

The Role of Financial Technology in Enhancing the Efficiency of Legal Services

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Abstract

With the rapid development of financial technology (FinTech), its application in the legal service sector is gradually becoming a key force in driving industry innovation. This paper uses both qualitative and quantitative research methods to explore the interaction and synergistic effects of financial technology, regulatory technology (RegTech), and intellectual property protection (IP Protection) in the legal service industry. The study analyzes the current status of financial technology in contract law, compliance checks, and dispute resolution, and evaluates its actual effect on improving the efficiency of legal services.

The study found that financial technology has optimized the contract execution process through technologies such as smart contracts and blockchain, improved the level of automation in compliance work, and provided new ways for dispute resolution. Although facing challenges such as technology integration, data security, and legal regulation, these challenges can be effectively controlled through effective risk management and strategic response. The study proposes a series of strategic recommendations, including technological innovation, policy support, education, and training, to promote the collaborative development of financial technology, regulatory technology, and intellectual property protection in the legal service industry. (Beck, R., Bugnion, F., & Pohl, M., 2018)

The conclusion of this paper emphasizes the positive role of financial technology in enhancing the efficiency of legal services and points out strategies to cope with challenges, providing valuable insights and suggestions for legal service providers, technology developers, and policy makers to promote the modernization and digital transformation of the legal service industry.

Keywords: financial technology, legal services, blockchain, smart contracts

1. Introduction

In the digital age, financial technology (FinTech) is reshaping the operational models of the financial and legal service industries with its unique influence. FinTech, which specifically refers to the use of technological means, especially information technology, to design, develop, and provide financial services, covers a range of innovative practices from mobile payments to blockchain, from online lending to automated financial advice. These technologies not only provide consumers and businesses with more convenient and efficient financial services but also have a profound impact on the legal service industry.

1.1 The Impact of FinTech on the Legal Service Industry

The impact of FinTech on the legal service industry is mainly reflected in the following aspects:

- 1) **Digitalization of contract law:** The emergence of smart contracts makes the automatic execution of contracts possible, reducing legal disputes in the traditional contract execution process.
- 2) Automation of compliance supervision: FinTech, through data analysis and machine learning techniques,

has improved the efficiency and accuracy of financial institutions' compliance supervision.

3) **Online dispute resolution:** Online dispute resolution platforms use FinTech methods to provide parties with faster and lower-cost dispute resolution methods.

1.2 Research Background and Importance

With the rapid development of FinTech, the legal service industry is facing unprecedented challenges and opportunities. On the one hand, legal service providers need to adapt to the new situation brought about by FinTech, updating legal knowledge and skills; on the other hand, the development of FinTech also provides new tools and methods for legal services, which helps to improve service efficiency and quality. (Crosman, P., 2016)

Studying how FinTech affects the legal service industry is of great significance for guiding the healthy development of the legal service industry, helping legal service providers adapt to technological changes, and providing decision-making references for policy makers.

1.3 Research Purpose and Questions

This study aims to explore the current status of FinTech in the legal service industry, the challenges it faces, and future development trends. The main research questions include:

- 1) How does FinTech change the traditional legal service model?
- 2) What are the specific applications of FinTech in the fields of contract law, compliance supervision, and dispute resolution?
- 3) What technical and legal challenges does the application of FinTech in legal services face?
- 4) How can FinTech tools be effectively integrated to improve the efficiency and quality of legal services?

By discussing these questions, this paper hopes to provide strategic suggestions for practitioners in the legal service industry and provide theoretical support and practical guidance for the integration of FinTech and legal services.

2. Overview of FinTech Tools

Financial technology (FinTech) refers to the use of technological means, especially information technology, to design, develop, and provide financial services. It encompasses a variety of technological applications and innovative models that are changing the way the financial industry operates and bringing new opportunities and challenges to the legal service field. (European Banking Authority, 2017)

2.1 Definition and Development of FinTech

Definition: FinTech is commonly defined as the use of technological innovation to provide financial services and products, aiming to improve the accessibility, convenience, and efficiency of financial services.

