



## FinTech: Technology, Financial Business Innovation and Challenge

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**SUMMARY:** *With the intelligence economic developing, FinTech has greatly promoted financial model innovation. Cloud Computing technology, Big Data technology, Artificial Intelligence technology and Blockchain technology are applied to financial industry, these advanced technologies continue to innovate in many fields of the financial industry, forming a diversified industrial chain that focus on financial business processes, greatly increasing financial services automation level, improving efficiency and bringing the solution to solve the trust problem. FinTech has gained rapid development and greatly promoted financial services, however, there also exist several challenges, for example, financial regulatory policy lags behind, FinTech has limited development level, personal information security encounters increasing risks, the financial technology industry sustains lack of talent and so on. Based on above issue, we propose some corresponding policy suggestions: improving regulatory policy to adapt to FinTech innovation, utilizing RegTech to promote financial regulatory efficiency, accelerating improvement of relevant laws and regulations, improving the talent training system, coordinating multiple parties to optimizing the environment of FinTech industry and so on. We hope that these policy suggestions can help to solve the problems, and contribute to FinTech exerting positive effect, promoting sustainable and healthy development.*

**KEYWORDS:** *FinTech; Financial Innovation; Industry Chain; Challenge; Policy Suggestions*

## 1 Introduction

With the continuous development of financial technology (FinTech), the ongoing breakthroughs and sustained innovations in emerging technologies such as cloud computing, big data, artificial intelligence, and blockchain have been deeply integrated with financial services, laying the foundation for innovation in financial business models, products, and services [1]. As an example, Internet credit rating, online lending, and precise marketing are few areas where technologies of cloud computing and big data are extensively used. Semantic analysis and machine learning are artificial intelligence technologies that have been successful in easing the automatization and efficiency of financial operations. The blockchain technology has brought in innovations in solving the problem of trust [2, 3].

FinTech is a complex of these new technologies that allows it to become innovative in financial models, service improvements, and is used in many areas, such as payments, lending,

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insurance, wealth management, securities, banking, and credit reporting [4]. The ecosystem of the financial industry has been revised with the help of this integration of developing a new financial model that should be inclusive and efficient and encouraging the innovative approach to financial business models and the improvement of provided services.

The innovations in new financial technology have significantly helped to enhance innovation in financial sector, which has influenced financial institutions to lay a high emphasis on the development of FinTech and elevate it to strategic level [5]. Concurrently, governments have been proactive in putting policies to be implemented to promote FinTech. Nevertheless, the emergence of financial technology at an exceptionally high rate has also come with its own issues. We also provide the relevant policy solutions to enhance the healthy growth of the FinTech sector.

## 2 The Development of Financial Technology

Financial technology (FinTech) is a combination of finance and information technology (IT). It enables the old fashion financial institutions to be enabled by technology, which revolutionizes the products and services being offered by them, radically changing the conventional business models of the financial industry, and chewing down efficiency and operating costs. FinTech brings technologies like mobile internet, cloud computing, big data, artificial intelligence, and blockchain to the financial industry to solve the problem of information asymmetry, spatial and temporal constraints, and security concerns [6, 7]. FinTech fulfills the financial requirement of businesses and people of the new economy era by capitalizing on the technological solutions, thus spurring off a fast-developing economy.

As the technology develops, financial technology (FinTech) has reached a new phase of value innovation through the new technologies of cloud computing, big data, artificial intelligence, and blockchain, which started the transformation of internet finance model. Internet finance was largely based on the internet technology, which innovated the financial services via internet and mobile internet connections. Among the important areas of application were [8]: internet and mobile payments, financial supermarkets, P2P lending, wealth management platforms, and crowdfunding platforms. These inventions minimized the business models and intermediaries, and thus, boosted fund matching effectiveness. Nevertheless, that was not referring to the technological design of the financial product.

Conversely, recent technologies like cloud computing, big data, artificial intelligence, and blockchain have outpaced the internet finance by incorporating latest technologies in the fundamental aspect of the financial performance. The technologies allow the data mining and customer profiling with the help of big data and the digitization of assets [9, 10]. These involve modernizing the financial infrastructure by digitalization of assets and money, as well as innovation in the asset management and financial infrastructure. The outcome of this process is that it is able to price assets efficiently and accurately, enhance resource allocation efficiency of assets, and finally optimize resource allocation. The processes undertaken by financial services have been enhanced considerably through the technological alteration and innovation. The following applications are now seen as important: asset digitization, smart lending, cross-border payments, digital currencies, robo-advisors, supply chain finance, and robotic analysts.

