

Connected Products: why authentication is a hygiene factor



Understanding
the business benefits
of authentication
and the hidden risks
of neglecting it

April, 2023





About this paper

Brands are increasingly adopting digital product IDs, equipped with product passports and connected product services, to improve transparency and optimise processes through better traceability, protect their brand and enhance sustainability by reducing counterfeits, or increase consumer engagement and loyalty through connected services. However, **if not implemented properly, these digital IDs can have the opposite effect of their intended purpose, increasing a brand's vulnerability to counterfeiters and malicious actors, damaging its reputation, and lowering sustainability and consumer satisfaction.**

It is not uncommon for Brands to underestimate the importance of adequately protecting their digital IDs. Authentication may not be considered a necessary feature of their connected product strategy. Conversely, brands may inadvertently adopt insecure solutions in the false belief that they were intrinsically secure. In both instances, project leaders often go unaware of the serious risks that they are creating both for their projects and the rest of their organisation.

Secure product authentication is essential to mitigate the risk of damaged brand

reputation, exposure to legal issues and supply chain ungovernability. It is also an opportunity that can be leveraged to boost business strategies. More than a defensive tool, it can be deployed as a proactive strategy for business growth. This makes product authentication a must-have hygiene factor of a brand's digital id and connected product strategy.

This white paper will introduce the business benefits of authentication, unveil the hidden vulnerabilities of Digital IDs, and help brands avoid the risks they represent, by creating an understanding of the key pillars of a secure deployment.

This paper **serves as a primer for both brands considering connected products and those that have already adopted Digital IDs**, and is intended to provide essential insights to ensure the safety and success of their connected product strategies. It has been authored by Certilogo, who can call on more than 16 years of experience in providing secure Digital IDs and connected product experiences, and manages a new product authentication every 4 seconds (and growing) for top fashion and luxury brands.

Contents

4 Executive Summary

6 Introduction

The growth of Digital ID and Connected Product adoption

9 The increasing value of authenticity

How authentication boosts consumer perception and sales

The changing face of what makes a product genuine

Successful implementations of product authentication

18 Avoid the unseen risks of insecure Digital IDs

Not all Digital IDs can provide reliable authentication

Dispelling the myths: the illusion of security

The rise of the super-fake

The pitfalls of insecure digital product IDs

31 The anatomy of secure authentication

Security check-list

The Secure by Design™ approach to authentication

36 About Us

Executive Summary

Companies are rapidly adopting smart tagging solutions for their products to meet growing consumer demand for product transparency and prepare for upcoming regulations that will make digital IDs mandatory in Europe within the next 5 years.

By implementing secure and certifiable IDs, brands can offer trusted traceability throughout the supply chain, monitor the grey market, and reduce the need for labour-intensive returns handling. In addition to protection against counterfeits, product authentication allows for enhanced engagement and circularity strategies.

Brands that fail to implement authentication as part of their connected product strategies, and those that mistakenly overestimate the security of their authentication implementations are exposing themselves to significant hidden risks.

Not all Digital IDs can provide reliable and secure authentication. Counterfeiters can easily clone insecure product IDs, applying them to many thousands of products, while fake markers can redirect users to a brand's website or a simulated authentication experience, further convincing consumers that a fake product is genuine. It is therefore essential to be able to recognise clones from the originals.

It is crucial to design authentication systems that can identify and manage

cloned and fake IDs to prevent illicit items from inevitably entering and contaminating the circular brand ecosystem, just as they do today with the new market.

Risks are compounded when project teams are falsely led to believe that certain authentication technologies provide an impenetrable level of security. While blockchain's distributed ledger technology can provide secure and transparent record-keeping of the product's online identity, it is not infallible in authenticating physical products. Cloned unsecured physical IDs can be checked against their record on the blockchain, which can lead to a false sense of authenticity. Therefore, it is essential to complement blockchain with other forms of ID security on the physical product.

Digital tagging technologies by their nature can be cloned, including most NFCs, just as they too can be secured by being complemented by a multi-layered approach that combines other technologies applied in the label in combination with broader fraud detection systems. Each marker has its own distinct specific features and benefits which must be weighed against the needs of both the brand and the end consumer. Even the QR code can be secured and in many cases be more effective at detecting fakes, as well as being more durable, less expensive, and more sustainable to produce than other types of digital markers.

