

Design of Tobacco Integral Exchange System based on Blockchain Technology

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Abstract. Issuing points is an important means for tobacco companies to promote the sales of tobacco products and cultivate users' awareness of traceability. However, each tobacco company's points system is independent of each other. The total amount of points in the consumer account is high, but it is very fragmented. Lead to low usage points. Blockchain technology can create a credible trading system at low cost by virtue of smart contracts, decentralization, and data tampering. Based on the current status of tobacco enterprise integral system, this paper designs a tobacco integral exchange system based on blockchain technology through blockchain technology. Achieve integral aggregation between different tobacco integration platforms. Can effectively improve the ease of use of tobacco points.

Keywords: Blockchain, Tobacco, Integral Exchange System, Blockchain Technology.

1. Introduction

Enterprise credit is a marketing method issued by a production company to give back to consumers and increase the viscosity of consumer users. Through enterprise points, consumers can redeem corresponding goods or user rights under the application scenarios specified by the company. The distribution of this marketing method through points can effectively improve the loyalty of members, provide new consumption methods for members, provide new promotion methods for businesses and enterprises, help to increase the visibility of businesses, and establish the competitive advantage of the points alliance. Therefore, the phenomenon of point marketing is not uncommon in the consumption process.

Tobacco companies rely on their financial advantages, and their production and sales informatization development ranks among the leading enterprises in manufacturing. As a fast-moving consumer goods industry, in order to improve consumer brand loyalty, protect consumers' legitimate rights and interests, and prevent counterfeit products, tobacco enterprise points is also an important marketing tool for tobacco companies. Incentives are used to motivate consumers to use anti-counterfeiting traceability. After using the product anti-counterfeiting traceability function, consumers will get certain points incentives. When the points accumulate to a certain extent, through the tobacco enterprise points mall, consumers can redeem and purchase designated products through points consumption. Smokers have obtained a certain degree of preferential use of tobacco points, and tobacco companies have increased their sales through point marketing.

However, due to the wide variety of tobacco products and the independence of tobacco companies, the points system of each tobacco company is independent of each other, which leads to the dispersal of points in the hands of consumers. The points in the points system of each tobacco enterprise are difficult to aggregate, and the points are difficult to use. It directly leads to consumers not being able to effectively enjoy the rewards of tobacco companies, and it is difficult for the points issued by enterprises to be effectively converted. Therefore, how to improve the utilization rate of points and aggregate the independent and scattered points is of great significance to the point marketing of tobacco enterprises.

2. Generalized Integration Platform Status

The concept of universal points appears in developed countries such as Europe and the United States. It is led by a certain subject business, and a point-based alliance merchant system based on universal points is established to realize resource sharing and common development. Each developed country and region have a running universal points platform, the most representative of which is the UK's nectar universal points. Joining through nectar points, attracting many merchants including banks, supermarkets, shopping malls, gas stations and so on. Consumers who use the bank credit card that joins the nectar platform will receive points based on the payment amount. The points can be consumed and exchanged at all affiliated merchants, and the nectar platform maintains the platform operation by charging the enterprise credit service fee. The total business of the Nectar Universal Points Platform has accounted for 40% of the total business of the UK merchants. At the same time, the merchants have effectively increased the income level of the company and enhanced the competitiveness of the company by joining the nectar universal points platform.

In recent years, with the improvement of the consumption level of Chinese residents, the universal integral platform has also appeared one after another. For example, Jingdong Steel Co., Ltd. issued by Jingdong Financial Co., Ltd. integrates the points system of banks, businesses and stores to realize the points of each merchant and Jingdong Steel Proportional exchange, the "Jingdong Steel Reel" that has been redeemed can be consumed in Jingdong Mall in accordance with the ratio of one Jingdong Steel Co., Ltd. to RMB 1. Through the docking enterprise integration platform, the scattered points of each enterprise are docked and aggregated, which reduces the threshold of using the points and effectively improves the circulation efficiency of the points.

