THE DESIGN AND IMPLEMENTATION OF A LOW-COST BITCOIN VENDING MACHINE

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Bitcoin (BTC) is a virtual and anonymous cryptocurrency that removes the middleman, such as a bank or central government, from a two-party transaction. A currency such as Bitcoin is important when third parties cannot be trusted. Any bank may be hacked at any time, which leaves our personal information and finances compromised. Instead of a middleman, Bitcoin uses secure mathematical proofs to ensure that transactions are valid. The process of verifying the proofs, or mining, forces BTC transactions to take much longer than those of cash or credit card - 10 minutes on average. This is why BTC is rarely used in time-constrained transactions. For quick vending machine transactions, Ethereum (ETH)'s "smart contract" functionality is utilized, where a virtual contract describes an agreement where the customer will send the vendor an amount of BTC in exchange for an item in the vending machine. A low-cost vending machine is designed and implemented using an inexpensive, WiFi-enabled microcontroller and economical components: a serial monitor, servo motors, and buttons. The microcontroller connects to a server set to perform the BTC/ETH transaction, search for transaction ID on the ETH network, and verify that the number of confirmations exceeds or is equal to 12. If so, the transaction is valid, and the machine vends the requested item. A low-cost vending machine demonstrates that BTC can be implemented in a time-constrained environment, opening doors for normalized BTC usage and functionality in small transactions.