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An Implement of Real-Time Cryptocurrency Price Monitoring System

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Abstract: Recently, interest in cryptocurrency such as Bitcoin, etherium, Bitcoin cash, monero andlitecoin based on the blockchain technology has been rapidly increasing andinvestment and transaction of cryptocurrency have been activated. However, since, cryptocurrency is very different from stocks which are financial assets, it is necessary to confirm frequent amounts of money. Therefore, cryptocurrency investors have to constantly check the cryptocurrency market using a computer or a smart phone. Therefore, in this study, it is expected that the time of using the cryptocurrency market can be greatly reduced by implementing and introducing the monitoring that displays the data on the fluctuation in real time.

Key words: Cryptocurrency, market, monitoring, real-time, Bitcoin, computer, smartphone, stock

INTRODUCTION

Since, 2009, various kinds of cryptocurrency have been developed starting with bit coin. In the early days, people were not interested in cryptocurrency, so, the size of the cryptocurrency market was very small and transactions so small. However, as the interest in the fourth industrial revolution era becomes more and more increasing, the cryptocurrency which is expected as a payment means can be used for person-to-person transactions, object-to-person transactions, transactions between objects and objects, Considering it will be the core of the Internet of Things, its value has greatly increased (Rue, 2017; Shin and Kim, 2016).

As the value of cryptocurrency has increased, the demand for cryptocurrency has increased, resulting in many cryptocurrency market and now many people are trading or investing in cryptocurrency market. The way to check pricing and information on a cryptocurrency market is very similar to stocks by accessing web-based pages such as market web pages via computers or smartphones. However, it is the same that the cryptocurrency is composed of supply and demand like stocks but the actual cipher money transaction is very different from the stock transaction. Unlike a stock market, a cryptocurrency market does not have any holidays, there is no break time, it is a 24 h trading day andthe price fluctuation of a cryptocurrency is so large that naturally a cryptocurrency trader checks prices and information very frequently (Lee *et al*., 2016; Jun and Yeo, 2014). Table 1 shows the differences between the stock market and the cryptocurrency market.

Table 1: The difference between stocks and cryptocurrency

Difference	Stock exchange	Cryptocurrency exchange
Opening hours	7-8 h	24 h
Holiday	O	X
Price change rate	Low change rate	High change rate

There are three main differences between the stock market and the cryptocurrency market. Opening hours are different. And while the stock market has holidays, the cryptocurrency market has no holidays. Finally, the stock market has a low price change rate while the cryptocurrency market has a very high price change rate.

Therefore, the more frequent the price change of the cryptocurrency, the more frequent the checking of the price and the time is increased. In order to solve this problem, the information of the cryptocurrency is expressed indirectly through various methods that can be expressed in everyday life without using the computer and the smartphone. In this study, after receiving the cryptocurrency price data of the cryptocurrency market and transmitting it to the system after processing with necessary information, the system shows a kind of platform that expresses the received data in various ways (Ju *et al*., 2015) (Fig. 1).

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Fig. 1: Graph showing bit coin price in 2017 (From January 1, 2017 to December 18, 2017). This graph can be inferred that transactions for virtual currency will increase as bit coin prices rise significantly in 2017 (it can be seen that the beat coin price increased by 1289.66% for about 1 year)

MATERIALS AND METHODS

Configuration and method

Utilization of API: The most important thing in this system is receiving price information of cryptocurrency in real time. Methods for receiving price information include RSS service, web parsing and API. In this study, we use API provided by cryptocurrency market to obtain cryptocurrency price information. The reason for this is that the web parsing technique method is unstable because the system does not receive the information whenever the cryptocurrency market web is modified. And RSS service is not suitable because it is not suitable to receive data in real time. However, API can receive data in real time and it is convenient and stable to process with price information of desired coin.

System configuration: Figure 2 shows the configuration of a cryptocurrency monitoring (Cryptocurrency API and PC were used). First information is provided using the API provided by the cryptocurrency market. Secondly, the computer processes the received information into necessary information and sends it to the embedded system that will serve as a platform. Third, the embedded system, acting as a platform, receives the cryptocurrency price information and calculates the price or percentage of the cryptocurrency currency (Ju *et al*., 2015). Finally, the platform expresses the data to the user in a natural way, not a computer or a smartphone. And in this study, we propose a cryptocurrency platform to express data to the user by using RGB-LED as one of many methods (An *et al*., 2017; Seo *et al*., 2017).

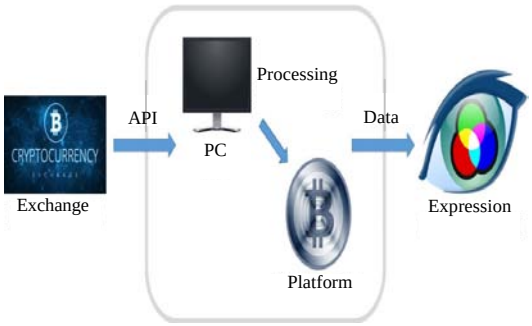

Fig. 2: Cryptocurrency monitoring method

RESULTS AND DISCUSSION

The cryptocurrency monitoring platform test proceeded as follows. The personal computer receives the information of the cryptocurrency in real time using the exchange API and parses only necessary information. The user selects a desired cryptocurrency type and a reference amount and presses a button. The price of the selected cryptocurrency and the base amount are then transferred to the embedded system acting as a platform.