The production and marketing of tobacco companies in China are independent of each other, so each tobacco company has established an independent tobacco integration platform. But for consumers, there are many types of tobacco scores. At the same time, the value of a single category in the hands of consumers is low, and each tobacco point system is independent of each other, making it difficult to aggregate consumption. This directly affects the circulation and use efficiency of the points, and the integral mall is ineffective. Referring to the model and characteristics of the existing universal point platform, it is meaningful to integrate the scattered points of the tobacco enterprise through the establishment of the tobacco point exchange platform and the integration of the tobacco enterprise points system.

3. Characteristics of Blockchain Technology

Blockchain technology is a kind of application exploration of computer technology such as distributed storage, point-to-point transmission, consensus mechanism and encryption algorithm. Its core technologies include distributed ledgers, asymmetric encryption, consensus mechanisms, and smart contracts. Through the above technologies, it is possible to effectively ensure that the data on the blockchain is transparent, the data is authentic and reliable, the information on the chain is traceable, and the information system with high credibility can be established with low credit cost.

After more than ten years of development, blockchain technology is widely used in asset trading, information storage, product traceability and other scenarios due to its decentralization, non-tampering, and authentic information. Blockchain technology is applied in the field of quotation and exchange. The advantage is that once the legal points are successfully issued, their subsequent circulation and consumption can be completed through smart contracts. Therefore, the blockchain technology can effectively improve the quotation efficiency and improve the utilization of the points.

4. Design of Tobacco Point Exchange System

The purpose of the tobacco point exchange system is to break the information barrier between the systems, to achieve the integration of tobacco scores among various platforms and enterprises within the tobacco system, and to achieve a large and diverse tobacco integration application. In order to achieve the goal of increasing the point circulation rate and reducing the difficulty of using points.

The use of blockchain technology intelligent contract, non-tampering, decentralization and other characteristics, to ensure the traceability of the entire process in the circulation process, to provide a credible trading environment for the circulation, circulation, and aggregation of tobacco points.

4.1 System Function Design

The point exchange system based on blockchain technology connects various participants through blockchain technology, including point issuer, point earner, point redemption party, etc., between each participant (point winners may not need) based on role and trust. The alliance chain system is jointly formed, and the point exchange system on the alliance chain platform satisfies the following functions:

1. Account management features. A digital identity account established on the blockchain uniquely identifies each account based on a private key and a digital signature mechanism, and the account has a blockchain integration attribute.

2. Points distribution function. In the intelligent contract of the blockchain, the point issuer can issue points according to certain vouchers, including tobacco point marketing contracts, sales orders, and the like. Each issuer can issue different types of points according to its business attributes; the points issued on the blockchain have attributes that can be traced and cannot be tampered with, and other attributes can be specified for the points through smart contracts, such as the expiration time of the points and others. Attributes, etc. The points management rules formulated in the smart contract cannot be tampered with after being released, and are transparent to each participant;

3. The point trading function can support the transfer of points between different accounts at the intelligent contract level;

4. Points redemption function, you can convert points into general points according to the redemption rules set in the smart contract;

5. Points exchange rate management function, in the smart contract can receive external parameters to update the point exchange rate, each time the management record of the point exchange rate will remain in the blockchain to deposit certificates;

6. In the point destruction function, there are two kinds of destruction mechanisms for the points. One is to automatically destroy the points after they expire, and the other is to complete the redemption and settlement after the points are completed.

7. The point inquiry function, the distribution, circulation, exchange and management records of the points will be left in the blockchain to leave the record of the deposit and traceable. The point destruction record can also be queried. For example, if the actual actual acceptor and the issuer are not an entity, the point acceptor can make a final business acceptance to the issuer through the point destruction record.

8. Points consumption function. The points exchange platform docks the points malls of various tobacco companies, providing consumers with access to tobacco companies' points. At the same time, it operates the General Points Platform Mall to facilitate consumer spending and use of universal points.

4.2 System Page Function Design

According to the functional requirements of the integral exchange system, the design system functions are divided into consumer end, enterprise user end and platform operation end.

For the consumer side, first of all, to provide a point exchange platform account registration interface, in order to manage the consumer's point rights. Provide a tobacco credit account login interface to bind the consumer's existing tobacco enterprise credit account. Provide tobacco points and platform points exchange interface to achieve the aggregation of scattered tobacco points, used in aggregate. Provide universal point mall and various tobacco enterprise points mall interface to facilitate consumers to participate in point consumption. Provide points consumption, exchange record query interface and deposit certificate interface, to facilitate consumers to query the source and destination of points. The consumer credit usage process is shown in Fig.1.