Even the most secure unclonable NFCs equipped with OTP don't fully solve the problem. While providing a walled garden around a brand's ecosystem of services that allows access only to authentic products, the approach the approach does not allow to monitor and control the inevitable market of fake products. On the contrary, it can make it worse, eventually causing reputational issues to the brand, because it does not manage the highly delicate consumer use cases when they inevitably and unwillingly encounter illicit products.

Connected products are changing the nature of what defines a product as being genuine. In today's connected context, authenticity is no longer defined solely by a product being certified 'not fake', but also by a brand's ability to tell a truthful story about its product and demonstrate it in action. Authenticity is conveyed by the marker and the digital journey that the consumer experiences. The digital ID has become an icon of authenticity, and products without one, even if genuine, may not be considered authentic.

Consumers tend to place implicit trust in technology, which can make them less attentive to physical cues of a product's genuineness. Digital IDs are

enabling counterfeit products to become increasingly convincing and causing consumers to become more vulnerable to being deceived. Insecure Digital IDs are giving rise to the super-fake, and can ultimately make the problem they set out to tackle get worse.

Digital IDs are prone to cloning, exactly like physical products, resulting in two or more products that share the same ID. When brands are unable to tell these products apart, brands are at increased risk of counterfeiting, the theft of product identity and information, erosion of consumer trust, non-compliance with upcoming regulations, and supply chain ungovernability.

The key to secure product authentication does not rely on a single marker type or ID-issuing technology. Rather, it involves a complex system of multiple and interconnected factors. By making security a key pillar of their digital ID strategies, and ensuring they are supported by a dedicated experienced partner, smart brands will avoid the pitfalls of insecure authentication and obtain increased returns on their investment by leveraging authentication throughout the circular lifecycle of their products.

Introduction

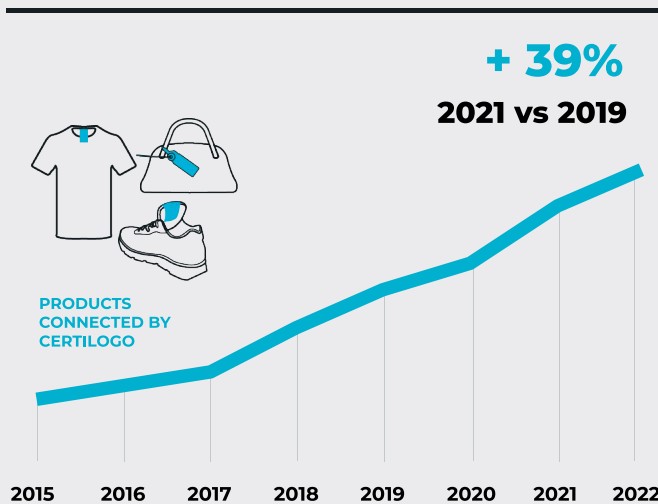
The growth of Digital ID and Connected Product adoption

Fashion, luxury, sports, and casualwear companies are rapidly adopting smart tagging solutions for their products. Leading brands, including Armani, Versace, Nike, Decathlon, Diesel, and Zara, have already implemented this technology. Many are deploying solutions across their entire product portfolios, driven by consumer demand for product transparency, the growing resale market that requires aftersale connectivity to scale, and upcoming regulations that will make digital IDs mandatory in Europe within the next 5 years.

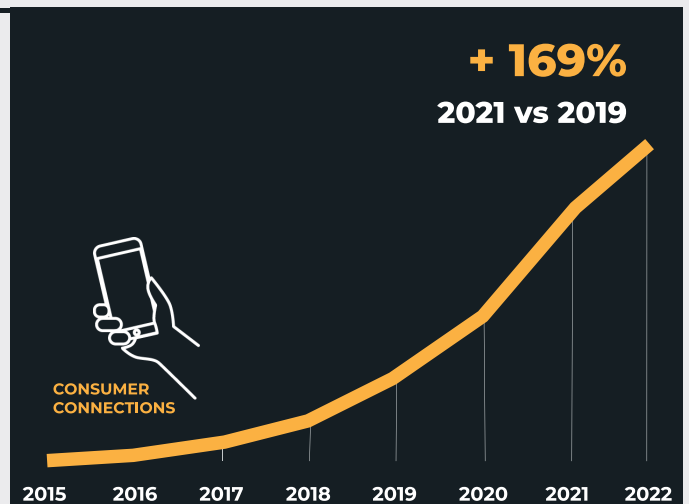
According to a 2020 study¹ conducted by SDA Bocconi in collaboration with Certilogo and BeSight, 36% of companies have already explored tagging solutions to connect their products and exchange information with their customers. The smart connected clothing market is expected to grow by €2.7B at a CAGR of 14.84% from 2021 to 2026.

