

Research on Product Interaction Design and Application of Digital Currency Payment System

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Abstract:

In order to expand the communication channels and knowledge popularization channels of digital currency, promote the pilot application of digital currency, focus on solving social weaknesses, develop intelligent interactive design products for digital currency payment systems, and provide a new idea for the promotion of digital currency. Through the preliminary research, we understand the market demand and user demand and the current status of digital currency, analyze the current stage of digital currency research and the pain points of product development and application, and conduct an in-depth analysis of it. In order to meet the needs of the government, the digital currency application technology and intelligent interactive products are combined under the design concept of convenience and benefit to complete an innovative payment carrier.

Keywords:

Digital Currency, Intelligent Interactive Design Products, Innovative Design

1. Introduction

With the steady progress of digital currency, digital currency will be widely used in China in the future, and the integrated design of “digital currency payment system + interactive products” will constitute the theoretical basis of a new generation of electronic consumer products for “new technology application”. The carrier based on theoretical research has not only become an intelligent platform for popular science digital currency, but also optimized the payment operation platform. Therefore, the research of the Project provides reference value for the research of digital currency application carrier from the national level; stimulates consumption while meeting consumer demand from the economic level; provides sample data for the integration and development of new technologies from the technical level. Finally, according to the research direction, we design a set of interactive service products based on new technology, which is forward-looking. Therefore, the Project is of great value and significance to the theoretical research on product interaction design and application under digital currency payment system.

2. Research Status and Problems

2.1. Application Status Analysis

Central Bank Digital Currency is a kind of digital cryptocurrency which is not only a sovereign currency with complete monetary function, but also a credit currency with important policy nature and can be divided into different types according to different attributes. [1] The launch of DC/EP will increase market competition, reduce marketing costs, improve payment efficiency and improve customer stickiness. According to the opinions, we will accelerate the tracking research and development of digital currency, increase technical support and technical reserves, actively build the use scenario of digital currency, accelerate the digital transformation, and do a good job in digital currency risk management.

2.2. Changes of Payment Platform

The rapid development of the network has also promoted the innovation and reform of network technology and internet economy. With the increasing popularity of personalized mobile tools such as mobile phones in the group, the business field of intelligent payment has also become a hot spot in the field of “technology + finance”. Wu Qifeng also put forward the transformation process of intelligent payment from the first stage--the birth of bank electronic payment to the second stage--the rise of the third-party mobile payment, such as Alipay and WeChat payment; then to the third stage--the vigorous development of biometric payment, such as fingerprint, face brushing and face-to-face payment. [2] With the development of new technology, the payment platform reflects the innovative characteristics of contemporary design. Therefore, the research on payment carrier is a major reform of “technology + product”.

3. Product Concept and Application Scenario

3.1. Product Concept

In order to actively respond to national policies, it is necessary to focus on improving the knowledge dissemination efficiency of digital currency and expanding the application channels of its technology, optimize the operation mode for the social electronic payment platform, improve the quality of citizens' convenient life, and further create a new generation of intelligent interactive products for “new technology application” based on the integrated design of “digital currency payment system + interactive products”.

The interactive products of digital currency payment system can not only improve the transaction efficiency for users, but also save the time of social activities for users to the greatest extent. The application, namely, the main connotation of strengthening the construction of digital society and digital Chinese government, the main means to help the country form an innovative development pattern, and an important channel for actively participating in world management, greatly simplifies the transparency and convenience of transactions and meets the universality of products; broadens the communication channels of digital currency, improves the communication efficiency and influence of the practicability of digital currency, improves the practical value and marketing value, and effectively reflects its application value to meet the social and public needs in the public sphere. In addition, the application expands the inclusive degree of digital currency, puts forward scientific and reasonable statistical data for

the work of government departments and provides a basis for government departments' decision-making.

