

Original Paper

Low Carbon Consumer Lending Fintech Product Design Report

Lilong Lv¹, Chen Yang^{2*} & Zhao Cai²

¹ School of Finance, Anhui University of Finance and Economics, Bengbu, China

² School of Management Science and Engineering, Anhui University of Finance and Economics, Bengbu, China

* Chen Yang, School of Management Science and Engineering, Anhui University of Finance and Economics, Bengbu, China

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Abstract

In short, green growth will play a central role on the road to a more resilient recovery, and financial technology will be a key driver. Fintech, as an essential support in building a green financial system, will play a key role in supporting green finance to serve the real economy more efficiently.

This article focuses on the design of low-carbon consumer credit as a financial technology product, given the high costs of green transformation for businesses and the financing and credit risks they face. Through big data, cloud computing, machine learning and other technologies, the product will help businesses to go green, create value for users and bring positive energy to society. In response to the national “dual carbon” target, low-carbon consumer credit will become an important driver to foster the development of emerging industries. This design differs from generic financial technology products in that the design focuses on green, economic benefits, while taking into account corporate social responsibility, and the use of machine learning to create an anti-fraud system throughout credit risk management, loan withdrawal, and detection of all aspects to ensure maximum security for users.

Keywords

green finance, ‘double carbon’ target, machine learning, green financial technology products

1. Design Background

Global warming is increasingly serious and has become an issue of concern to the international community (Methmann, 2013). As we know, it has seriously affected the human environment and natural ecology, leading to a significant decline in agricultural production, imbalance of water resources and serious damage to the ecosystem. It is conceivable that this has a serious impact on the sustainable development of human civilisation. There are many causes of climate warming, the most important of

which is carbon dioxide emissions caused by human activities (Friedlingstein & Solomon, 2005). Due to the large population, carbon dioxide emissions have a significant impact on global warming. Based on this, all countries gradually realise the importance of low-carbon life and low-carbon consumption, and begin to implement relevant policies and take relevant measures.

In recent years, China's economy has developed rapidly, people's living standards have improved, and people's material and spiritual pursuits have been higher and higher. As people's consumption is getting bigger and bigger, consumer loans can meet people's needs in a timely manner, and more and more people are using consumer loans. The population using consumer loans in China is gradually growing, and people's demand for consumer loans is also increasing.

China's consumer credit market is gradually expanding and the market size is expected to increase from \$13 trillion in 2019 to \$24 trillion in 2025 due to the gradual increase in consumers' willingness to spend, according to research data from Oliver Wyman. With the rapid development of science and technology, consumer loans have gradually shifted from offline to online, that is, online consumer loans, as cloud computing, artificial intelligence and other technologies continue to be strengthened (Xia et al., 2021). This is in response to the "dual-carbon" policy recently issued by the Japanese government, which realises "zero" carbon emissions, and online consumer lending makes lending more convenient and environmentally friendly. In response to national policies, the team is committed to designing financial technology products - low-carbon consumer loans, adopting a fully online mode, to achieve "zero" carbon emissions, our design is to create a low-carbon consumer loan platform to lay the foundation.

2. Design Ideas

2.1 Intelligent Variable Model, Flexible to Fit the Demand

Considering the actual situation and use effect, the team adopted the hierarchical analysis method (AHP) to create a mathematical model for applicant credit approval, and analyse from both qualitative and quantitative perspectives.

Considering the different situations of different fintech companies and applicants, the indicator weights need to be changed during the evaluation. The team set the indicator weights as variable items, so users can input different indicator weights according to different situations. This makes the model more flexible and accurate. At the same time, in order to ensure the objectivity of the results, the machine learning training model is used for uniform judgement. By inputting data, building models, and training feedback, accurate results will be generated.

After the user sets the subjective weight according to actual needs, the machine learning model outputs objective data. The model fits the user's needs well, maximising accuracy and flexibility.

2.2 Man-machine Cooperation and Progress, the Theory and Reality of Harmonious Integration

In the past, machine learning often exists in the theoretical effects and actual needs of the difference is too large, pay improper input and so on. People always think of letting the machine "stand alone", but ignoring the machine is just a tool for people to deal with problems. To solve this problem, the team

emphasised the concept of human and machine collaboration in the machine learning module. Machines replace humans to deal with repetitive and tedious work, humans use the time saved to do more meaningful work, and macro control of machines, humans and machines to communicate with each other, so that the results achieve the best state.

