Cubecert: A Decentralized Product Authentication Solution

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Executive Summary

Counterfeit, imitation, and pirated products pose significant risks to consumer safety and economic stability. At the same time, consumers are increasingly interested in the origin of a product's manufacture or assembly. Manufacturers have tried to combat this problem in many ways but have been unsuccessful in solving it. Cubecert offers a patented, blockchain-based authentication system designed to mitigate these risks by providing immutable accounting of product authenticity, provenance, chain of custody, and ownership. This solution provides the ability for manufacturers to solve the problem and help them protect their brand. This whitepaper explores the functionality and benefits of Cubecert's solution, emphasizing its seamless integration into existing business processes and the enhanced protection it provides to manufacturers and consumers alike.

Introduction

Counterfeit and pirated products endanger consumer health and safety while depriving governments, businesses, and communities of vital revenues and legitimate employment opportunities. The rise of global trade and e-commerce has further complicated the ability to track and verify product authenticity. Traditional methods of authentication are often inadequate, as they can be easily tampered with or duplicated.

By utilizing a patented digital certificate methodology and tamper-proof QR codes, Cubecert ensures that each product's authenticity is verifiable, protecting manufacturers' brands and consumers' trust. This system can be seamlessly integrated into various products and services with minimal disruption to existing business processes.

Problem Statement

Counterfeit and pirated products put the health and safety of consumers worldwide at risk while robbing governments, businesses, and communities of tax revenues, profits, and legitimate jobs. The negative impacts of counterfeiting and piracy were, in 2017, projected to put up to 5.4 million legitimate jobs at risk, and reach a total yearly value of counterfeited goods of up to 2.81 trillion, by 2022[1][2]. The US Chamber of Commerce, in 2022, reported that counterfeit products cost the global economy over $500 billion every year[3]. Based on data for 2019, OECD-EUIPO estimated in 2021 that the volume of international trade in counterfeit and pirated products amounted to as much as USD 464 billion in that year, or 2.5% of world trade[4].

Identifying authentic products prevents counterfeit items from reaching customers, protecting manufacturers, rights holders, content owners, vendors, and sellers.

Counterfeiting and piracy create a multitude of problems, including:

- **Health and Safety Risks**: Counterfeit medical supplies and other critical products can be harmful, as they often do not meet safety standards.
- **Economic Impact**: The global economy loses trillions of dollars due to counterfeit goods, affecting businesses and employment.
- **Brand Damage**: Counterfeit products undermine consumer trust in brands and lead to revenue loss.
- **Complex Supply Chains**: Lack of transparency in supply chains makes it difficult to track product origins, authenticity, and custodian tracking.

To combat these issues, a reliable system is needed that provides transparent, immutable records of product journeys, ensuring that consumers receive genuine products.

Cubecert Functionality

Cubecert is a cloud-based Software as a service (SaaS) application that enables the manufacturer to create digital certificates unique to each product. With the manufacturer module, the user can create product records, including attributes such as serial number, description, media such as images, and other identifying attributes. The software generates unique digital certificates and corresponding QR codes for each product and records those to the blockchain. We know that each product is different, so the QR codes can be easily customized to seamlessly integrate with the look and feel. Each product record can be grouped into lots which will later be used for transport. The lots are also tracked via QR code and any authorized custodian scans are recorded to the blockchain. We can also generate the same unique certificates to be added to RFID or other media.

Consumers can scan the unique QR codes for each product and can perform inquiries or claim ownership of the product. The inquiry scan will provide the manufacturer provided details, source of where the product was made, as well as any custodian/transport scans that have occurred after the product leaves the manufacturing facility. With the authentication scan, the consumer will claim ownership of the product which will be associated with their account. Users can view their inventory of products that have been verified as authentic through this software solution.

In addition to the above, robust reporting allows manufacturers to see where their products are in the logistical supply chain and confirmed sales with actual customers.