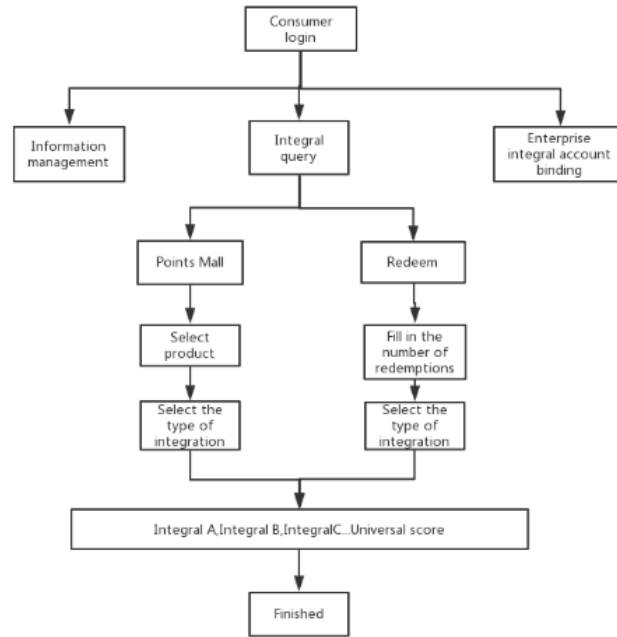


Figure 1. Consumer credit usage flow chart

For the enterprise client, you first need to provide the blockchain account and private key. Using asset accounts and private keys, companies have the ability to issue points on the blockchain. Provide a point redemption interface. When the tobacco enterprise points are converted into platform universal points, the general points will be issued on the blockchain according to the exchange rate by destroying the tobacco points; when the general points are converted into the tobacco enterprise points, the platform will be destroyed by destroying the blockchain. Points, the company points are issued according to the exchange rate. Provide a point account settlement interface. When the tobacco company and the point exchange platform perform account settlement, the tobacco enterprise and the point exchange platform are assisted in the settlement of the point assets by deriving the point redemption record on the blockchain.

For the platform operation terminal, a point exchange statistical system is provided to facilitate enterprises to check the credit exchange status of each tobacco enterprise. Provide a statistical display page of tobacco companies' exchange records, which is convenient for the platform to formulate a point marketing strategy. Provide the enterprise exchange record inquiry system to facilitate the point exchange platform to assist the enterprise to complete the account settlement.

4.3 System Architecture Design

Based on the blockchain technology, a point exchange platform is established. Each node in the alliance chain is composed of financial institutions that join the integration platform, including the point issuer, the point application party, and the point acceptor. The alliance chain is operated by the trading platform enterprise. After each node consumes the enterprise points according to the exchange rate, it can issue certain universal points and pay the general platform account. When a consumer makes a purchase through the Universal Points Store, the points in the Universal Points Platform account will be destroyed. When a consumer redeems tobacco points through the Universal Points Store, the Universal Platform account pays the corresponding Universal Points to the Tobacco Point Account based on the exchange rate. When the tobacco company and the general score platform perform account settlement, the settlement of the points is performed through the generation and circulation records of the general points on the blockchain. The integration platform module is shown in Fig.2.