Development: The development of FinTech has evolved from early online banking services to today's mobile payments, P2P lending, blockchain, and cryptocurrencies, among other innovations. As technology continues to advance, FinTech is gradually permeating all aspects of finance, including but not limited to lending, insurance, investment, asset management, and payments.

2.2 Main FinTech Tools

- 1) **Blockchain:** Blockchain is a distributed ledger technology that shows great potential in financial transaction verification and smart contract execution due to its transparency, immutability, and decentralized characteristics.
- 2) Smart Contracts: Smart contracts are computer programs that automatically execute, control, or document legal events and actions. Their application in contract law can improve the efficiency and transparency of contract execution.
- 3) **Mobile Payments:** Mobile payment technologies such as Apple Pay and Alipay provide fast and secure payment methods, changing traditional payment and transaction methods.
- 4) **Automated Investment Platforms (Robo-advisors):** They use algorithms to provide investment advice and asset portfolio management services.
- 5) **P2P Lending Platforms:** They connect borrowers and investors through online platforms, providing decentralized lending services.
- 6) **Cryptocurrencies:** Such as Bitcoin, which provides a decentralized form of currency, challenging the traditional currency system.
- 2.3 Potential Applications of FinTech in Legal Services
- 1) Contract Law: Smart contracts can automatically execute contract terms, reducing the risk of default and

execution costs.

- 2) **Compliance Supervision:** FinTech, using data analysis and machine learning techniques, can help legal service providers conduct more effective compliance supervision and risk management.
- 3) **Dispute Resolution:** Online dispute resolution platforms can use blockchain technology to record and verify transactions, providing transparent and reliable evidence for resolving financial disputes.
- 4) **Intellectual Property Protection:** Blockchain can be used to record and verify the ownership and transactions of intellectual property, providing technical support for intellectual property protection.
- 5) **Data Security and Privacy Protection:** Encryption technology in FinTech can enhance data security and privacy protection in legal services.
- 6) **Legal Education and Research:** The development of FinTech provides new topics and tools for legal education and research.

These applications of FinTech are gradually changing the operational model of the legal service industry, bringing new opportunities for legal service providers, and also posing new challenges. As technology continues to advance and apply more deeply, the role of FinTech in legal services will become increasingly important.

3. The Application of FinTech in Contract Law

FinTech, especially blockchain and smart contract technology, is causing a revolution in the field of contract law. These technologies provide a new method for contract execution and verification, thereby addressing some long-standing challenges in traditional contract law.

3.1 Challenges in Traditional Contract Law

The challenges faced by traditional contract law mainly include:

- 1) **Execution difficulties:** Contract execution often depends on the goodwill of both parties, and once one party breaches the contract, the execution process is often time-consuming and labor-intensive.
- 2) **Complexity of verification:** Verifying whether the terms of the contract and transaction conditions are met usually requires the intervention of legal experts, increasing time and cost.
- 3) **Dispute resolution:** The resolution of contract disputes often requires going through courts or other third-party institutions, which is not only inefficient but also may involve high costs.
- 3.2 Working Principle and Advantages of Smart Contracts

Working principle: Smart contracts are computer programs that automatically execute contract terms stored on the blockchain. When the conditions specified in the contract are met, the smart contract automatically executes the corresponding terms without the intervention of any intermediary. (Gatteschi, V., Lamberti, F., Demartini, C., Pranteda, C., & Santamaria, V., 2019)

Advantages:

- 1) **Automation:** Smart contracts eliminate manual intervention when executing contracts, reducing execution time and cost.
- 2) **Transparency:** Due to the immutable nature of the blockchain, smart contracts provide a transparent and traceable record of contract execution.
- 3) **Security:** Once the code of a smart contract is deployed, it cannot be changed, ensuring the security and reliability of the contract terms.