### 3 Emerging Driving Technologies in Financial Technology

#### 3.1 Cloud Computing

Cloud computing is the foundation of big data, artificial intelligence, and blockchain and is part of the backbone of the digital society and, therefore, the financial ecosystem. It provides an efficient way of integrating more information systems in the financial sector, thus providing the necessary technological platform to operate them [11]. Through provision of cloud computing services, enormous volumes of operational information created by users is amassed. Using this information, businesses are able to provide value-added services including customer profiling, precision marketing and help users to streamline operations within the business. Calculation formula for load balancing degree:

$$LB = \frac{1}{n} \sum_{i=1}^n \frac{R_i}{C_i} \quad (1)$$

where,  $LB$  represents load balancing degree,  $n$  is the number of servers,  $R_i$  is the current load of the  $i$ -th server,  $C_i$  is the maximum processing capacity of the  $i$ -th server. This formula is used to measure the degree of load balancing among servers in a cloud platform. The closer the  $LB$  value is to 1, the more balanced the load is.

The formula for calculating the cost reduction rate is as follows:

$$CR = \frac{C_{\text{before}} - C_{\text{after}}}{C_{\text{before}}} \times 100\% \quad (2)$$

where,  $CR$  represents the cost reduction rate,  $C_{\text{before}}$  is the cost per unit of business volume before adopting cloud computing, and  $C_{\text{after}}$  is the cost per unit of business volume after adopting cloud computing. This formula is used to visually demonstrate the effectiveness of cloud computing in reducing costs.

The cloud computing platform supports and manages all internal information systems within financial institutions, connecting these systems and centralizing their data onto the cloud platform for internal data management [12, 13]. Cloud computing utilizes virtualization technology to transform physical IT equipment into a pool of IT resources, and employs X86 servers and disk arrays. Through the use of a cloud operating system, it achieves load balancing, effectively reducing costs and improving the efficiency of equipment usage. Additionally, the platform adopts data redundancy fault tolerance methods and interchangeable computing nodes to ensure system reliability. The cloud platform also supports the addition of servers and storage, ensuring scalability to meet growing demands and capacity requirements. The regulatory module of the cloud computing platform centrally manages servers, storage, and network devices through the operating system, ensuring a high level of automation in operation and maintenance.

The cloud computing platform is a safe, reliable, and effective platform, which offers scalability of computational and storage facilities to handle the upcoming technologies like big data and artificial intelligence that are founded upon the foundations of cloud computing.

#### 3.2 Big Data

Big data is the category of data that is extremely large in relation to what is possible with the conventional database software tools in data acquisition, storage, handling, and analysis. It is

distinguished by four primary characteristics which include low value density, heterogeneous data structure, enormous amounts of data and high data turnover [14]. The technology of big data involves a number of technologies such as data storage, data collection, data computation, data mining and data visualization.

Some of the technologies on which the big data platform is based include the Hadoop/Spark computing infrastructure, and it is based on open-source systems and open-global ecosystem. These systems are flexible and adaptable to the parameters that can be changed as per the real requirements. Through data integration and data mining on the big data platform, organizations are able to perform cost effective data processing experience of general purpose technological architecture, powerful data computing functionality and linear scalability [15].

Big data technology can be used alongside data warehousing to develop a central data platform to businesses. It enables the unstructured, structured and streaming data to be analyzed and the costs managed during the design phase. The technology of big data allows the management and analysis of data available, which makes a reality of analysis of all available analyzable data. The formula for calculating the accuracy of data mining is as follows:

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN} \times 100\% \quad (3)$$

where,  $TP$  (True Positive) represents the number of samples that are actually positive and predicted to be positive;  $TN$  (True Negative) represents the number of samples that are actually negative and predicted to be negative;  $FP$  (False Positive) represents the number of samples that are actually negative but predicted to be positive;  $FN$  (False Negative) refers to the number of samples that are actually positive but predicted to be negative. This formula is used to measure the accuracy of data mining model predictions.

The formula for calculating the efficiency improvement rate of data processing is as follows:

$$EE = \frac{E_{\text{before}} - E_{\text{after}}}{E_{\text{before}}} \times 100\% \quad (4)$$

where,  $EE$  represents the efficiency improvement rate of data processing,  $E_{\text{before}}$  represents the processing time per unit of data before adopting the big data platform, and  $E_{\text{after}}$  represents the processing time per unit of data after adopting the big data platform. This formula is used to reflect the improvement effect of big data platforms on data processing efficiency.