3. Product Introduction

3.1 Loan Application

Users get the corresponding level, according to their own needs to apply for the loan category, the platform provides the loan amount, loan mode and loan period and other types of loan information. After the user's selection and authorisation, the wind control factor of the mobile phone customer's loan will be submitted to the background for intelligent wind control and verification. In the review of wind control factors at the same time will be carried out review and review of user information, through multiple review mechanisms to ensure trust between institutions and lenders.

3.2 Lending Process

After all the audits are passed, the information will be uploaded to the cloud service terminal, in the lending process, the project uses third-party cloud services, on the one hand, through an intelligent cloud platform to optimise traditional loans in a cumbersome process, while completing the single-point mode of layer-by-layer examination and approval, after the examination and approval of the loan by the lender directly to the applicant's account; on the other hand, innovatively put forward the financing of the loan supply chain, and through the platform and big data wind control Connect banks, factoring, funds, securities and other financial institutions, to combine industrial and financial modes for enterprises or individuals to inject loan-specific liquidity, to solve the problem of loan mismatch in the process of business operation, as well as personal loans in the operation of the problem, to protect the interests of the applicant.

4. Technical Analysis

4.1 Machine Learning Technology

In the process of face recognition, data processing, automatic response and other processes, it is necessary to use machine learning technology, which saves manpower by handing over repetitive mechanical work to machines. At the same time, through the continuous accumulation of data and the mature machine learning system, the processing results of the machine are becoming more and more accurate. Considering the actual situation and application effect. The team selected the human-machine cooperative machine training model for the project construction method, and selected the BP algorithm and LR algorithm for the project construction algorithm.

4.2 Face Recognition Technology

Considering the principle of "zero tolerance" for "old bastards", the team set up a facial recognition function in the user registration process. With the help of face recognition technology, the facial features

extracted from users are compared with the “blacklist” in the database, so as to improve the overall creditworthiness of users from the source. At the same time, it adopts the Convolutional Neural Network (CNN) algorithm, which has advantages in continuous learning and optimisation, and has strong applicability and adaptability. This algorithm can continuously learn and optimise itself.

4.3 Intelligent Risk Control System

Intelligent risk control focuses on big data, algorithms, and computing power, and emphasises the correlation between data. Traditional financial institutions use “strong features” such as rule engines for risk assessment, while intelligent risk control evaluates user risks based on “weak features” such as performance records, social behaviour, behavioural preferences, identity information, and device security. These two types of risk control methods show obvious differentiation effects from operation to scenario, and after entering the mobile Internet era, the advantages of intelligent risk control are increasingly prominent, becoming an effective complement to traditional risk control (Long et al., 2019).

5. The Next Iteration of the Product

A good product is always based on actual needs and constantly makes changes to maximise the benefits of the product. The team proposed the following three ideas for the next iteration of the product after the product has been in use for some time.

5.1 Improve Adherence Desensitisation Information and Docking Capability

By improving compliance desensitisation information and docking capabilities, we can help our partners to complete independent approval and timely publishing. The complexity of the project business and the frequent interaction between front-end and back-end information make it easy to leak sensitive information. If sensitive customer information is leaked, it will cause customer loss and reputational impact on the project. Any function point that involves the display of sensitive customer information. This is a sensitive point. The team provided two solutions for this situation. First, js code should reduce unnecessary comments to avoid exposing too much business logic, to prevent sensitive information leakage, new features on the validation test version can be compressed js code or in the development stage to reduce unnecessary business logic comments; Second, the transaction development process, developers should return to the page according to specific business scenarios or corresponding data channels, to avoid the return of redundant data fields. In addition, for ID card numbers, card numbers, mobile phone numbers or emails and other sensitive customer information, it is necessary to desensitize.

5.2 Improved Hierarchical Analysis Model and Machine Learning Model

The Hierarchical Analysis Model is a more complete tool for evaluating candidate solutions in terms of multiple evaluation criteria and evaluation performance. In the context of this project, in order to improve the hierarchical analysis model of the project, the selection of assessment criteria and weighting decisions should be considered, which is based on the fact that respectively due to the lack of qualitative data support for the two factors, and the comprehensive consideration of multiple interrelated factors is prone to errors. First of all, these two factors need to be artificially determined and controlled. In addition, the

hierarchical analysis model can be improved by establishing, building a stepwise hierarchical model with all the judgement matrices at each level by hierarchical single sorting, hierarchical total sorting, and consistency test.

Improving machine learning models requires timely testing and comparison of model effectiveness. Timely intervention in the process of machine learning. If the gap between the data results is too large, the basic model in the neural network should be replaced, if the gap is small and changes in one direction, the weight of the LR algorithm should be changed reasonably.