3.3 Application of Blockchain in Contract Execution and Verification

Blockchain technology provides a decentralized, immutable record system for contract execution and verification. It improves the application of contract law in the following ways:

- 1) **Record keeping:** All contract terms and transaction records are securely stored on the blockchain, ensuring the integrity and verifiability of the records.
- 2) **Verification process:** Through the consensus mechanism of the blockchain, the process of contract execution and verification becomes more transparent and credible.
- 3) **Cost reduction:** It reduces the reliance on third-party verification services, thereby reducing the cost of contract execution and verification.

3.4 Case Analysis: Real Estate Transactions Using Smart Contracts

Case description: In a real estate transaction, the buyer and seller use smart contracts to automatically execute contract terms. When specific conditions are met (such as the buyer paying a deposit, completing the property

transfer procedures, etc.), the smart contract automatically releases funds to the seller and updates the property ownership records.

Analysis:

- 1) **Efficiency improvement:** The transaction parties do not need to wait for the cumbersome process of traditional bank transfers or property transfer procedures; smart contracts handle these affairs automatically.
- 2) **Fraud reduction:** Due to the immutable nature of the blockchain, all transaction records are transparent, reducing the possibility of fraud and misunderstanding.
- 3) **Trust enhancement:** The automatic execution mechanism of smart contracts enhances the trust between the transaction parties because the execution of the contract no longer depends on the integrity of any party.

FinTech, especially smart contracts and blockchain technology, provides an efficient, transparent, and secure method for contract execution and verification in the application of contract law. These technologies help address some long-standing challenges in traditional contract law, bringing new opportunities for the legal service industry. As technology continues to develop and mature, it is expected to play an increasingly important role in the field of contract law.

4. The Application of FinTech in Compliance Checks

The application of financial technology (FinTech) in the field of compliance checks, particularly in automating compliance checks and using data analysis to improve compliance efficiency, is changing the way financial institutions and legal service providers handle compliance tasks. (Kshetri, N., 2018)

4.1 Complexity and Costs of Compliance Checks

As financial products and services diversify, compliance checks are becoming increasingly complex. Financial institutions need to ensure that their operations comply with the ever-changing laws and regulations, such as Anti-Money Laundering (AML), Know Your Customer (KYC), and data protection regulations. These compliance tasks not only involve a large amount of paperwork but also require professional legal and compliance knowledge, leading to rising compliance costs.

4.2 Automated Compliance Check Tools

FinTech offers tools for automated compliance checks, which simplify the compliance process in the following ways:

- 1) **Automatic data collection:** Automated tools can integrate data from different sources to provide the necessary information for compliance checks.
- 2) **Intelligent document review:** Using Natural Language Processing (NLP) technology, automated tools can quickly review contracts and documents, identifying potential compliance issues.
- 3) **Risk assessment models:** Automated tools can apply machine learning algorithms to assess the risk levels of transactions and customers based on historical data and pattern recognition.

4.3 Using Data Analysis and Machine Learning to Improve Compliance Efficiency

Data analysis and machine learning technologies play a key role in improving compliance efficiency:

- 1) **Predictive analytics:** By analyzing historical transaction data, machine learning models can predict and identify suspicious transactions, providing early warnings of potential compliance risks.
- 2) **Pattern recognition:** Machine learning algorithms can recognize complex transaction patterns and behaviors, helping financial institutions to perform AML and KYC checks more accurately.
- 3) **Continuous monitoring:** Data analysis tools can monitor transaction activities in real-time, ensuring ongoing compliance rather than just checking at specific points in time.

4.4 Case Analysis: The Application of FinTech in Anti-Money Laundering (AML) Checks

Case description: An international bank has adopted a FinTech solution to improve its AML check process. The bank deployed a cloud-based AML compliance platform that uses machine learning algorithms to analyze transaction data, automatically identifying and reporting suspicious transactions.

Analysis:

- 1) **Efficiency improvement:** By automating processing and intelligent analysis, the bank significantly increased the speed and efficiency of AML checks.
- 2) Accuracy enhancement: Machine learning models improved the accuracy of identifying suspicious transactions, reducing false positives and false negatives.

