

Application of AI Technology in Mergers & Acquisitions and Its Regulation

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Abstract: Applying Artificial Intelligence (AI) brings more possibilities to the Mergers and Acquisitions (M&A) process. However, with the high development of AI, its safety and ethical consequences are gradually emerging. This paper adopts the case analysis method and uses AI's specific application in the due diligence process as an example to analyze the legal risks of its program testing environment, data extraction security, and error tolerance rate.

Also, this paper will use contrastive analysis and documentary analysis to explore the legal gaps and prospects of AI in M&A by taking the EU's AI Ethical guidelines, the AI Act, and Guidance for Regulation of Artificial Intelligence Applications from the US as examples, analyzing the regulatory directions and regulations for M&A.

Keywords: Mergers and Acquisitions, Artificial Intelligence, legal supervision and management

1. Introduction

With the advance of science and technology, more high-tech products are introduced to accomplish people's goals much more sufficiently. Among these technologies, artificial intelligence (AI) is being gradually applied to various fields and plays an important role in different industries due to its outstanding ability to replace human work. Under the circumstance, people have strong interest to explore how to further apply it to more detail position, for example, the Mergers and Acquisitions.

As an important tool, AI could run the predefined programs based on the more exact logic than human mind after being trained elaborately. With higher efficiency, lower error rate and more self-study abilities, AI could help save labor greatly. Also, the key to the bidders, trying to avoid any possible risks in the transaction, is to make sure that all the information resources of their decisions are reliable. It is AI that exactly has the ability to collect, counter, filter and analyze huge amounts of data available in specially sizable transaction with its data-mining function.

However, together with the advantages, there are also negative effects. Firstly, although most of AI frames are open sources, the technologies may still lack of stable testing environment and are still too premature to satisfy bidder's needs, for instance, the model and data used are, now and then, not so trustworthy and explainable. Secondly, using AI in the process may meet some legal risks. As a human-like technology, AI owns social attributes that make it different from other technologies, however, legislation in this area are not simultaneously introduced all over the world.

The lack of legal supervision and management may lead to security concerns and unpredictable results.

In the long term, using AI to assist mergers and acquisitions might be a new trend. Governments have introduced laws or guides on artificial intelligence in recent years, like the Ethic Guidelines for Trustworthy AI from EU, the AI Act from EU and Guidance for Regulation of Artificial Intelligence Applications from US government.

2. Case Description of Using AI in Due Diligence of M&A

The specific case of using AI program to assist M&A requires several parts of different coding system. How AI works in what data will be collected and used is the purpose of this case analysis. Base on this, the advantages and disadvantages of AI application will be further collated and studied to make suggestions on how to legislate and regulate AI. This method could transform the specific terms in the M&A field into variables in computer language, taking into account the study of outliers, and replace clear language with fuzzy language, which increases the operability of AI applications.

2.1. The Summary of the Propose of Coding

One of the functions of due diligence in mergers is to identify competitors suitable for consolidation with the bidder, that is, to filter out the target of merger. In the early stage of due diligence, the AI program runs in the order of first identifying competitors and then identifying competitors that are suitable for mergers and those that are not to maximize the realization of the company's goals by transactions.

2.2. Fuzzy Data Mining Framework

Starting from the basic information obtained by the data access terminal, the first layer of information is accessed through the data provided by the other party or the data obtained by the crawler. Then the fuzzy data mining model would be used. In this fuzzy data model, elements with different attributes are classified, and Clustergrams are generated for analysis. In the case of a bank, the initial information contains the balance sheet, the income statement, and the other elements in these two accounting tables, such as capital and liabilities, assets, income, expenditure, etc. The program will capture and group these data to form a specific small data set that already contains rows and set relationships. The program will use the cluster data function to process the data and develop the cluster tree. (Figure 1)

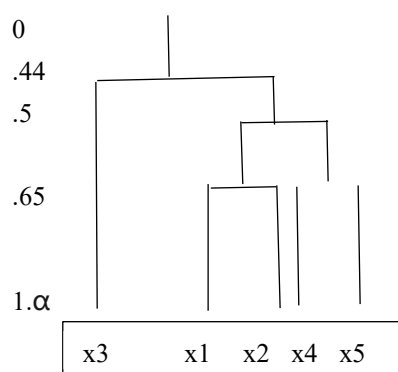


Figure 1: The fuzzy data mining model.

There is close association between points (x1, x2) and between points (x4, x5).

Multidimensional (with multiple attributes) clustering is also possible. Organizations in unlike-clusters complement each other, and are suitable contenders for merger. Conversely, in the event contender organizations belong to same cluster, they are not the appropriate contenders [1].

2.3. Fuzzy Data Mining with Relational Database

After identifying suitable competitors to be acquired, the previous set is used for further analysis to obtain institutions located in different regions (regional access) related to the bank under investigation and the bank's financial situation (financial statement) in additional fiscal years. Finally, an icon based on the nearness of regions to the reference region [2] is produced, which can be used to filter several candidate banks from 2.2 again.

