10%, ⑥ regulatory compliance or risk management 9% , ⑦ 9% is devoted to managing shareholders and stakeholders. As such, among the corporate tasks listed above, tasks more suitable for humans are ① plan management tasks (27%) and ⑦ shareholder and stakeholder management (9%), but 64% of tasks (performance management, compliance or risk management) excluding these seem to be. Business, culture and talent management, investment and mergers and acquisitions, key corporate acquisitions, regulatory compliance or risk management tasks) based on repetitive and continuous data, artificial intelligence can show a bit more strength than human directors, and directors can It is expected that 15 out of 24 days of participating in the event can be replaced with artificial intelligence robots.

Unlike humans, strong artificial intelligence (level 5) is capable of making judgments as collective intelligence, and makes judgments that are appropriate for the company's interests with judgments that are not swayed by individual personality, prejudice, or emotion. Because it operates, it is expected that it will not make judgments that would be expected to be against the interests of the company. Because artificial intelligence directors have no choice but to excel objectively in terms of professionalism and neutrality based on fair data input than other human directors, they can give more trust to directors in conflict and provide a breakthrough in decision-making. because it can be The judgment of these artificial intelligence directors may be the key to solving more decision-making problems for each board member than human directors with a more neutral judgment on the board. A lot of information processed by artificial intelligence is not comparable to the information possessed by human directors, and the processing speed of processing these information will not be comparable to human directors. It may lead to a more complete understanding and accurate judgment. Because of this, artificial intelligence can make the right decision through a professional decision-making process based on big data against directors who are trying to make decisions that cause damage to the company. The point is that artificial intelligence has no possibility of errors by misjudging its duties, and unlike human directors, it has insights based on big data input, so it prioritizes its own or third party's interests over the company's interests. It means that there is no possibility of violating the duty of fidelity, and it is possible to present opinions with objectivity and neutrality, which is impossible for humans, and these advantages are essential for running a company if possible. (Website 2021)

2.2.4.2.4 Allowing director positions for artificial intelligence

There are several problems in allowing AI robots to serve as directors by current standards. It is not easy to specify the duties of AI directors when AI is allowed to take the position of director. However, there is a problem in that even if these problems are overcome and duties are embodied in artificial intelligence and responsibility for duty violations is imposed, artificial intelligence itself has no liability property, so it cannot be held responsible for its duties. Moreover, even if responsibility is acknowledged by acknowledging the subjectivity of rights and duties for artificial intelligence, it ultimately leads to a problem of violation of the duties of a company or director who makes decisions through artificial intelligence, so there is no practical benefit to recognizing artificial intelligence as a director. I can say it's not big. However, as explained above, the participation of artificial intelligence robots in the company's management judgment has fairness and objectivity to judge only with accuracy and data, and there are enough factors to induce the company to use it because there are professionalism.

2.2.5 Principles of decision-making and business judgment through artificial intelligence

2.2.5.1 Principle of Business Judgment

The Business Judgment Principle is the principle that if a director makes a prudent and reasonable judgment within the scope of his or her authority and acts accordingly, the director is not held legally liable even if there is a result that causes damage to the company. (Seo 2012) In general, it means a reversible presumption that 'a director made a

managerial judgment or decision based on sufficient information, in good faith, and with the belief that it is in the best interests of the company in the course of performing his or her duties'. In other words, it refers to the principle of company operation under the Commonwealth Law, which exempts directors from responsibility by excluding judicial judgment for company management and transactions conducted in good faith and in good faith within the scope of the company's capabilities. Ultimately, since the court intends to refrain from conducting a feasibility test *ex post facto* on the management judgments of directors and executives, this principle serves to mitigate the legal responsibilities of directors and executives. This principle is based on the assumption that the board of directors appointed by shareholders makes business decisions in good faith and with due care and diligence for the company. This principle also protects the board's authority to manage the company and exempts directors from liability even if decisions made at that time were later found to be invalid. Decision-making in artificial intelligence is the result of being influenced by many actors, such as developers, users, algorithm producers, hardware, and designers, and many problems arise with regard to responsibility (Helen 1997). There is no problem with negligent performance, but it is also necessary to consider the question of whether it can be held liable for illegal acts, such as violating the obligations under the delegation contract entrusted to humans or causing serious damage to the company with malice. Inferring this, we can think about the application of management judgment principles to artificial intelligence that will be introduced and operated in the company in the future.

