



Unique Authentication Methods for Supply Chains



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In our fast-paced world, the advances in technology offer many new solutions, especially in the field of product verification and authentication. Tracking, tracing, and product authentication are critical measures to ensure quality control, theft protection, and traceability in supply chains.

In recent years, the advancement in technology has led to the development of several product authentication methods. Each of the methods is unique in its own right and this article will cover a few of these methods.

With the evolution of AI technology and its subfields, we now have the potential to address this problem with new technology.

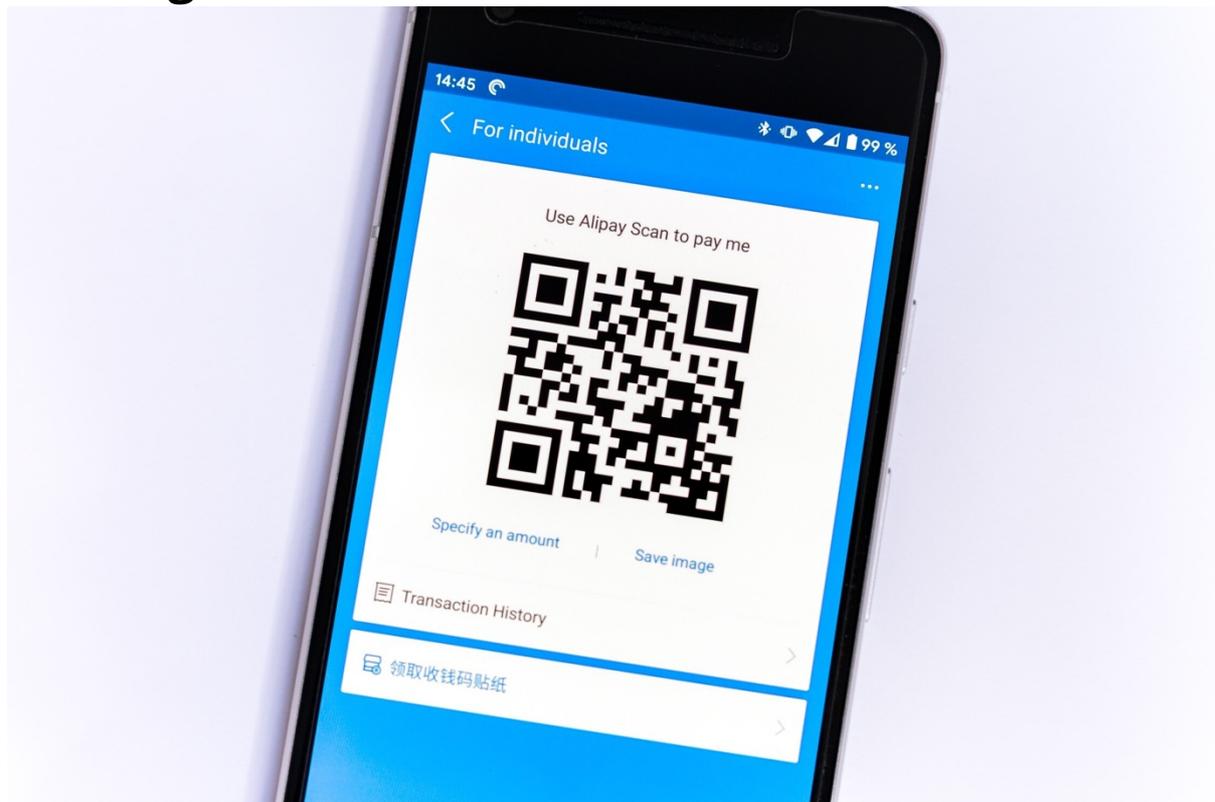


What is Authentication?

Authentication is a process that validates the identity of the product and the person that requests access to a system, process, administrative task, or device. Today, there are various user authentication methods to prevent unauthorized personnel from accessing sensitive information and product authentication methods.

Similarly, product authentication will verify that the appropriate process is followed during the source's transit process to the end-user. Authentication can also identify and prevent adulterated or counterfeited products that don't meet the quality standards from getting added to a particular shipment or product batch.

Existing Authentication Methods



Overt Method

The Overt authentication method relates to printed 2D codes in serial numbers, QR codes or data matrix codes, and other machine-readable representations for product codes. While the overt method is still in use, its popularity is due to ease of use and familiarity with the technology. The downside of this method is that product counterfeiters can easily replicate these codes. As there is no reliable approach to differentiate the original QR codes from the duplicated ones; therefore, QR codes aren't entirely quality as the product authentication method.



Hologram-Based Authentication

Although hologram-based authentication is minimal, it exists as a security feature for the product, such as credit cards or banknotes. Holograms have complex features that are hard to duplicate, but it has primarily remained a cosmetic function for security rather than verification. The early days of hologram creation were confined to specific manufacturers, but it is possible to order customized holograms with varied characteristics and cannot detect a counterfeited one in the technological era.

RFID

RFID tags are commonly used for easy tracking and contactless identification of objects using RFID devices. The use of RFID is prevalent in the logistic industry, one of the supply chain's critical factors. The low-cost RFID tags are prone to tampering or being copied. Hence, they are not suitable for authentication. On the contrary, RFID tags that come at a higher cost are considered to be clone-proof. The barrier to using RFID tags as the primary source of product authentication is the cost factor and concern with tag switching or cloning.