3. Negative Impact

The effects of AI in M&A do not always come out positively. People consistently eagle to use AI while keeping wary of defending against the potential hazard and threats that AI probably causes. Although the application of AI in the M&A field is fewer than in others, the situation is still complex because of the lack of law practice in AI.

3.1. The Lack of Testing Environment

Although the specific coding of AI programs is already done, the technologies may still lack a stable testing environment and are too premature to satisfy the bidder's needs. For instance, the model and data used are, now and then, not so trustworthy and explainable.

Although specific AI programming methods already exist, they are still in a relatively ideal stage and lack practical application examples. One of the reasons for this is the lack of a stable testing environment and testing methods: First, testing AI requires a large number of sample data, but most companies' financial data (such as balance sheets and profit and loss reports) are not publicly available, so it is challenging to obtain test data; On the other hand, if the number of sample data is not enough, the correctness and rationality of the program cannot be verified, which will lead to the inability to be applied in practice or lead to the deviation of the actual results.

The second reason is the complexity of the application environment: Not all the original AI programs can be directly applied to different cases, there must be differences between the various bidders and targets, and the AI program needs to be further adjusted according to the alien, and as a explains after the adjustment program will also because of the lack of test environment and test methods not achieve the desired effect. At the same time, re-changing the program incurs additional time costs and financial costs, which sometimes can be even higher than the salary of hiring people to do the job. In other cases, it is unnecessary to continue using AI to assist in completing M&A. In addition, bidders with different types and targets should proceed with different aims such as investment or profit; There are also differences in the way they acquire and acquire things, and AI programs do not directly meet every need most of the time.

The third reason is the shortage of interdisciplinary application talents. AI programming requires a certain level of expertise and is not easy for everyone; The merger and acquisition field involves business, accounting, finance, and many other contents; there is a high industry threshold. The collaboration of both parties relies on expertise, and as a result, industry barriers have raised barriers to entry for the integration of AI programs into the M&A space. Most importantly, M&A involves much legal knowledge. Once AI is applied, it will be important topics to ensure that it complies with relevant legal regulations during operation, improve applicable laws further, and remove regulatory procedures based on AI's characteristics and application.

3.2. The Lack of Error Tolerance

As a tool to simulate and develop human intelligence, AI has a strong ability to learn. Machine learning, natural language processing, knowledge graph, and artificial intelligence computer vision reduce the threshold and cost of a third-party application and significantly improve service efficiency. As illustrated in 2.1-2.3, AI can complete data processing and modeling through some programming and then assist in the due diligence process of M&A through detailed data analysis and risk estimation. However, there are certain risks in the whole process. In addition to the technical risks mentioned in 3.1, the ensuing security risks also need the intervention of legal supervision.

In 2.2, the AI of the object of data mining is considered to be a potential acquirer, data mining is the premise of obtaining potential by the targets' balance sheet, such as data information, and not all companies have announced the results of the query to the outside world, especially to want to get my competitors as the acquisition of companies, much of the data on the target is hard to come by. To make the AI program work properly and achieve the target of the acquirer, the acquirer may obtain information through non-compliant or illegal means. Getting data will likely involve the risk of data security and invasion of privacy. At the same time, it will cause vicious competition and bring negative impacts to related enterprises [3].

Secondly, several critical conditions, as mentioned previously, ensure that Artificial intelligence will operate correctly and accurately. Even if AI fits all the requirements, AI may make mistakes, maybe even more absurd and stupid than human beings' work.

Colloquially, the error tolerance rate refers to the range and probability of allowing errors. In some games, error tolerance demonstrates a team's chance to make mistakes without destroying the whole game. That is an exact indication of the legal business, which has a very low tolerance for error. Once making a mistake will ruin even a very tiny one, the entire project and acquisition transaction. All the participants then will pay the price:

- Decision-makers suffer from the loss of enormous capital.

- Law firms take civil liabilities and suffer reputation damage.

- Investment banks are unable to recoup the investment.

- Also, there will be a waste of social resources.

The M&A transaction contains massive data, information, paper, and other essential factors, which need to be correctly collected and transferred into the AI system for the final analysis. For that, a clerk inputs a wrong number into the system without any notice, possibly changing the final result of an essential financial index according to which the buyer decides whether to launch the transaction. Supposed that lawyers are not prudent enough to spot a lawsuit the target company involved, it will cause a sequence of errors:

- Buyers cannot realize the lack of internal control.

- The lawyer provides a flawed basis for decision-making.

- The buyer offers a much higher price.

- Even the value of the target corporation is wholly wiped out after the lawsuit.

In M&A, the tolerance of such essential errors is zero, and no party can stand the racket. In some circumstances, it will ruin a participant's career forever, especially for a lawyer who relies on reputation and credibility.

4. The AI Regulation and Future Development

The application of artificial intelligence in the financial field also brings certain risks and hidden dangers to the steady development of the M&A due to the variability of its technical operation mode and the complexity of system operation. Therefore, it is necessary to research the application

of regulatory responses by artificial intelligence in the financial sector to enhance the ability of the bidder Co. and target Co. to resist the risks brought by new technologies.