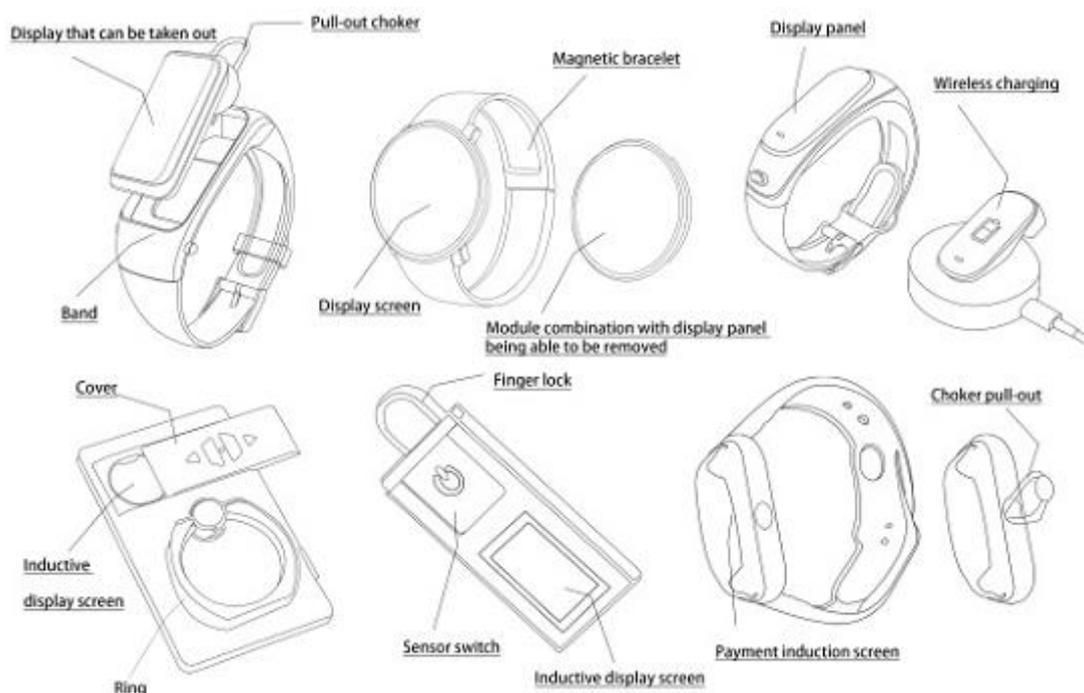
3.2. Application Scenario

The interactive products under the digital currency payment system are an important hub for sharing new technology carriers. In the new media era, the combination of product design and digital technology improves the dimension and breadth of product application scenarios, and can quickly and efficiently detect the use needs of people. Moreover, the reformation of the new mode of payment carrier attracts more target users to accept digital currency, so as to further expand the data collection and analysis of the application of digital currency payment carrier. Therefore, in the future, with the continuous expansion of users' awareness of the new payment carrier, the positive role played by interactive products under the digital currency payment system can also be continuously reflected. The increasingly accurate data can make a positive response to the security problems of the current payment environment, which does not only provide scientific statistical data for the government, but also provides reference for government decision-making as well as innovation and reference in the field of product design, and makes a positive contribution to creating digital application design products in the new era.

4. Product Interaction Design Idea of Digital Currency Payment System

4.1. Design Scheme Process

Through the preliminary analysis, the sketch scheme is drawn according to the analysis results, and the most suitable scheme is found for creative analysis from modeling, appearance, function, process, material and crowd, as shown in Figure 1 and Figure 2:



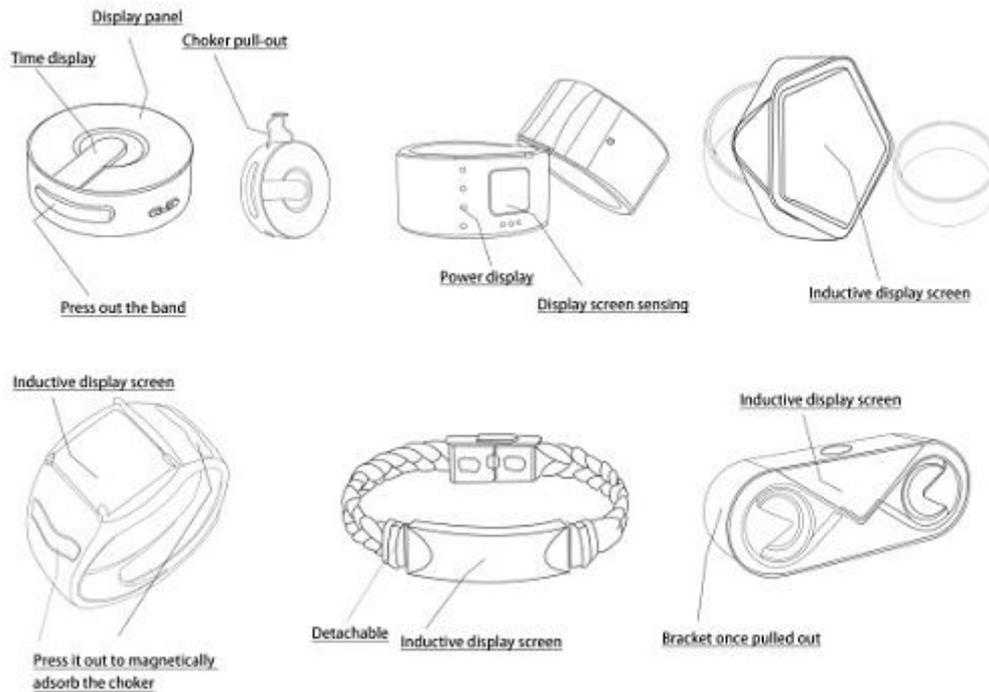


Figure 1. Sketch Scheme.

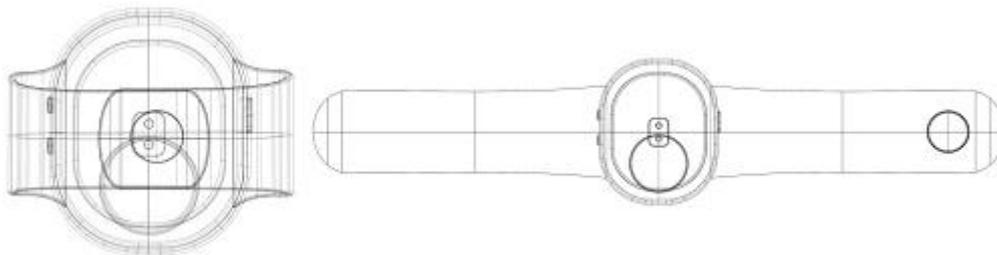


Figure 2. Final Scheme Outline.

4.2. Hardware Design

The core system of hardware includes trusted hardware, wireless module, voice module, G-sensor module.

(1) Trusted hardware stipulates that offline payment needs to be signed through TEE and checked for whether there are payment vulnerabilities in the carrier supporting trusted execution environment. In this case, the security of dual offline payment is actually guaranteed by the manufacturer supporting TEE chip. Firstly, the technical difficulty and cost of destroying TEE are high. Secondly, the chip is in real name, that is, once the security of TEE chip is violated, it can be held accountable, and the equipment can be included in the blacklist to ensure its payment security.

(2) The wireless module is provided with an ultra-low wireless application technology with power consumption to facilitate the design of devices close to the size limit. Combined with Bluetooth BALUN, the discrete device BAL-01D3 can be used to ensure the signal performance and reduce the board size. With these characteristics, the signal within the range and the recovery terminal are covered in the same network, and various digital data can be collected for terminal monitoring and tracing.

(3) In terms of voice module, due to its multiple functions, good timbre, wide application range and stable performance, the serial port control module can also

adjust voice playback, pause, cycle and adjust volume, while LED display module is a module to realize data interaction between bracelet and users.

(4) G-sensor is mainly a gravity sensor which can feel the change of acceleration force, including various movement changes such as swing, fall, rise and fall and be converted into electrical signals by G-sensor, and then use the operation and analysis of microprocessor to provide traffic application information under digital currency.

4.3. Software System

The software system includes server, device, client and WEB software system design.