Cubecert System Components

Public Facing Website

- **Information Hub**: Provides essential information such as privacy policy, terms of use, and company details including a contact form.

Backend Server

- **Data Management**: Manages backend processes, integrates with the blockchain, and handles data/media storage and retrieval.
- **Communication**: Manages data and communication between the front-end and the blockchain.
- **Redundancy**: Facilitates enhanced redundancy of data by mirroring blockchain information in a centralized database along with additional, less critical metadata to provide an improved end-user experience.

Mobile and Web Application

- **Multi-Platform Support**: Available on Android, iOS, and Web.
- **Secure Platform**: Implements state-of-the-art guidelines for authentication protocols and secure account management.
- **Consumer Functionality**: Allows consumers to authenticate and manage their purchased products using QR codes and their Cubecert account.
- **Custodian Functionality**: Allows custodians to create "transport waypoint" scans using QR codes.
- **Manufacturer Functionality**: Supplies manufacturers with a comprehensive Management System for staging products, grouping them into transport "lots," committing these "lots" to the blockchain, generating QR codes for printing, managing corrective adjustments when needed, and robust reporting.

Blockchain Smart Contracts

- **Low Cost Blockchain**: Utilizes the Polygon blockchain for cost efficiency.
- **Cubecert Controller Contract:** Deploys and Controls child "Lot" contracts.
- **Cubecert Lot Contracts:** Holds transport lot and product information as well as recording authenticity scans and ownership.

Solution and Benefits

Cubecert offers a comprehensive solution to product authentication challenges by providing a decentralized platform that ensures data integrity and transparency. The use of blockchain technology provides a "trustless" and immutable record of certification associating consumers with their purchases, and the integration with QR code technology, along with encryption methods, eliminates the risk of tampering and provides a reliable means for verifying product authenticity. Manufacturers can track their products through the supply chain, consumers can authenticate their purchases, and custodians can log transport details accurately. All of these aspects are readily available by the manufacturer from a reporting perspective and will help gain insight into product logistics.

Key Benefits

- **Unbreakable Authentication**: Eliminates the risk of tampering or manipulation by leveraging QR Codes, modern encryption techniques, and enterprise-level security.
- **Transparent Traceability**: Provides complete visibility into the supply chain, tracking products from manufacturer to consumer on-chain where the entire world can easily and independently verify processes.
- **Enhanced Brand Protection**: Protects against counterfeit products, safeguarding brand reputation and customer trust.
- **User-Friendly Interface**: Enables easy product authentication and ownership transfer via QR code scans.
- **Scalable and Adaptable**: Can be integrated into various industries, including clothing, automotive, art, medical supplies, and more.
- **Direct Consumer Insights**: Manufacturers gain visibility into when products are sold, enabling direct connections with consumers.

Product Category Examples

Clothing & Apparel

Cubecert enables consumers to verify the origin and authenticity of high-end apparel independently, ensuring that they are purchasing genuine items. Items such as shoes or designer purses can be easily associated with a unique identifier that can be trusted by consumers.

Automotive

Consumers can verify the authenticity of custom automotive accessories, preventing the infiltration of counterfeit parts.

Art

Unique works of art can be tagged with digital certificates, providing proof of authenticity and ownership.

Medical & Health

Cubecert ensures that medical supplies are genuine and meet regulatory standards, protecting consumer health and safety. Foreign country fakes not only impact your bottom line, but put your consumers at risk and your brand reputation.

Electronics

Items such as counterfeited cellphones have been flooding the market and impact millions of unsuspecting consumers.

Watches

There is popularity for prestigious watches, but many are being sold as replicas.

Conclusion

Cubecert offers a robust solution to the pervasive problem of counterfeit products. By utilizing blockchain technology, Cubecert provides manufacturers with a reliable method to verify product authenticity, protect their brands, and maintain consumer trust. This system not only secures the supply chain but also enhances transparency and accountability, fostering a safer and more trustworthy marketplace. Ultimately, the software will enable your consumers to gain confidence and trust in your brand.

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