4.1. The Ethics Guidelines for Trustworthy AI

On 8 April 2019, the High-Level Expert Group on AI presented Ethics Guidelines for Trustworthy Artificial Intelligence [4]. These guidelines were first proposed in December 2018 and had experienced a three-month public consultation. It sets out a specific framework for achieving Trustworthy AI and points out that trustworthy AI should be composed of three features: lawful, ethical, and robust. The frame comprises two parts: firstly, the ethics norms: human rights that should be respected, applicable laws and regulations for AI, and core principles and values; secondly, technology should be strong enough and reliable [5]. On this basis, the draft is divided into three main chapters. Chapter I expounds on the fundamental rights and ethical principles that should be followed; also the value views determined by the ethical goal of AI. Chapter II indicates the way to realize the Trustworthy AI through seven requirements, which include technical and non-technical methods, and taking into account the ethical guidelines and technical robustness. Chapter III provides an assessment list of Trustworthy AI that targets evaluating the AI with the requirement in chapter II. This Guideline emphasizes spontaneous ethical constraints and pays more attention to respect for "human" and universal participation. It is easy to understand and execute [6].

AI in the M&A involves a variety of applications such as information collection, data mining, analysis, and quantification. How to ensure that its use does not violate ethics? How do the acquirer and the target ensure symmetric information and the same cognition about the AI program? How to make the AI conform to the standard of Trustworthy AI? These are issues that need to be addressed in future AI applications to M&A. The Guideline presents a reference standard for relevant developments.

4.2. The AI Act

To further enhance innovation in the application of AI technology with European values and fundamental rights, in April 2021 European Commission introduced the proposed AI act, which was the first law on AI by a significant regulator anywhere. It assigns AI applications to three risk categories: unacceptable risk, high-risk applications, and applications not explicitly banned or listed as high-risk [7]. It has a specific and clear rule about data and data governance for high-risk AI, including training models with data that shall be developed based on sets that meet the quality criteria. Also, the whole data processing should be managed by the practical standard.

Although the application of AI in M&A is not explicitly mentioned or defined in the Act, its regulation on high-risk AI still has great reference significance. For instance, Article 10 on data and data governance stipulates that all collected data should meet specific quality criteria. Seven aspects such as appropriate design choices, data collection, and relevant data preparation processing operations should be considered during data training.

4.3. Guidance for Regulation of Artificial Intelligence Applications

In January 2020, the Office of Management and Budget of the U.S. released a memorandum to all federal agencies and executive offices, the "Guidance for Regulation of Artificial Intelligence Applications." [8] In this Guideline, the U.S. government illustrates the principles for the Stewardship of AI Applications, including public trust, public participation, scientific integrity and information quality, risk assessment and management, benefit and cost, flexibility, fairness and non-discrimination, disclosure and transparency, safety and security and interagency coordination.

IBO considered regulating AI applications while also paying attention to protecting the development of AI technologies.

For the United States, maintaining its global leadership in AI development is critical to economic and national security development. Therefore, enhancing U.S. scientific, technological, and economic leadership in AI may be the core competence of U.S. government policy, and the AI regulation naturally serves this purpose.

The U.S. government's AI regulation is based on encouraging innovation and development, emphasizing flexible management. Relevant agencies should use a performance-based flexibility framework to adapt to the rapid changes and updates of AI applications. It has implications for the future regulation of AI, namely to reduce the lag of regulatory laws. The application of AI in M&A involves interdisciplinary knowledge, which has higher requirements for the acquirer, the target, and the regulator. It is also easy to cause the situation of inadequate supervision. Increased regulatory flexibility would help reduce this regulatory gap.

4.4. The Recommendations on the Regulation of AI in the M&A

The regulation of AI in M&A should focus on three areas: firstly, clearing the regulatory objects, which include but are not limited to bidder and target, legal person, and natural person. Secondly, improving the regulatory system from the related department. British financial conduct authority put forward the FinTech Sandbox in 2015, aiming to encourage innovation and development of FinTech to control risks effectively [9]. This mechanism helps to find a balance between innovative business models and regulators' better monitoring [10]. It also improves the synergy among the market, firms, and consumers. Similar regulations are also appropriate to the AI that applies for M&A. Thirdly, ensuring the data information security and optimizing the authorization of data acquisition. Government should ensure that the data collected by companies using AI for M&As are legally sourced and do not infringe on the rights of other entities.

5. Conclusion

Overall, AI in M&A still has excellent research potential. Although European and American countries have taken specific measures in AI management and FinTech management, there is still a lack of specific legislation on AI in the financial industry. The problems the bidder Co. and target Co. should face are how to use AI in the M&A process to reduce costs and improve accuracy and efficiency. The government must also introduce more detailed regulations and set up corresponding regulatory departments. With collaboration, artificial intelligence in M&A will have further development.

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