(1) In terms of service end, the main DC/EP of the Central Bank is adopted. The full name of DC/EP is “digital currency electronic payment” which exists to replace M0. Highly legal DC/EP is a legal currency that cannot be rejected by other organizations, businesses and even individuals. DCEP is a dual offline payment, that is, if both parties are offline, even in underground shopping malls without signals, both parties can realize the function of digital currency at any time. DCEP’s decentralized account book management mode can realize bookkeeping before deduction, which provides system support for the dual offline payment mode. An ideal virtual trade environment can be established by using DCEP legal currency system to eliminate the circulation of banknotes and coins, so as to save the cost of printing, returning and storing banknotes. At the same time, digital currency can realize the real-time collection of data such as creation, bookkeeping and flow, as well as the tracking of currency, which greatly enhances the security, anti-theft, privacy protection, positioning and tracking of currency. (Figure 3)

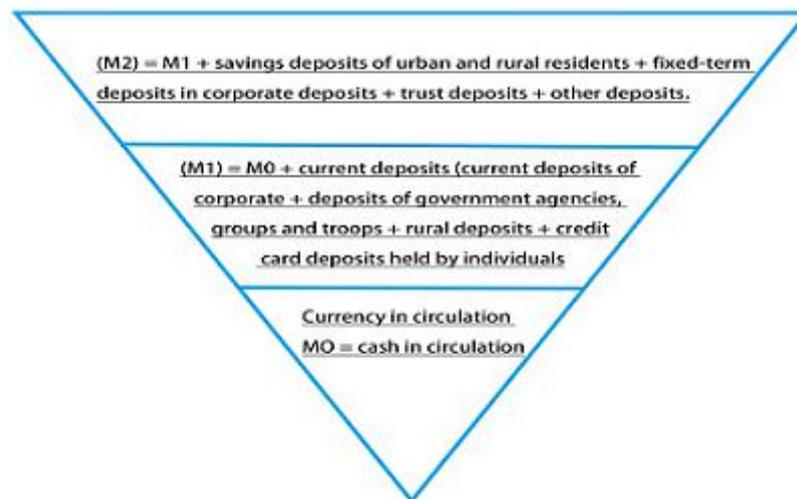


Figure 3. Construction of Legal Tender System.

(2) In terms of the device side, under TEE technology, it is difficult to destroy and the cost is high. Secondly, personal chips are bound by real names, which can be the source of accountability, thus providing a system guarantee for the security of dual offline payment.

(3) In terms of the client side, after user authentication, NFC’s technical functions can be used, that is, the offline contact transactions can be achieved by touching.

(4) The Web side used by equipment terminal management and maintenance personnel can obtain the alarm display of the terminal and monitor. The maintenance personnel can carry out safety maintenance and equipment maintenance according to

the alarm message. In addition, the terminal on the Web side can process, find out and track down the responsibility.

4.4. Product Design Analysis

(1) Material: taking rubber and leather as the main materials of the band, its soft material has good comfort, wear resistance, anti-corrosion and moisture-proof, good visual effect and high cost performance, which can make people feel comfortable and safe when wearing the product, and control the cost.

(2) Color: the color is mainly dominated by neutral and dark color, and then various color systems are created according to different ages.

(3) Modeling: in the design modeling, the screen is designed into a rounded square box with popular band. The whole product is small and convenient for consumers to wear freely.

(4) Function: the function is mainly the currency payment function. Under the digital currency payment system, the daily consumption payment and transportation payment are made by touching, as well as the visual collection and sorting of consumption data. At the same time, there are auxiliary functions, such as arrival vibration reminder, intelligent anti-theft and positioning, which are easily operated and can be applied to all kinds of roads, communities, parks and other outdoor venues as well as indoor venues.



Figure 4. Product Design Analysis Diagram.