The scale, analysis speed and data structure have been changing rapidly after more years of exponential growth in data accumulation. Bigger data are constantly becoming bigger, their dimensions are constantly increasing with the aid of advanced technologies, the models of big data are constantly optimized and erased, and at the same time.

The financial industry has a great potential of application of big data technology. It allows developing the more precise representation of the customer profile and makes it possible to follow the targeted marketing strategy [16, 17]. The big data platforms increase the efficiency of operations of the financial institutions and offer more capabilities in the area of risk management. Also, big data is used in detecting fraud by identification and credit assessment, credit reporting, and predictive analytics.

### 3.3 Artificial Intelligence

The artificial intelligence (AI) is affecting production and everyday life to an increasing extent. AI is based on big data, and its application has already been observed in other areas, including economics and finance. Indicatively, researchers wrote in Nature that they were able to predict the Dow Jones Index by applying sentiment analysis obtained through the use of the Twitter platform and thereafter opened the first ever hedge fund based on the social media data in Europe. Wealthfront is an intelligent investment advisory company used in the United States that uses AI to examine the risk preference of investors [18]. It re-allocates the assets across the globe through algorithmic trading to select relevant exchange-traded funds (ETFs).

By applying human-machine system of collaborative service model, Capricorn Investment chooses the globally available public mutual funds to diversify its investment risks. In the sphere of intelligent lending, AI technology examines user behavior and evaluates their willingness and capacity to repay the loan by analyzing it and issuing users with necessary credit limits as well as allowing full automation of online lending to increase risk management efficiency. Moreover, the Kensho robot analyst can scan 90,000 global economic and political events, analyze and evaluate how given events can influence particular stocks and industries.

The formula for evaluating the impact of an event, assuming that event E has an impact on stock S, can be evaluated by constructing a multiple linear regression model:

$$S_t = \alpha + \sum_{i=1}^m \beta_i E_{i,t} + \epsilon_t \quad (5)$$

where,  $S_t$  is the price or other related indicators of stock S at time t,  $E_{i,t}$  is the characteristic variable of the i-th event at time t (such as the intensity of the event, correlation with the stock, etc.),  $\alpha$  is the intercept term,  $\beta_i$  is the regression coefficient of the characteristic variable of the i-th event, and  $\epsilon_t$  is the random error term. By estimating the regression coefficient  $\beta_i$ , the impact of different events on stock prices can be quantified, and the influence of events can be evaluated accordingly.

Artificial intelligence (AI) can be described by the convergence of the three main factors, namely, the amassing of big data, the elements of high-performance computing, and the improved realization of the deep learning algorithm. The following bountiful progress in deep learning, speech recognition, image recognition, and other affiliated technologies has boosted the AI development progressively. Massive data processing has come into existence as a result of big data and cloud computing who have significantly increased the power of computers [19]. An intelligent automation has been facilitated by the growing trend of contextualization and digitization of business activities. Besides, capital markets have played a positive role in creating viable AI business models through favourable policies and investment.

In the financial sector, AI applications include intelligent investment advisory services, smart lending, and robo-analysts, among others.

### 3.4 Blockchain

Blockchain is a distributed registry, a system which is built upon computer code and relies on the computer code and is decentralized. It employs digital identification tools, which help to monitor transactions, which makes the process of ownership transfer of assets secure and transparent, as well as traceable ownership of assets. The distributed ledger developed by blockchain is decentralized, which uses cryptographic methods to synthesize data blocks connected to each other in chronological order and compose numerous nodes [20]. All the

system information exchange data are stored in every data block and before attaching data block to the next related ones are checked as to their authenticity by the use of cryptography.

The privacy of the users is preserved without the assistance of third parties, as blockchain network nodes are decentralized and cryptographic technology, in turn, allows preserving the privacy. It supports successful authentication, relaying and decentralized information storage. Information inputted into the blockchain distributed ledger is transmitted and stored throughout the network, and consensus is reached throughout the system and the blockchain becomes resourceful against human manipulation. Blockchain has a decentralized nature such that the system is, however, secure and functional in cases where individual nodes are hit or rendered ineffective. Blockchain offers the best platform through which data and information can be recorded because of its immutability, transparency, decentralization, anonymity, and self-governance [21].

Blockchain represents a combination of some already existing technologies, the main ones being P2P network technology, cryptography, timestamps, and decentralized consensus algorithms. The cryptographic and the decentralized algorithms of the blockchain are the assurances of privacy and security of transactions, in addition to the efficient performance of the system and a significant reduction in the intermediary fees. The blockchain distributed storage and propagation globally model make data hard to manipulate hence guaranteeing the integrity and disclosure of information by all parts of the network [22]. This facilitates monitoring and confirmation of transaction data, which will be useful when it comes to problems of information authenticity. The degree of decentralization that is manifest in the system also means that the security of the whole network is not jeopardized, in case individual nodes are attacked, thereby protecting data sustainability and security.