2.2.5.2 Applying the principles of decision-making and business judgment using artificial intelligence

This is because the board of directors must raise the value of the company for shareholders, and directors in the board of directors have a duty of care as trustees who must make reasonable and prudent judgments and take personal responsibility for their decisions. The degree of the general director's duty of care is 'the level normally expected of a person in that position and situation', but it is not clear what kind of action a director must specifically perform to fulfill the duty of care, and the level and content of the duty of care. This is because there is no choice but to find out individually through specific cases, and it is not only difficult but also undesirable to define it in writing. Not only that, but in practice, maximizing shareholders' assets is a legal duty of the board, and this legal duty often presents a challenge to the board. For example, the board of directors may sell a company in order to maximize shareholder value, make a life-and-death decision such as launching a new product, or merger of a company, which may bring large profits, while on the other hand, when the result is negative, shareholders. This is because the board of directors can hold them personally liable for damages. In addition, in a situation where the social environment and corporate environment are rapidly changing in terms of corporate decision-making, there are many cases in which rapid decisions must be made in corporate decision-making. If so, the management of the company could be seriously undermined, and the most suitable person to serve as a director without any protection against personal responsibility could possibly refuse to become a director or serve on the board. Therefore, decision-making using artificial intelligence will only increase. However, it is necessary to satisfy several facts in order to determine whether any one of the obligations of faithfulness, fidelity, and care has been violated in the decision-making of artificial intelligence robots and to apply the business judgment principle. The business judgment rule cannot be applied where a breach of good faith exists. In other words, if there is any rational management purpose, that is, if it is not an irrational judgment, the court does not intervene in the director's decision according to the business judgment principle. Therefore, in this case, the director's decision is recognized as lawful. Then, a problem arises as to how these artificial intelligence directors will participate in decision-making on their own in the decision-making process of the company and how to legally evaluate the decisions made. First of all, AI can currently be divided into the role of an assistant (level 3), the role of advisor (level 4), and the role of autonomous AI (level 5 and above). Therefore, it is expected that directors in companies will introduce these artificial intelligence robots in the form of merely assisting their work. This type of artificial intelligence robot can be called weak artificial intelligence, software artificial intelligence without low level or autonomy. Examples of such assistive AI systems include making voice calls and making reservations, creating repetitive and automatic text emails, scheduling appointments and scheduling, and performing helpdesk and customer service functions. First, the first potential role of an AI robot is that of an assistant (step 3). Their limitation is that they will never be mistaken for a human, and these AI robots will be able to perform tasks on behalf of humans, but will not make decisions on their own. The big difference between autonomous AI and the previously described assistant and advisory AI is that the AI robot has the right to make decisions. Then, when these autonomous artificial intelligence robots replace directors, management judgment is made on what duties and responsibilities the artificial intelligence directors have in relation to the use of artificial intelligence directors, and what damages will occur in the future from the use of artificial intelligence directors. It may be a question of whether the principle applies. Ultimately, it is the most advanced autonomous artificial intelligence (level 5 or higher) robot. In areas such as autonomous robot transactions and loan application processing, which already have self-driving cars and securities' foresight, artificial intelligence robots are performing with decision-making authority and are expected to become more common. To

discuss these issues, first, prior to the introduction of artificial intelligence (step 4) directors, whether the company bears the obligation to use artificial intelligence directors or whether the business judgment principle applies if not used, and next, the introduction of artificial intelligence. After that, if the judgment is based on the judgment or advice of artificial intelligence, how to apply the principle of business judgment when a decision is made against the judgment or advice of artificial intelligence, and finally, strong artificial intelligence (step 5), artificial intelligence. It is necessary to classify and examine the case of the problem that arises when it is applied instead of the role of all human board members.

2.2.5.3 Firm decision-making involving strong artificial intelligence (step 5)

In Korea, the number of directors must, in principle, be three or more (Commercial Act, Article 383, Paragraph 1), but companies with a total capital of less than KRW 1 billion may have one or two directors. (Commercial Act, Article 383, Paragraph 1) In the case of a small stock company with one or two directors, the function of the board of directors is basically replaced by the general meeting of shareholders, and each director or representative director represents the company and, in certain cases, assumes the functions of the board of directors.

2.2.5.3.1 AI Directors and Changes in Governance Structure

2.2.5.3.1.1 Changes in governance structure

In an era of AI-dominated corporate governance, these traditional boards of directors will become unnecessary. First, when AI allows robots to replicate the benefits of human group decision-making and outperform both the speed and quality of decisions made by human organizations, multi-member boards are likely to disappear. Perhaps these developments will prompt policymakers to introduce legal reforms around board composition and appointments, enabling companies to move towards AI boards and management.