- 3) Cost savings: Automated AML checks reduced the reliance on manual review, lowering compliance costs.
- 4) **Risk reduction:** Real-time monitoring and intelligent analysis help the bank to identify and respond to potential money laundering activities in a timely manner, reducing compliance risks.

The application of FinTech in compliance checks, especially in AML checks, demonstrates the potential of automation and data analysis technologies in improving compliance efficiency, accuracy, and reducing costs. As technology continues to advance, FinTech is expected to play an even greater role in the compliance field, helping financial institutions and legal service providers better meet compliance challenges. (Liu, J., Li, H., & Huang, W., 2020)

5. The Application of FinTech in Dispute Resolution

Financial technology, particularly blockchain technology and online platforms, is transforming the way disputes are resolved, offering parties more efficient and transparent solutions.

5.1 Limitations of Traditional Dispute Resolution

Traditional methods of dispute resolution, such as litigation and arbitration, often face the following challenges:

- 1) **Time-consuming:** The traditional dispute resolution process can be very lengthy, taking months or even years.
- 2) High costs: The costs of litigation and arbitration are usually high, including attorney fees, court costs, etc.
- 3) Lack of transparency: Non-public dispute resolution procedures may lack transparency, making it difficult for parties to track progress.
- 4) **Geographical limitations:** Geographic distance can be a barrier to resolving cross-border disputes.
- 5.2 Using Blockchain for Transaction Tracking and Evidence Collection

Blockchain technology brings new possibilities to dispute resolution:

- 1) **Immutable records:** Blockchain provides an unchangeable record of transactions that can serve as key evidence in the dispute resolution process.
- 2) **Transparency:** All transaction records are visible to participants in the authorized network, enhancing the transparency of dispute resolution.
- 3) **Smart contracts:** Smart contracts that automatically execute contract terms reduce disputes arising from misunderstandings or breaches of contract.

5.3 Online Dispute Resolution Platforms

Online dispute resolution platforms use technological means to simplify the dispute resolution process:

- 1) **Convenience:** Parties can easily submit disputes through online platforms, regardless of geographical location.
- 2) **Cost-effectiveness:** Compared to traditional dispute resolution methods, online platforms are usually much cheaper.
- 3) Efficiency: Automated processes and electronic communication increase the speed of dispute resolution.

Multi-party participation: Online platforms can accommodate more participants, including mediators, arbitrators, and legal advisors.

5.4 Case Analysis: Resolving Cross-Border Payment Disputes with FinTech

Case description: An international trading company had a dispute with an overseas supplier over a cross-border payment. Both parties agreed to use a blockchain-based online dispute resolution platform to resolve the dispute.

Analysis:

- 1) **Transaction tracking:** Through blockchain technology, both parties were able to track the transaction status in real-time, ensuring the accuracy and completeness of the transaction records.
- 2) **Evidence collection:** All transaction records are saved on the blockchain, providing reliable evidence for dispute resolution.
- 3) **Online mediation:** Through the online platform, both parties chose a neutral mediator for online mediation, avoiding the complexity of face-to-face encounters.
- 4) **Quick resolution:** Using the automated processes of the online platform, the dispute was resolved within weeks, much faster than traditional dispute resolution methods.

The application of financial technology in dispute resolution provides a more efficient, transparent, and

economical solution. The combination of blockchain technology and online dispute resolution platforms is particularly suitable for handling cross-border payment disputes, significantly improving the speed and reducing the costs of dispute resolution. As technology advances and becomes more widespread, it is expected that more dispute resolution cases will be handled using financial technology methods. (Mendelson, A., 2016)

6. Case Studies

Case studies provide profound insights into the practical applications of the integration of FinTech and legal services. The following are selected case analyses that highlight successful factors, lessons learned, and discuss their implications for the industry.

6.1 Case Study 1: Blockchain Application in Smart Contracts

Case Description: A global financial services firm has developed a blockchain-based smart contract platform to automate and optimize its international contract transaction processes.