Blockchain has a programmable scripting which makes every transaction within the blockchain system, execute scripts and convert them into programmable smart contracts. Such contracts may include the purpose and direction of funds hence control the market order. The various attributes of blockchain made it a major game-changer in the world of finance, cybersecurity, supply chain management, and similar industries.

Blockchain is safe, trustworthy, and decentralized in the financial industry and has become the support technology of digital currencies. It also facilitates peer-to-peer transactions, eradicating mediators and limiting expenses and risks. The security is highly improved when the distributed data storage technology is used. Blockchain is able to provide real-time changes in clearing and settlement operations with multi-node consensus and traceable information. The financial sector will be empowered on both layers which will be the application and the technical layer. Its finance applications are: commercial bill trading, supply chain finance, credit reporting, asset securitization, asset trading, insurance, payments, clearing, and settlement.

## 4 Application Domains and Industry of Financial Technology

Financial technology (FinTech) is a combination of technology and finance, using such innovations as the internet, cloud computing, artificial intelligence, and blockchain within the financial services industry. Through mobile gadgets, social media, and distributed ledger technologies, FinTech is ever in a position to innovate the business models, which contributes to the financial sector in terms of minimizing of expenditures, augmenting revenues, and customer-side effectiveness [23]. FinTech has essential areas of application, these are data and analytics, payments, blockchain, insurance, trading and investments, processes and compliance, lending and crowdfunding, security, etc.

By way of constant innovation in technology and business models of service delivery,

FinTech has created a new business and market, and over time, these will constitute segments of the industry. It assists in breaking the structural barrier of the traditional financial institutions, streamlines financial business operations, and enhances the customer satisfaction of the financial users. Table 1 shows the application areas of financial technology.

*Table 1: Application areas of financial technology*

Main Application Areas	Sub-Sectors
Data and Analytics	Big Data Solutions, Predictive Analytics, Data Visualization, Big Data Credit Scoring, etc.
Payments	Mobile Payments, Payment Processing, Credit Cards, Prepaid Cards, etc.
Blockchain	Digital Currencies, Blockchain Payments and Settlement, Supply Chain Finance, Asset Trading, Blockchain Protocol Development, etc.
Insurance	Risk Management, Brokerage, Underwriting, Claims Processing, etc.
Trading and Investment	Trading Platforms, Trade Pricing, Investment Management, Robo-Advisory, etc.
Processes and Compliance	Customer Relationship Management, Business Process Automation, Supply Chain Management, Compliance, etc.
Lending and Crowdfunding	Mortgage and Business Loans, Personal Lending, Crowdfunding Platforms, etc.
Security	Fraud Prevention, Cybersecurity, Data Encryption, Digital Identity Verification, etc.

Financial technology (FinTech) represents a new industrial form that integrates technological innovations with new business models in the financial sector, driving innovation and development in areas such as transaction mechanisms, asset characteristics, and organizational structures. The technological advances that are in question are the developments in distributed ledger technology, cloud computing, mobile internet, artificial intelligence, communications technologies, and the Internet of Things. Financial innovation, in its turn, refers to the shift in the nature of business in the spheres of private equity, insurance, banking, securities, and asset management.

Under the new organizational business model enabled by FinTech, significant improvements in financial functions are achieved, particularly in areas such as financial risk management, investment and financing channel management, resource allocation, asset pricing, capital appreciation, and transaction security. Table 2 shows the classification of the fintech industry.

Table 2: Classification of the FinTech industry

Primary Category	Secondary Category	Tertiary Category
Infrastructure	Core Technology Service Providers	Traditional IT Services
		Financial Big Data
		Artificial Intelligence
		Blockchain
	Information Services	Accounting Tools
		Financial Search Tools
Portal and Terminal Services		
Credit Financing	Credit Services	Personal Credit
		Corporate Credit
	Consumer Finance	
	Online Microloans	
	Cash Loans	
	Supply Chain Finance	
P2P Lending		
Internet-based Electronic Banking		
Electronic Payments	Third-Party Payment	PC-based Internet Payments
		Mobile Payments
		Card Acquiring (POS)
	Aggregated Payments	
	Cross-Border Payments	
Digital Currencies		
Wealth Management	Financial Product Sales Platforms	Fund E-Commerce
		Non-Standard Products
		Comprehensive Platforms
Internet Securities	Financial Asset Exchanges	
	Robo-Advisory	
	Securities Brokerage	
Internet Insurance	Equity Investment	
	Internet-Based Insurance	
	Insurance E-Commerce	
Others	Credit Derivatives	
	Online Crowdfunding	
	...	