Why is Product Authentication Important?

Product Counterfeiting is a serious global issue that is increasing rapidly, especially in recent years. Counterfeiting is attracting theft, crime, and some adulteration within the supply chain. A complex supply chain structure and a massive distribution channel make it challenging to monitor and track the products.

Product authentication solutions ensure that individuals that are engaged with the supply chain can easily authenticate the products. Counterfeiting is prevailing across industries such as e-commerce, pharmaceuticals, machinery, electronics that don't have any durability or quality assurance.

Similarly, the agriculture sector suffers from theft or the addition of low-quality food products that don't meet the standards and erode rapidly. Additionally, product tags of food products are counterfeited, and non-organic food products are sold at higher prices. Therefore, the market has an ever-rising need for product authentication methods to tackle the challenges.

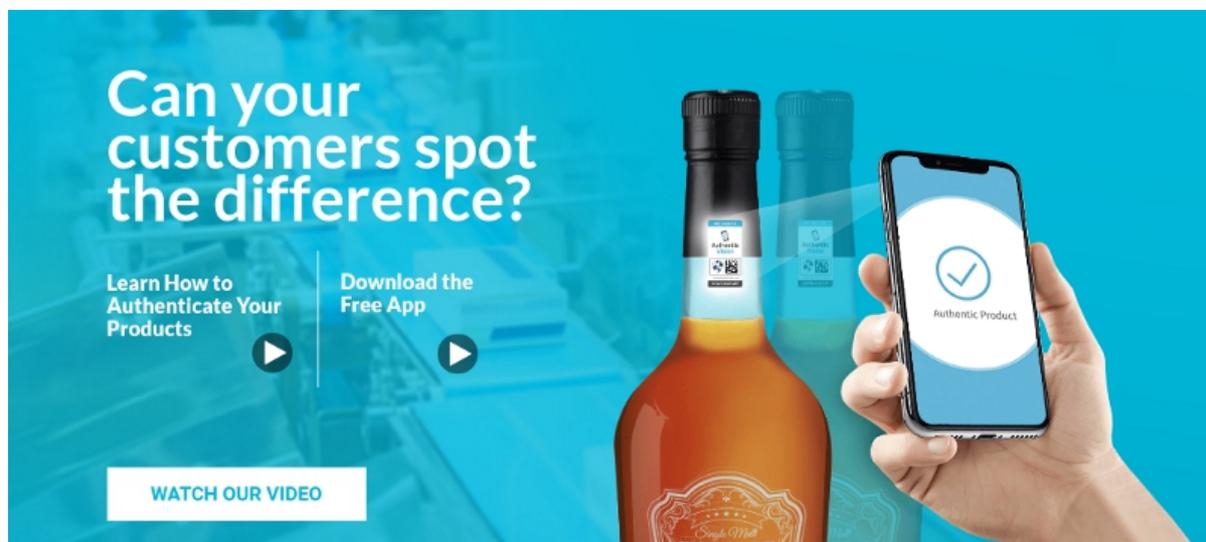
Currently, product authentication solutions are in the form of QR codes or serial numbers and the use of holograms. However, such solutions don't provide a robust authentication solution, and they fail to secure the supply chain and maintain integrity. Some existing solutions fail due to simple to use factors but not secured, while others are secured options but have expert and dedicated hardware requirements, and some are not cost-effective solutions. Also, all the existing solutions are requiring manual supervision of some kind which makes it less efficient.

Artificial intelligence has been the preferred choice of technology in recent years for building an automated and more well-refined authentication method that can provide end-to-end protection within the distribution network from the manufacturer to the consumer.

Recent Innovations for Product Authentication

Two notable examples include:

Authentic Vision



This company offered a security tag solution that is a secure, user-friendly, and cost-effective process for product authentication.

The clients can select the type of security tag and determine the simplicity of the tag, including the factors of special equipment or training needed for the tag system for product authentication. The security tag consists of machine-readable code, a unique human-readable code, and a random 3D structure that is copy proof, and even the company cannot reproduce the code once its generated. The security tag is also compatible with mobile devices and has real-time tracking and geolocate of the whereabouts of each product.

Product Fingerprint

Product Fingerprint by Deeplai offers a unique solution and a novel approach for product authentication. This approach is an AI-enabled visual traceability and authentication method that can create a unique product fingerprint using various visual product cues.

Product authentication solution

for Consumer & Brand Protection

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The products with the *visual fingerprint* let manufacturers and distributors track their products throughout the supply chain. For example, apple production takes place on a large scale. Therefore, a manual examination of such a massive quantity for labeling and quality check is nearly impossible.

Deeplai's AI-powered multidimensional image analysis considers the color and shape and can also perform a damage assessment of the product from the image fed into the system. The system generates a unique product fingerprint which is assigned to each product. The details are stored in the cloud platform for secure and tamper-proof record keeping.

Conclusion

Authentication technology is quickly evolving and there are many new options available in the market. A secured supply chain network is achievable with the integration of product authentication methods that can reduce counterfeiting, theft, and other security-related factors to avoid any misuse of the product.

Artificial intelligence technology offers a new approach to automated product authentication methods that have been much awaited in the industry.