Figure 3 shows that a program that receives various information by using an API sends the information of the user's desired cryptocurrency to the embedded system wirelessly using TCP/IP.

Embedded system which acts as a platform, receives information from the PC and calculates the difference between the base amount and the current amount. Now, on the platform, data must be presented to the user. In this test, the data is represented using RGB light that is easy to use similar to the home IoT platform (Jo and Kim, 2011; Kim, 2016).

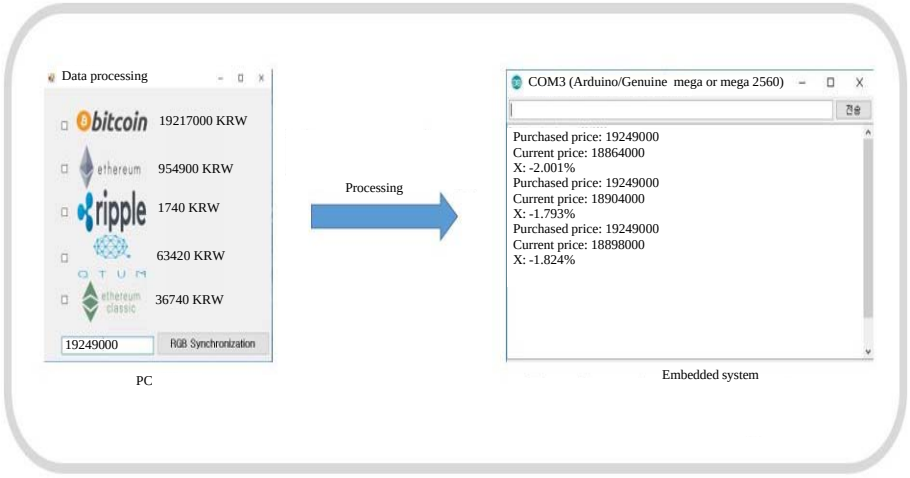

Fig. 3: Cryptocurrency monitoring program

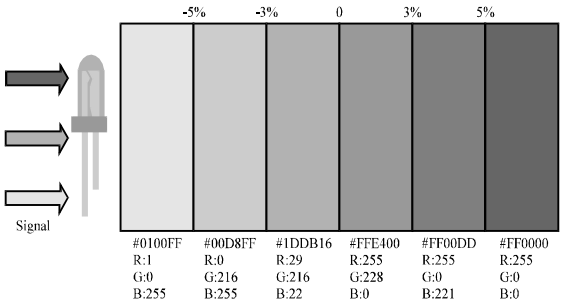

Fig. 4: Cryptocurrency data expression using RGB-LED monitoring program. It is possible to check the cryptocurrency information according to the color represented by RGB-LED

Fig. 5: Representation example using computer RGB-LED. RGB signal value according to the fluctuation of the cryptocurrency price on the system (blue, sky blue, green, yellow, magenta, red)

The reason for this is that the system of this study has a wide variety of ways to utilize the data like the IoT platform.

Figure 4 shows the RGB signal value according to the fluctuation of the cryptocurrency price on the platform. Up to 3% of the standard amount represents # FFE400 yellow color, 3-5% represents # FF00DD magenta color and 5% or more represents # FF000 red color. And from the standard amount, -3% represents # 1DDB16 green color, -3 to -5% represents # 00D8FF sky blue color and -5% represents # 0100FF blue color.

Each color is determined by three RGB signals. Therefore in the embedded system, three signals are transmitted to the LED to express the cryptocurrency price change. LEDs can represent various colors based on the received RGB signals. In this study, the deviation of the RGB signal is set to a large value, so that, the discrimination of each color is easy for the actual test. As a result, colors are designed for the purpose of expressing colors such as blue, blue sky, green, yellow, magenta andred colors.

Computer parts were used for actual testing between the studies. RGB-LEDs were configured using one AMD RYZEN CPU cooler, two DDR4 RAMs, six 120 mm system coolers, four 300 mm system strips anda splitter to distribute RGB signals. And all of these are commonly used components in computer assembly and will be applicable to most new computers as well (Fig. 5).

In this study, we can confirm that the RGB signal is changed according to the change of the cryptocurrency price through the test of the real time cryptocurrency monitoring system. Cryptocurrency when the price goes up, it represents yellow, magenta andred andwhen the price of cryptocurrency falls, it represents green, sky blue andblue. And the corresponding RGB color is not fixed andeach RGB data signal can be changed to represent different RGB colors.

CONCLUSION

In this study as the characteristics of cryptocurrency market and various problems have arisen, cryptocurrency traders have invested a lot of time to check cryptocurrency data. In order to solve the above problem, the cryptocurrency data which can be confirmed by using the existing computer or smartphone was expressed by the RGB-LED using the platform based on the embedded system. Cryptocurrency Get data using the API provided by market. Then, only necessary information is parsed and transferred to the embedded system. Therefore, if this system is used when the cryptocurrency trader is doing other work or resting, if his assets are identified only by the RGB color of the computer, it will be very simple and very useful. Of course, this system can represent cryptocurrency data not only with computer but also with all things using RGB-LED. For example, there are light fixtures and Christmas trees. And if, we apply other expression methods as well as RGB-LED as a platform, we expect to be a better and more efficient system. This system can be expected to be a better and more efficient system if we apply other expression methods as well as RGB-LED as a platform.

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