5.3 Improve Post-loan Management

Quality post-loan management is an important part of ensuring user experience. This project will focus on loan management in the following aspects.

5.3.1 Focus on Post-loan Checks

After loan disbursement, the system will conduct comprehensive daily checks and special checks on borrowers and guarantors. Through guarantee-related factors such as business operations, account fund flow, etc. To conduct uninterrupted tracking checks or unscheduled inspections

5.3.2 Focus on Collateral Management

After the issuance of the loan, we need to focus on the guarantor's management and the guarantor's ability to guarantee and analysis of the guarantee tracking. And through these factors to analyse and assess the safety of the loan. Monitoring and management of collateral and guarantee certificates, guarantor management, guarantee supplementary mechanism are all important parts of guarantee management.

5.3.3 Focus on File Management

Firstly, confidential treatment of customer files is the basis of file management. Second, change the file information in time according to the actual situation to ensure the authenticity and validity of each customer's information, which will not affect the financial behaviour of subsequent users.

5.3.4 Loan Maturity Management

This project starts from the two conditions of time and amount, and sets the standard and severity of the delinquent account. Depending on the level, different collection methods are performed. According to the collection unit, collection can be divided into automatic collection and manual collection. If the level is less serious, automatic collection is selected, and if the situation is serious, manual collection is adopted, such as short call collection, collection agency collection, and other methods.

6. Product Advantages

6.1 Online Green Publishing, Realising "Zero" Carbon Emission

The country puts forward the "double carbon" policy, advocating low-carbon green life. Our financial technology products are the answer to the national policy call, low-carbon consumer loans are the entire online consumer loans, no pollution, no emissions, both energy saving and environmental protection, to achieve "zero" carbon emissions. Low-carbon consumer loan products in realising green environmental

protection at the same time to ensure economic benefits. The country put forward the “double carbon” goal, this product to better respond to national policies, will provide low-carbon consumer loans for those who carry out corporate green transformation or individual green consumption, to give them preferential treatment.

6.2 Intelligent Services to Improve Product Timeliness

Our products conduct in-depth analysis of data and users through technological means such as artificial intelligence and big data to achieve intelligent services. At the same time, it can expand the dimensions of access to ESG data and information, improve timeliness, enhance pre-prediction capabilities, conduct trend research, reduce human input, and provide more objective, transparent, and consistent services for the evaluation of corporate ESG factors.

6.3 Improve the ESG Evaluation Model and Enhance Product Risk Management Capabilities

Our products have improved the ESG evaluation model for green financing entities, aiming to achieve automation and comprehensiveness as well as one-stop identification for ESG evaluation for green financing entities and green enterprises. The rational use of ESG evaluation tools will improve the accuracy of predicting the future performance ability of credit customers and strengthen the risk management ability of the product itself.

6.4 Advanced Technical Support Ensures Data Accuracy

Our products use big data, cloud computing and other technologies. Cloud computing has a high degree of flexibility and reliability and other characteristics, with strong computing power. Big data can perform distributed deep mining of large amounts of data, and the simultaneous use of the two ensures the reliability and accuracy of data and the security of online transactions.

7. Feasibility Analysis

7.1 SWOT Model Analysis

SWOT model analysis is to arrange several trend factors, such as internal strengths and weaknesses, external opportunities and threats in the form of a matrix by listing, and then adopt a more systematic analysis method to link various factors together and make a systematic analysis, and then obtain a conclusion.

7.1.1 Advantage Analysis

Focuses on the internal strengths of this product, which can be roughly divided into the following points: Advantages of the service situation: Our product, a low-carbon consumer loan, is operated entirely online. This product realises “zero” carbon emissions, makes it easier and more efficient to conduct consumer loans, and ensures economic benefits while being environmentally friendly.

Data Excellence: Our products use cloud computing, big data, artificial intelligence and other high-tech technologies. The team sets indicator weights as variable items, and users input different indicator weights according to different situations, so that the model becomes more flexible and accurate. In order

to ensure the objectivity of the results, the machine learning training model is used to uniformly assess the system. By inputting data, building models, and training feedback, accurate results will be generated. Security Advantages: Our product consumer loan application process uses face recognition technology, data security is guaranteed by face recognition and I use the party to jointly ensure that the use of project verification has a set of security verification system, through the blink of an eye and turn their heads and other ways to determine the accuracy of face recognition, a person according to their own account, fundamentally eliminate theft brush brush wrong brush situation. And our product application process is more rigorous, there are multiple decision-making processes, all of which ensure data security.