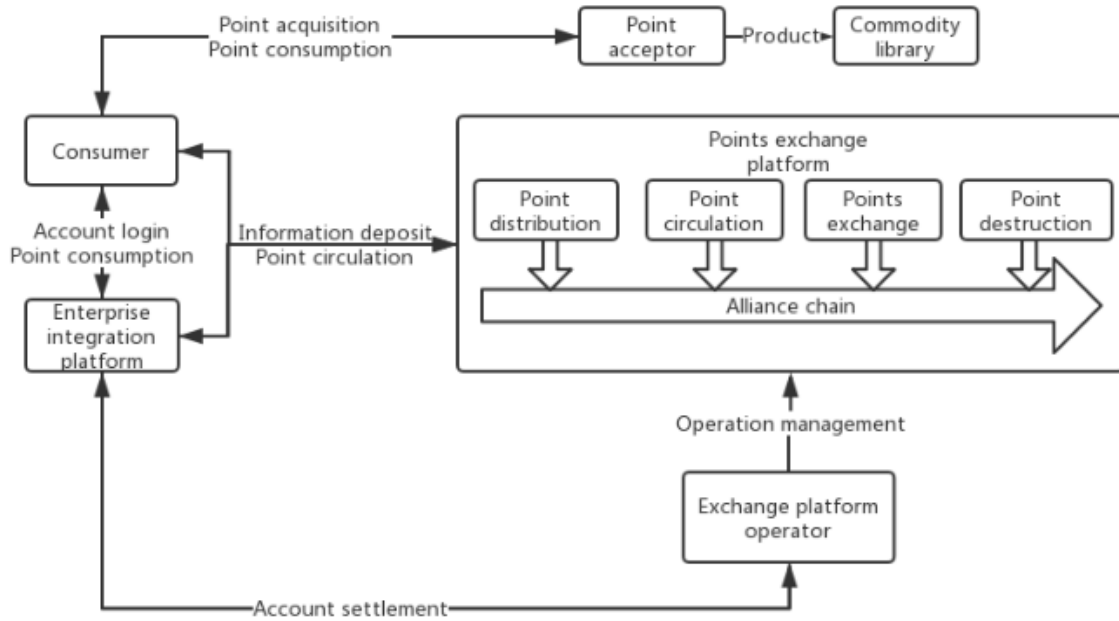


Figure 2. Integral platform module schematic

As the underlying technology of the integral exchange system, the blockchain needs to develop the point distribution, circulation and query interface for tobacco companies. When a consumer converts a business point into a platform universal point, it needs to complete the point issuance and circulation operation through the point exchange interface of the tobacco company. Conversely, when the consumer converts the universal points into the tobacco enterprise points, the integral circulation operation on the blockchain needs to be completed through the point circulation interface of the point exchange platform. System architecture design shown in Fig.3.

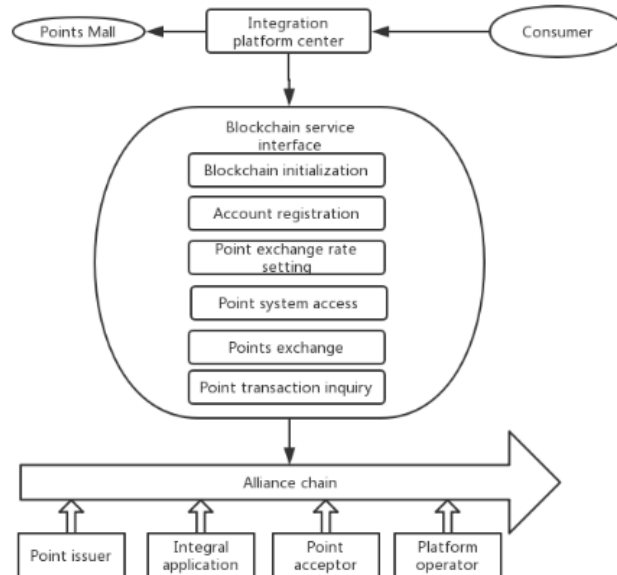


Figure 3. System architecture design

In the system background development process, it is necessary to encapsulate the standard API interface, which is convenient for tobacco companies to rely on standard API interface development and access to the integral exchange system and blockchain. When the consumer uses the corresponding function, it needs to call the system interface of the corresponding function providing organization, and simultaneously display through a webpage, an APP, a program, and the like.

5. Conclusion

By studying the characteristics of the Chinese tobacco enterprise integral system, this paper finds that the existing integral system has the characteristics of scattered, low circulation rate and difficult to use. By studying the characteristics of the integral exchange system at home and abroad, combined with the technical advantages of the blockchain, a set of integral exchange system based on blockchain technology was designed. The system can effectively dock the tobacco enterprise points system. Through the blockchain technology, build a low-cost, highly credible point trading system. The realization and application of the integral exchange platform can effectively improve the circulation efficiency of tobacco enterprises and improve the operating results of tobacco enterprises. Support for the application of blockchain technology.

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