4.5. Operation Display of Payment APP Page

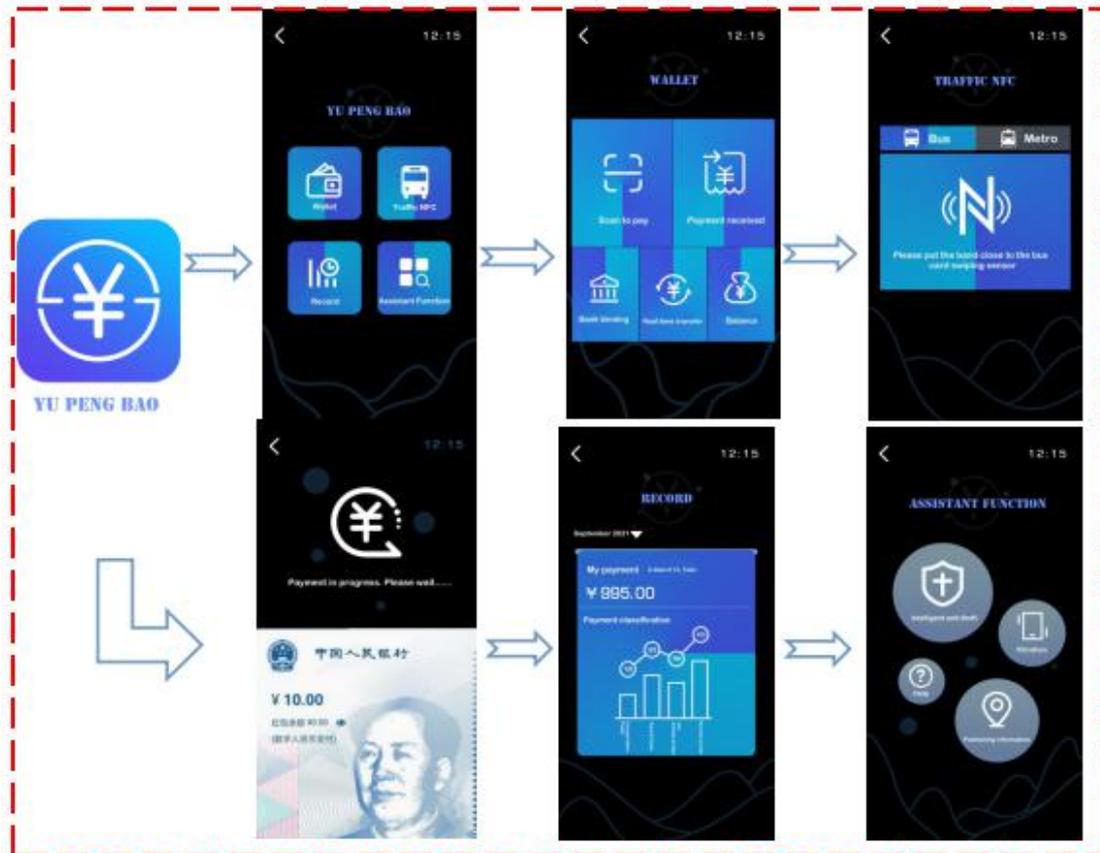


Figure 5. APP Operation Interface Display.

5. Conclusions

The “14th five-year Plan” Outline proposes to steadily promote the research and development of digital currency. In the new era of digital economy and society, the development and pilot of digital RMB is not only a major content for China to promote digital industrialization and information industry digitization and strengthen the construction of digital community and digital government, but also a major means to help China’s economy form a new development pattern, and an important channel for China’s participation in world governance. Taking this hot information as an opportunity, being based on product innovation design and taking technology integration as a mean, it is necessary to pay attention to hot social topics and provide feasible reference schemes. In addition, the Project is of great significance to solve social problems and seek people’s livelihood in combination with today’s needs. Therefore, this product has played a great advantage. First, the product has the guaranteed advantages, that is, special knowledge and skill training are provided for service staff to make them have sufficient knowledge and skills and good service attitude, so as to improve customers’ credibility and sense of security of service quality. Second, the product has the security advantages. Under the direct control of the bank, the product has a perfect protection system and response measures, which can enhance the credibility of users to a great extent. Third, the product has the perfection advantage, that is, the product is ready to provide convenient and reasonable consulting services to customers at any time, including correcting mistakes and reducing trouble to them, so that all kinds of customer needs can be effectively

solved, and customer rights and interests will always be put in the first place. Fourth, the product has the popularization advantages. Relying on national policy and technical support, the product has the advantage of universal use for Chinese people. Fifth, the product has multiple interactive advantages. The product has a variety of interaction modes for users to choose, so as to meet users' personalized needs. Sixth, the product has the innovative advantages. With constantly innovated new forms of products and service methods, the product brings customers the latest product experience and the latest service design.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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