Successful Factors:

- 1) **Transparency:** All transaction records are publicly transparent on the blockchain, increasing the trust in transactions.
- 2) Efficiency: Smart contracts automatically execute contract terms, reducing transaction time.
- 3) Security: The immutable nature of blockchain ensures the security of transaction records.

Lessons Learned:

- 1) **Technological Adaptation:** It is necessary to ensure that the design of smart contracts complies with legal requirements and business logic.
- 2) User Education: Users need to have sufficient understanding and trust in blockchain and smart contracts.
- 3) **Industry Implications:** Blockchain and smart contracts can significantly improve the efficiency and security of contract execution, bringing innovative solutions to the legal service industry.

6.2 Case Study 2: FinTech Application in Anti-Money Laundering (AML) Checks

Case Description: A large bank has used machine learning algorithms to enhance its AML checking system, effectively identifying and preventing suspicious financial activities.

Successful Factors:

- 1) **Predictive Analytics:** Machine learning models can predict and identify high-risk transactions.
- 2) Automation: Automated processes reduce the workload of manual review.
- 3) **Real-time Monitoring:** The system can monitor transaction activities in real-time, responding quickly to suspicious activities.

Lessons Learned:

- 1) **Data Quality:** The performance of the model depends on high-quality data input.
- 2) Legal Compliance: Technological applications must comply with AML laws and regulations.
- 3) **Industry Implications:** FinTech can improve the accuracy and efficiency of AML checks, but it requires high-quality data and strict compliance controls.

6.3 Case Study 3: Online Dispute Resolution Platform

Case Description: An online payment company has developed an online dispute resolution platform that allows users to resolve payment disputes through the platform.

Successful Factors:

- 1) **User-Friendly:** The platform interface is intuitive and easy to operate.
- 2) Efficiency: Most disputes can be resolved within days.
- 3) Low Cost: Compared to traditional legal avenues, platform fees are significantly reduced.

Lessons Learned:

- 1) Fairness: Ensuring the fairness of the dispute resolution process is crucial.
- 2) **Technical Support:** Strong technical support is key to the success of the platform.
- 3) **Industry Implications:** Online dispute resolution platforms provide a quick, low-cost solution for legal services, helping to simplify the dispute resolution process.

These case studies demonstrate the practical application and potential value of FinTech in legal services.

Successful factors often include technological advantages, user education, data quality, legal compliance, and technical support. Lessons learned emphasize the importance of technological adaptation, user trust, data management, and fairness. The implications for the industry are that FinTech can not only improve the efficiency and security of legal services but also reduce costs and enhance user experience. As technology continues to advance, the legal service industry needs to adapt and innovate to fully leverage the opportunities brought by FinTech. (PwC, 2017)

7. Challenges and Risks

The integration of financial technology, regulatory technology, and intellectual property protection is driving innovation in the legal service industry, but it also brings a series of challenges and risks. Here is an in-depth analysis of these challenges and risks:

7.1 Challenges of Technological Integration

Technological integration is a key step in achieving the synergistic effects of financial technology, regulatory technology, and intellectual property protection, but it is fraught with challenges:

- 1) **System Compatibility:** Compatibility issues between different technology platforms and systems can lead to integration difficulties.
- 2) **Standardization of Data Formats:** Inconsistencies in data formats used by different systems require unified standards to ensure smooth data flow.
- 3) **Technological Acceptance:** The varying levels of user acceptance of new technologies can affect the promotion and application of the technology.

7.2 Data Security and Privacy Issues

Data security and privacy protection are core issues in the application of financial technology and regulatory technology:

- 1) **Data Breach Risks:** With the increase in data volume, the risk of data breaches also increases, which can lead to serious financial losses and reputational damage.
- 2) **Privacy Protection Regulations:** Differences in privacy protection regulations across different countries and regions pose compliance challenges for financial institutions operating internationally.
- 3) User Trust: Data security and privacy issues may undermine user trust in financial technology services.