China's FinTech industry has developed into a diversified industrial chain centered around financial business processes, forming a complete ecosystem encompassing asset acquisition, asset generation, capital matching, and scenario integration. Regarding the aspect of acquiring assets, big data technology is utilized in accurate marketing and forecasting of the industry. Credit services are also practiced using big data on fraud prevention, joint risk supervision, credit verification, and model construction, and the extensive information aggregation is referred to measure the quality of assets. Under the asset generation step, using the assistance of core systems, the financial institutions use their in-house facilities to render business services and form joint credit alliances. The credit resource sharing between the

financial institutions, the data analysis to formulate the models, and the extraction of the margin reserves based on the default rates in order to ensure the credit lines of the banks are also included during this stage. During the capital matching stage, FinTech provides profound Fed to IT systems to drive automation [24]. This allows investment channels to automatically align with user funds and offers intelligent financial models like robo-advisory, quantitative investment, customer relationship management and high-frequency trading. FinTech is now being used in the following fields, namely, in the context of biometric identification, payments and settlement systems, logistics monitoring, embedded into ERP and CRM, thus becoming a powerful tool to increase the efficiency of the financial world management.

The FinTech sector is defined by the high growth rates of technological innovation due to their active development of new technologies in the innovation sphere: cloud computing, big data analytics, artificial intelligence and machine learning, blockchain distributed ledger and encryption technologies. Through these developments, financial services in areas such as banking, securities and insurance can be analyzed and broken down. FinTech fulfills the needs, experience, and participation of the users through the use of the interactive opportunities of the smart mobile devices as well as the collection and analysis of the large volumes of data. It streamlines the procedures and products, continuously optimizing and updating them, and expanding business models, product lines, and service products as well. The outcome of this is the being able to provide goods and services at very low costs, with high efficiency, with high value-added, and with a high degree of convenience, with diversification and differentiation in prices which increases the integration of financial business processes, enables quick and precise financial decision making and efficiency in operations within the financial sector. Figure 1 shows the ecological map of China's fintech industry chain.

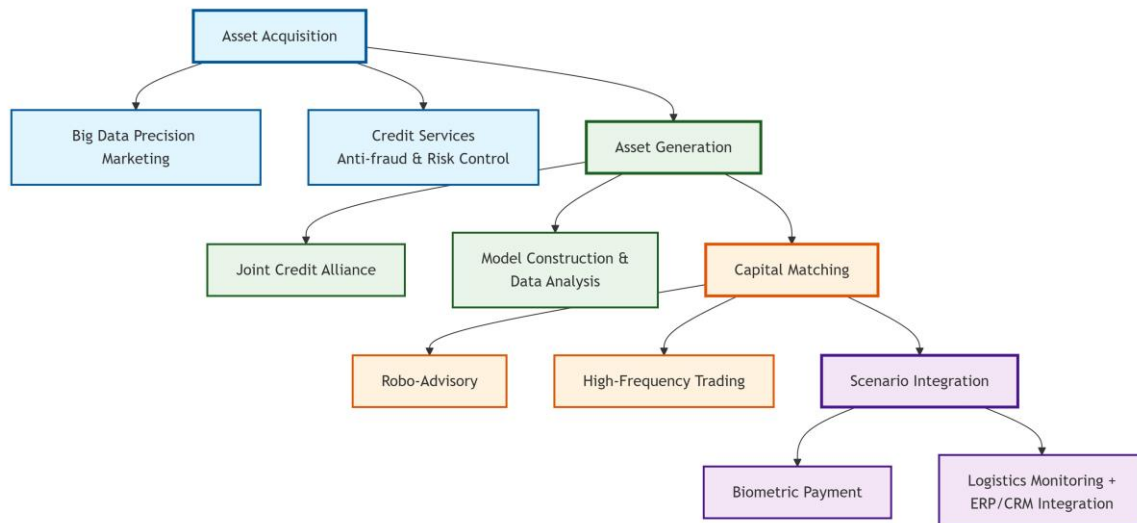


Figure 1: Ecological Map of China's Fintech Industry Chain

In financial lending services, platform-based models directing the demand and supply sides of capital have already been made possible through the FinTech technology without necessarily having intermediaries between the demand and supply sides. This makes it easy to conduct disintermediation and decentralization and, in the process, enhancing financial efficiency and minimizing costs. In addition, the close interconnection of financial industry and technology in the FinTech sector has transformed the information processing and decision-making cycle of the financial sector [25]. This has greatly contributed to the

effectiveness of the delivery of services in areas like wealth management and financing of investments so that a broader group of market participants (small and medium-sized enterprises SMEs and people without formal credit histories) are beneficially impacted by the conveniency of financial services, leading to financial inclusion.

