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Drug Cipher: Record, Track and Validate Pharmaceutical Products

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1 Abstract

Just as the blockchain has been successfully utilized in the Finance industry to abstract the problems of facilitating payments; We propose **Drug Cipher** a modern, easy, and sophisticated means of tackling the biggest issues challenging the medical/pharmaceutical industry which is the problem of authenticating the validity of pharmaceutical products. Drug Cipher introduces an effective means of battling this worldwide problem, by utilizing the power of securely generated and Serialized QR codes whose contents are encrypted and permanently store on the blockchain. Credits to the immutability of decentralized blockchain infrastructures, validity of these products can be tracked from the manufacturing stage till they get to the intended patients.

2 Introduction

Globalization, trade feasibility, and rising demands for intellectual property are all facilitators of economic growth; however, they've also created opportunities for criminal networks to expand the scope and scales of their operations, utilizing cheap labor and well-defined trade routes to distribute counterfeit pharmaceutical products. This in turn has led to massive economic decline; Trade in counterfeit goods has not only damaged economic growth but also undermined good governance, the rule of law, and citizens' trust in government, which has ultimately threatened political stability. In addition, in some cases, such as that of fake pharmaceuticals, counterfeit goods can have serious health and safety implications for citizens. Although several approaches have been employed to tackle this issue, all efforts have seemed futile or yielded minimal results.

What is required is an electronic log system that is based on cryptographic proof rather than trust or mutable persistence systems. Our Proposed solution is a decentralized system that generates a unique computational proof of chronological order of pharmaceutical products. Products whose metadata are technically impossible to tamper with, and that can be tracked from their prospective source of production, up till their point of dissemination and validation.

3 Data, Scope and Distribution cycle of counterfeit pharmaceuticals products

4 Why Drug Cipher

Drug Cipher introduces a safer and reliable means of eradicating the problems of drug counterfeiting in an ever growing world of the pharmaceutical Industry; although prior solutions to validating pharmaceutical products where focus is placed on validating the content of pharmaceutical products alone; Drug Cipher extends this solutions to enhance mainstream adoption, enabling users to have total control over products they consume; and to do this drug cipher is built from ground up to be intuitive and seamless for both end users (consumers) and the manufacturers alike. In order to abstract the complexities of a technically demanding solution like this, Drug cipher divides it technologies in two sections i.e The core implementation and a platform. For the platform, drug cipher utilizes web and mobile devices to deliver a simple and user friendly platform for users and manufacturers respectively [add link that talks about platform]. The core implementation of drug cipher is fundamentally based on two technologies, which we discuss in details below.

4.1 Secured QR Codes

Secured Qr Codes (SQRC) are advanced Qr codes technologies that are generally made of two kind of information, the public information and the private information. The public data can be read by any reader such as a smart phone much like a normal QR code. Whilst the private data is encoded with a password that can unlock the information, where a proprietary scanner is required to scan the password and reveal the encrypted data. These encrypted lookup code can point an authorised reader to a location from where they can pick up the information of a particular product. Drug Cipher utilizes Qr Codes to distinguish the identity of each product, by embedding images that are undetectable to the human eyes or regular cameras, when these products are being validated, the Qr scanner sorts for the hidden images before processing them through a series of algorithms producing a result based on the validity of the scanned image's quality.

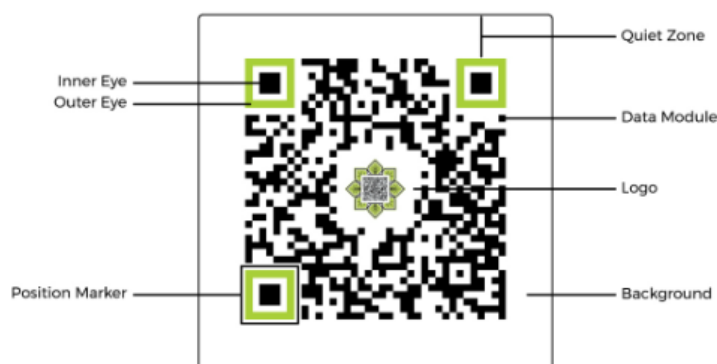


Figure 1: Graphical illustration of the components of a secure QR code.

4.1.1 Error Correction Levels

Encoded in the QR code is one of four QR code error correction levels. The higher the correction level, the more damage a QR code can sustain while remaining scannable. It's like a stored backup of the QR code. The lower the correction level, the more space left for size and data.

4.2 Blockchain

Drug Cipher encrypts and stores all products information on the blockchain, to enable ultimate assurance against data interference or manipulation from external entities. Building upon the NEAR Protocol; a layer one blockchain platform, drug Cipher is able to achieve top tier performance, committing thousands of drug informations in seconds. With the blockchain, products information such

as the ‘date created’, ‘expiry date’, ‘name’, ‘serial id’ and ‘manufacturer’s information’ cannot be mutated once committed to the blockchain, thus implying the uniqueness of Drug Cipher with respect to similar platforms, since with blockchain persistence no singular entity have control over the state of the data store on the chain.

4.3 Artificial Intelligence

For

5 Summary

6 Call To Action (CTA)