2.2.5.3.1.2 Integrated board

With the advent of strong artificial intelligence robots, we should expect the size of the board to shrink. In my opinion, it is expected to be a board of directors that is more advanced than the current stage, and can be called a 'fusion board' composed of humans and artificial intelligence. For this reason, characteristics such as combined knowledge and skills, advantages of group decision-making, diversity and independence, which could only be provided by collectives before, are expressed in artificial intelligence robots through the coding function of algorithms. Here, it means that the diversity of the directors who make up the current collective board of directors is merged and provided as a single entity called "AIDirector". These artificially intelligent robots could still be chosen and "assigned" by shareholders and could be switched to other, better software systems on a regular basis. The benefits of collective boards are considered useful because they improve access to information, mitigate the effects of limited rationality, discourage decision-making based on personal bias, allow directors to monitor each other and reduce agency costs within the board; It can help delegate responsibilities and alleviate excessive workload on individual directors. Next, we assume that the director of the artificial intelligence robot works 24 hours a day, efficiently processes available information, calls and utilizes this information almost immediately, may execute functions without personally demanding compensation, and operates selflessly. This eliminates the need for multiple directors to monitor each other to alleviate conflicts in human behavior.

3. Conclusion

Artificial intelligence will become an indispensable part of company management. Prior to the development and introduction of artificial intelligence, we will first understand this artificial intelligence and identify the good and bad points that may appear in the future, and the introduction of a legal system accordingly will be urgent. In other words, we are at a stage where we have to judge what role this artificial intelligence will play, what results the work performed by artificial intelligence will have and how it will affect the world, and how these things will be done within the framework of the law.

Whether to recognize artificial intelligence as a legal personality will be judged according to what role artificial intelligence will play and influence in the human world in the future. This is because the issue of granting legal personality is a matter of artificial expansion of the historically changing, variable and relative concept of personality, and is only a matter of securing legitimacy from the point of view of legal policy.

If artificial intelligence technology is further developed and it is possible to create algorithms and select input values by itself, such artificial intelligence (step 45) may recognize these laws and regulations on its own and take measures against violations in advance so that the law cannot be applied. . In addition, if the opponent of artificial intelligence is also a robot of artificial intelligence, there is a possibility that unity can occur with each other, so there is room for

problems, and it is a very professional area to objectively judge the injustice of these problems, and artificial intelligence also has such problems. There is also the possibility of recognizing the difficult problem of objective judgment in advance and applying it after judging it in decision-making. Moreover, it is difficult to determine whether or not human beings have violated the duty of care for negligence with respect to artificial intelligence due to the problem of black boxing.

When a company conducts independent management using artificial intelligence (step 5), decision-making is made by algorithm commands according to the rules and information of the given company, and artificial intelligence (step 5), which makes decision-making based on a predetermined algorithm, is a human director. Unlike directors, there can be no serious negligence unless there is a particular error in the production process or data, and since artificial intelligence does not have liability property, there is no conflict of interest, and there can be no intentional neglect. Violation is also difficult to apply. If the problem of black boxing, where the decision-making process is unknown, is transparently managed through white box AI or explainable artificial intelligence (XAI), the party concerned will inform the artificial intelligence director about damages to the company or a third party caused by the current director's wrong judgment. You may not be able to claim damages. Therefore, if such AI management is applied, the current system of business judgment principles can become an outdated policy.

This thesis is expected to provide implications for introducing various cases that may occur when such artificial intelligence is applied and operated in a company and introduce related laws and systems.

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Biographies

Kim See You is student in MY PAUL SCHOOL. He is interested in artificial intelligence, deep learning, cryptography, robots, healthcare, block chains, drones, autonomous vehicles, etc., and is conducting related research.

Jeongwon Kim is student in College of Economics, Nihon University. She is interested in artificial intelligence, deep learning, cryptography, robots, block chains, drones, autonomous vehicles, etc., and is conducting related research.

Shin Dong Ho is Professor and Teacher in MY PAUL SCHOOL. He obtained his Ph.D. in semiconductor physics in 2000. He is interested in artificial intelligence, deep learning, cryptography, robots, block chains, drones, autonomous vehicles, mechanical engineering, the Internet of Things, metaverse, virtual reality, and space science, and is conducting related research.