## 5 Challenges Faced by the Development of FinTech

Although advanced technologies such as internet technology, cloud computing, big data, artificial intelligence, and blockchain have provided FinTech with vast prospects for application and have driven continuous innovation in financial business models, products, and services, they also present unprecedented challenges.

### 5.1 Lagging Regulatory Policies: A Race Between Regulation and Innovation

FinTech has also presented a set of advanced financial service models, which have spurred growth in the industry in a short period. It has though not come up with similar risk management measures and this has augmented risks and posed regulatory hurdles. Concurrently, the regulatory conditions have been playing behind the curve, whereby policy loopholes have been easily abused to carry out some illegal practices, which can be associated with huge losses. We have already seen the failure of numerous P2P lending sites, dishonest "runaway" problems, and the outburst of problems among internet finance firms, incurring significant losses to the participants. In the early days, third-party payment systems had a direct connection model, connecting directly to the bank ports, and settling funds between the bank accounts. This created the operation of high amounts of payment funds that were not under regulated and this became a major challenge to the anti-money laundering (AML), financial supervision and monetary policy implementation. A balance between innovation and regulation is deemed as a critical issue [26]. FinTech innovation advances at a fast rate whereas regulatory frameworks fall behind. The causes of this regulatory lag are twofold: on the one hand, the nature of the industry and market of FinTech makes sticking with the conventional sector-specific regulatory patterns rather difficult; on the other hand, the emergence of the FinTech sector has caused the financial transactions to become more frequent and more complexes, which makes regulatory challenges a continuous repeated problem.

### 5.2 Limitations in the Development of FinTech Itself

Although FinTech can radically revise the old financial sectors and create new business models that cannot be reproduced using the existing technologies, the fact remains that nowadays the level of technologies is not high enough to facilitate the further evolution of these emerging financial models. Besides, the issue of challenging the traditional financial institutions that FinTech cannot overcome easily is very difficult to fix. As an example, the implementation of the blockchain technology has rapidly increased, but technical challenges are still considered the major obstacle to its massive acceptance. The problem of performance constraints, system malfunctions, and unexpected vulnerabilities is one of the key barriers to the use of blockchain in the financial industry. Equally, as the concept of smart lending has experienced progress in innovation and efficiencies within the various channels, which have provided channel innovation, and efficacy, the technological innovations within core products such as asset generation, and liquidity have taken time to percolate.

The use of FinTech has enormous opportunities; nevertheless, the process of creating

technological standards and introducing technologies into practice is long-term and on the same basis. The process of proving the maturity and stability of the FinTech applications to the market will take long. In addition, after the technology has matured, it still has to ensure that it gains two notches namely in the market and regulatory authority. Every new technology that is presented by FinTech can become a threat to the current traditional forms of business. Since the age requires the new technological advancement, it is crucial to push the FinTech towards more serious development.

### **5.3 Increased Risks to Personal Information Security**

Using big data technologies, FinTech is able to aggregate, analyze and store large volumes of data to facilitate novel services like user profiling, digitizing assets, and precise marketing. Although these developments play a very positive role in the degree of financial digital services, they equally present a threat to the security of individual financial information.

Originally, common threats are 1. data breaches and 2. fraud. The statistics in China UnionPay (2016) Online in the Mobile Payments Survey report indicate that 64 percent of sampled people had used their mobile numbers to open various types of accounts which included consumer, financial and social accounts. This was higher than the average when over half of them had encountered telecom fraud resulting in the loss of money [27].

Second, traditional financial enterprises have been overwhelmed by a big number of non-traditional financial businesses that have expanded the avenues of usage of personal financial information. Nevertheless, these non-traditional enterprises tend to look at making profits and improving value and minimal investments in security measures. This has increased the chances of leakages in personal information, availing chances to gain illicit access and exploitation of personal information.

Third, the combination of the latest FinTech tools with the financial sector has brought about novel financial innovation paradigms, which greatly exceed the legal frameworks. The regulatory policies are behind their time and the loopholes in the currently available regulations can be used by ill-intentioned parties to steal and sell personal financial data.