7.3 Legal and Regulatory Barriers

Uncertainty and complexity in the legal and regulatory environment are major obstacles to the application of financial technology:

- 1) **Regulatory Lag:** The rapid development of financial technology often outpaces the update of regulations, leading to regulatory lag and market uncertainty.
- 2) **Cross-border Regulation:** Differences in regulatory policies across countries impose additional compliance burdens on cross-border financial services.
- 3) **Legal Applicability:** Issues of legal applicability of smart contracts and blockchain-based transactions require further legal clarification and interpretation.

7.4 Risk Management Strategies

Effective risk management strategies are crucial to addressing the challenges posed by financial technology:

- 1) **Risk Assessment:** Conduct comprehensive risk assessments regularly to identify potential technological, compliance, and legal risks.
- 2) **Technological Security Measures:** Implement advanced technological security measures, such as encryption, access control, and multi-factor authentication, to protect data security.
- 3) **Compliance Framework:** Establish and maintain a robust compliance framework to ensure that business operations comply with all relevant laws and regulations.
- 4) **User Education:** Strengthen financial technology, regulatory technology, and intellectual property protection education for users to raise their awareness of risks and self-protection capabilities.
- 5) **Emergency Plans:** Develop emergency plans to respond to data breaches and other security incidents to minimize potential negative impacts.

The integration of financial technology, regulatory technology, and intellectual property protection brings significant benefits but also comes with challenges in technological integration, data security, legal regulation, and risk management. By adopting effective strategies and measures, these risks can be minimized, ensuring the

healthy development and widespread application of these technologies.

8. Conclusion and Recommendations

This paper provides an in-depth analysis of the application of financial technology in legal services and draws the following conclusions, along with corresponding recommendations.

Positive Role of FinTech: Financial technology has significantly enhanced the efficiency and quality of legal services by providing innovative tools and platforms. Technologies such as smart contracts, blockchain, and online dispute resolution platforms not only optimize contract execution, compliance checks, and dispute resolution processes but also reduce costs and time. (World Economic Forum, 2015)

Challenges Coexist: Despite the many benefits that financial technology brings, there are also challenges in technological integration, data security, legal regulation, etc. These challenges need to be overcome through the efforts of multiple parties.

Importance of Risk Management: Effective risk management strategies are crucial to dealing with the risks brought by financial technology. This includes risk assessment, technological security measures, compliance frameworks, and user education.

8.1 Recommendations

For Legal Service Providers:

- **Technology Adoption:** Legal service providers should actively adopt FinTech tools to improve service efficiency and quality.
- **Training and Education:** Strengthen training and education for employees on financial technology to enhance their understanding and application of these new technologies.
- **Risk Management:** Establish effective risk management mechanisms to identify, assess, and address risks associated with the application of financial technology.

For Technology Developers:

- User-needs Orientation: When developing FinTech products, focus on user needs to ensure that the products can solve practical problems.
- **Data Security:** Prioritize data security and privacy protection in product design to build user trust in the products.
- **Compliance:** Ensure that technological solutions comply with all relevant laws and regulations to reduce compliance risks.

For Policy Makers:

- **Forward-looking Policies:** Develop policies that support the development of financial technology while considering the rapid development and changes in technology.
- **Regulatory Sandbox:** Establish a regulatory sandbox that allows for testing of new FinTech products in a controlled environment to promote innovation and reduce regulatory risks.
- **International Cooperation:** Strengthen international cooperation and coordinate regulatory policies across different countries and regions to adapt to the global financial market.

8.2 Summary

The application of financial technology in the legal service industry has broad prospects, but it also faces many challenges. Through the joint efforts of legal service providers, technology developers, and policy makers, the potential of financial technology can be maximized while effectively addressing risks. By adopting the recommendations above, the innovation and development of the legal service industry can be promoted, improving the efficiency and quality of legal services and ultimately achieving the digital transformation of a broader socio-economic landscape.

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