Technical advantages: our products use advanced technologies such as human-machine collaboration, cloud computing, big data, artificial intelligence, face recognition, blockchain and so on. Through these technologies, the accuracy and security of the products are guaranteed, thereby improving the loanworthiness of online consumers.

Price Advantage: The product is free to download and use with no handling fees, and all we earn is the technical fees involved.

7.1.2 Weaknesses Analysis

Lack of independent database: this project mainly uses its own system design and conception and other forms of face recognition and other technologies to obtain accurate data so that borrowers and lenders can understand each other's supply and demand to form a more convenient behavioural system, but the ownership of the database does not belong to the company, on the one hand, it will aggravate the cost of service provision, and on the other hand, it will also cause our dependence on the database.

Project perfection: online consumer loans were initially formed, the demand survey work is relatively imperfect, there are still shortcomings in the systematic analysis of market demand and competitors, and there is still a long way to go in terms of grinding with the market and understanding customer demand. Based on the above analysis, the advantages of this product are not obvious compared with other systems that have been developed and improved many times. In practice, the service model of this project also needs to be improved.

Cost capital: this product is a low-carbon consumer loan, which needs to grasp a large amount of data and be accurate, and requires the support of many technologies, which will cause certain costs, and will bring certain disadvantages to the project that is new to the market.

7.1.3 Opportunity Analysis

The survey shows that there is a growing demand for consumer loans, and traditional offline consumer loans are not environmentally friendly. China's carbon emissions are increasing, the country announced the "double carbon" policy advocating low-carbon green living. Our low-carbon consumer loans are a timely response to the national low-carbon policy. The whole process of online consumer loans realises "zero" carbon emission. It is environmentally friendly, convenient and highly efficient.

To achieve China's green and sustainable economic goals and its climate commitment to carbon peaking and carbon neutrality, it will require trillions of yuan of green investment every year, of which

government financial resources can only afford 10-15%, and the huge amount of investment relies on the participation of social capital, which brings huge investment opportunities for the development of green financial markets. As China's green financial system continues to improve and develop, the demand for fintech will also grow. Fintech can provide cost-effective, accurate and efficient technologies and services in green identification, risk management, environmental and climate benefit measurement, credit evaluation and many other fields in the development of green finance.

At present, China's online consumer loans are in the early stage, low-carbon consumer loans need a lot of high-tech technical support, because of the driving force of people's consumption will, China's consumer loan market is getting bigger and bigger, and the prospects for low-carbon consumer loans are even more promising (Adrian, 2015).

7.1.4 Threat Analysis

Our products need a lot of technology, but there are still some technologies that are not very mature, in the future, there may be high-end technologies adapted to our products, there may also be better products to replace our products.

Our products need technical support, which means our products need a lot of capital. At the same time, consumer loans require a large amount of accurate data, which is provided by data companies, and there may be fierce competition, which will increase the technical cost of our products.

7.2 Analyse Product Feasibility Based on Industry Background

The country advocates low-carbon green life, green and environmentally friendly financial technology products, in response to national policy requirements. In the development and use of financial technology, China is the world leader, green financial innovation and development through financial technology to promote, in carbon emissions above China's standards, urgently need low-carbon financial technology products.

According to the survey, the green financial technology ecosystem in China is constantly developing and refining, and the application scenarios of financial technology products are very broad. Fintech products are applied in ESG investment and financing, green building, national carbon market trading, green consumption, small and micro enterprises, and green agriculture.

Financial technology is widely used in environmental data, environmental benefit measurement and risk detection, information sharing, and credit information management systems of financial institutions.

Green fintech products also serve a wide range of clients, mainly serving financial regulators, enterprises, government agencies, and individual users. Our fintech product, low-carbon consumer loans, mainly caters to individual users, i.e. it is used for personal consumer loans.

For now, the proportion of the Chinese population using consumer loans is relatively large, and its market size cannot be ignored. According to the survey, although the proportion of the population using consumer loans is quite large, but there are still too many adults who do not have credit cards, and the market size is gradually expanding. All this shows that low-carbon consumer loans are fully feasible.

8. Discussion

In short, our products use a relatively large amount of modern technology, which ensures the accuracy of data and the security of online transactions, making online transactions possible. Low-carbon consumer loan products achieve “zero” carbon emissions, compared with traditional offline consumer loans, environmentally friendly and economical. With the growing demand for consumer loans in China and the country’s promotion of green and low-carbon living, our products have a comparative advantage in the competition with similar financial technology products.

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