### **5.4 Talent Shortage in the FinTech Industry**

The most important resource of the development of FinTech is talent. The ongoing progress of FinTech calls upon the incorporation of the knowledge and abilities in several fields, such as the internet technology, finance, and IT, across various industries and fields. This produces a pressing need of interdisciplinary, multi- background, and highly diverse professionals. Nevertheless, although traditional academic programs in higher education are largely disconnected with the current requirements of the market, it is essential to address the issue of talent requirements of the FinTech sector.

In the future, the talent shortage in FinTech will likely be significant, whereas the number of highly trained professionals is not enough to boost the growth of the industry and the use of advanced technologies. Meanwhile, the talent management and incentive systems in the traditional financial institutions are not developed. A lot of companies do not provide the environment of technological innovation and do not take sufficient investments in talent development. Financial professionals have very few career mobility opportunities in technical positions, promotion systems are inflexible, compensation systems are low, and professionals have no autonomy and motivation. The issues render it hard to draw in and keep the most important talent and to remain abreast with the dynamic and ever-changing world of innovation in the industry.

## 6 Policy Recommendations

Regarding the problems and issues of the FinTech development, it is necessary to refer to the efforts of exploration on a global scale and take into account inimitable features of the domestic industry. The system of countermeasures should be properly organized, depending on the requirements and situation in the country.

### 6.1 Actively Adjust Regulatory Policies to Adapt to FinTech Innovation

The current innovation that is being witnessed in progress of FinTech demands the creation of a dynamic equilibrium between regulation and technology. Based on the national background, it is necessary to seek regulatory approaches that the country should develop in terms of FinTech. There are two regulatory models that would serve as helpful reference points; the restrictive regulatory model, as used in the United States, and the proactive regulatory model, as implemented in the United Kingdom and Singapore.

The restrictive model of regulation assimilates FinTech into the current financial regulatory frameworks depending on its common financial features and functions of received financial services. An instance in point is that in the United States, securitization of assets over peer-to-peer (P2P) lending platforms are under the purview of the US Securities and Exchange Commission (SEC).

Conversely, the proactive regulatory model is one that introduces strategies like the regulatory sandbox whereby the FinTech innovators can pilot operate in a controlled setting. The government in this stage tracks this process and analyzes the outcomes to see whether to receive official regulatory approval and expand the innovation out of the sandbox [28]. As an example, the regulatory sandbox model in use in the UK allows regulators to know, experiment, and evaluate the financial innovations at the same time analyzing the risks involved. It also offers the liberty of making changes in the regulatory rules where needed so that policies do not interfere with the interests of innovation and consumers. This is a strategy that encourages innovative financial services allocation in a regulated risk environment.

Fundamental innovation regulation should not be very distant to market forces and this ensures that it responds and intervenes on time before they suffer regulatory lags. As multiple industries and markets can be under the jurisdiction of FinTech, China is now regulated at the level of sectors. Nevertheless, it is also essential that China uses the experience of other nations and changes the regulatory models corresponding to the specifics of the Chinese FinTech market, finally providing a sustainable regulatory framework.

### 6.2 Leveraging RegTech to Enhance Financial Supervision Efficiency

The use of the latest technologies to support the regulation and compliance of services is called regulatory technology (RegTech). With the invention of such technological innovations as big data, artificial intelligence (AI), blockchain, the list of tools that can be used to monitor the financial situation on the market has become quite extensive that allows tracking market fluctuations and warning about risks and responding to them in time.

The sheer pace of FinTech innovation has revealed the shortcomings of the familiar sector-based model of regulatory approach, which is becoming less effective to meet the cross-sectoral and cross-marketal vistas of new financial innovations. Conversely, RegTech, which uses these new technologies, offers an all-encompassing penetrative regard to supervision. It enables to monitor main business processes in real time, attentively follow the dynamics of risks, and make corrective actions in time. This technology facilitates multi-layered and complete monitoring of financial services or products including business

operations, capital flows as well as information.

An example is that it has been shown that some RegTech solutions built on blockchains have been created to detect anti-money laundering (AML) operations. These systems can distinguish a customer with a suspicious account by studying the cryptographic digital currency addresses of customers to produce financial risk analysis reports.

The further development of the RegTech will enhance the efficiency of financial supervision to a considerable degree and allow adopting a more comprehensive and structured strategy toward addressing financial risks. This will be able to protect the healthy growth of the financial industry.

### **6.3 Accelerating the Improvement of Relevant Laws and Regulations**

With information security being one of the concerns that have become more frequent due to the continuous innovation of FinTech, the risks of compromising the personal data security have become very common. There is a dire need to enact laws and regulations that will specifically provide protection to personal information, reinforce actions that protect such information and punish the illegal gathering, acquisition, and exchange of personal information.

The urgent necessity is to become the driving force in implementing the legislative procedure, which should design regulations and mechanisms directing the authorization, sharing, circulation, transaction, and usage of data. There must be legal provisions that can shed light on how to create, transfer, and end ownership of data, as well as enhance the security of the rights on data. When the actions or actions are against the ownership of data or when it jeopardizes the security of the information, there should be clear rules about discretion and punishment [29].

Moreover, regarding the new services and products resulting out of the FinTech, there is an urgent need to fast track law and regulation in the new business models and new business services, e.g., in relation to the payment and settlement systems, online lending, and other new financial operations. The importance of improved and advanced legal and regulatory framework concerning FinTech should be focused on to safeguard the rights of consumers, as well as provide an adequate legal environment of thriving FinTech in the country and the proper functioning of the financial sector.

### **6.4 Deepening Talent Development Systems to Propel the Growth of the FinTech Industry**

Although the implementation of the FinTech is rapidly expanding and poses strong opportunities towards it, there is also a severe lack of skilled labor. First, the promotion of the cooperation between academia and industry is needed, which will strictly unite all the academic research works of universities with the technological inventions of the major FinTech companies. Different approaches are needed to recruit and develop luxury talent in FinTech industry that facilitates the development of industry leaders and youthful and excellent talent in the industry.

Second, it is crucial to actively promote the exchange of technology and talent within the international FinTech ecosystem. Broad international collaboration should be fostered, drawing on advanced global experiences while fully utilizing both domestic and international FinTech resources and advantages.

Third, colleges must be assisted in enhancing the growth of fields associated with new technologies that include cloud computing, big data, artificial intelligence (AI), blockchain, and the Internet of Things (IoT). Universities can also promote the long-term development of

FinTech by peppering up professionals in these sectors to have high skills and quality.

When dealing with the structural unemployment brought about by development of FinTech, it is advisable to advise the universities and industry training institutions to provide vocational training programs in consistent with the needs of the new FinTech industry. This will assist in moving the excess numbers of labor in productive activities to maintain a constant flow of high skill levels talent to aid in the further development of the FinTech industry.

## 6.5 Coordinating Multiple Stakeholders to Optimize the Development Environment for the FinTech Industry

The proper growth of the healthy FinTech industry involves the involvement of several actors, i.e., government departments, industry players, and enterprises. First, there is the necessity of enhancing and increasing the level of coordination at all the tiers of the government, systems, enterprises, and individuals. This consists of enhancing the creation of the related FinTech laws, regulations, and industry standards, one should support self-regulation in the sphere of FinTech, develop the industry standards, and also refine the industry regulations [30].

Second, policy support should be increased to guide the industry. The government and market should collaborate to channel funding from multiple sources, encouraging the growth of domestic FinTech companies. This will help ensure that the country keeps pace with global technological advancements, enhancing core FinTech capabilities and building a secure, resilient, inclusive, and efficient FinTech ecosystem.

Third, better cooperation of government agencies with businesses must also be promoted, and the focus should be made on risk prevention. The development of the research should proceed to the use of the latest technologies, including big data, artificial intelligence (AI), and blockchain, in such fields as financial security and risk control. A detailed structure regarding the identification, evaluation, and control of risks related to FinTech must also be created and a risk monitoring and early warning network. It will increase the risk prevention and mitigation capabilities, minimize the risk of systemic risks and possible crises.

## 7 Conclusion

FinTech has contributed to the innovation of financial services, as well as revolutionizing and modernizing financial designs, which are bootstrapping the development of an inclusive and efficient financial ecosystem. Enterprises and individuals do not have a weak range of investments and financing options. FinTech has provided the financial industry with more capacities, which have made it more efficient in providing ways of increasing the flow of capital and assets and made it more efficient in terms of assets pricing and handling financial hazards. Consequently, due to their technological innovations, small and micro-enterprises, and the general population are able to take advantage of the new financial services offered, which fosters the efficient distribution and use of capital.

In addition, FinTech has enhanced resource optimization in the allocation in the economic development in the financial sector. The strong financial system is paramount to the sound and swift development of the national economy, and it is the key to the economic performance of the country.

Simultaneously, the difficulties encountered in the development of the FinTech should also be given considerable attention. Such problems should be mitigated as they occur, and the focus should be placed on intensifying the risk management process, averting the possible crises, and making sure that FinTech comes into the financial innovation with a positive and

proactive role.

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