Certilogo has witnessed an increase in the number of products connected of 39% between 2019 to 2021, while engagement with connected products over the same period has increased 169%².

The rise of the connected product



Source: Certilogo Analytics
Number of products with Certilogo smart-tags, cumulative data.



Source: Certilogo Analytics
Connections to products with a Certilogo smart-tag, cumulative data.

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¹ Source: eBook by Certilogo, 2021: 'Assessing the digital resilience of the Italian fashion and luxury industry', featuring Survey conducted by Bocconi University, in partnership with BeSight.

² Source: Certilogo Analytics 2022. Number of products with Certilogo smart-tags, cumulative data and connections to products with a Certilogo smart-tag, cumulative data.

What is a connected product?

Connected products are physical objects that are linked to the internet, allowing them to communicate information about themselves, their environment, and their users. They have a unique digital identifier that can be read by machines through digital markers such as NFC tags or QR codes. This allows the product to be identified, authenticated and traced while providing access to its digital ID for information and services.

By connecting analog products to the internet, they become smart digital assets that can be integrated throughout the entire omnichannel consumer journey and circular product lifecycle. Connected products represent the final piece of fashion and luxury's digital transformation puzzle. The digitisation of the product itself.

The features of a connected product

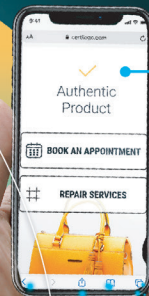
1
A digital enabler
that consumers
can interact with



2
Data, services and
content associated
to the product



3
A user journey
activating
data, services
& content



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So what is driving the accelerated adoption of connected products?

Expanding applications

Connected products have come a long way since their initial use in preventing counterfeit products. Today, **brands leverage also digital IDs to trace products, optimise supply chains, improve sustainability, and enhance customer engagement.** By combining various connected product strategies, brands are increasing their return on investment in digital IDs. As a result, the greater the number of brands that are recognising the relevance and benefits of connected products to their business needs, the more rapidly the ecosystem of connected products expands.

Consumer expectations

Connected products meet the rising expectations of modern consumers by providing instant access to information and services when they need it the most. With the advancements in smartphone technology and the widespread use of QR codes, **consumers are more likely to connect to their products.** Authenticity is highly valued by consumers who are mindful of the risk of counterfeit products, especially when purchasing online. By offering authentication, consumers feel more secure in protecting their economic investment in luxury items and ensuring sustainability, performance, health, and safety. A new generation of consumers expects brands to be transparent about a product's origins and value the support they provide in reselling the product.

Digital Innovation

New technologies such as Blockchain, NFTs and the Metaverse are driving experimentation with online experiences

and even the sale of intangible digital fashion products. Adidas' recent partnership with Bored Ape Yacht Club, a collection of illustrated monkeys sold as NFTs, gave owners access to both physical and digital experiences. Similarly, Forever 21 has created a game that enables players to open a Forever 21 store in the metaverse. In the gaming world, Fortnite, with an almost €6B average annual revenue is effectively one of the world's largest fashion retailers, with all of the products sold being digital. Connected products represent an exciting opportunity for brands to use their products as **an exclusive access key to the growing field of digital fashion, enabling value to flow between the digital and physical worlds.**

Regulatory pressure

Leading fashion brands are proactively adopting connected products as they anticipate future regulations that will mandate their use. The **EU's circular textile strategy** places ***the Digital Product Passport (DPP)*** at the centre of its initiatives. The DPP is a digital certificate that provides comprehensive information about a product, including its supply chain and lifecycle, from raw materials to disposal. The fashion industry is identified as one of the next product categories that will require Digital Product Passports, with **guidelines expected in 2023 and legislation shortly after.** Other regulations such as the **INFORM Consumers Act** and **The SHOP Safe Act** in the USA will hold brands liable for protecting consumers and the environment by limiting the sales of counterfeit and stolen products in online marketplaces. As a result, **authentication will become a standard feature** and essential to meet these measures.

The increasing value of authenticity





How authentication boosts consumer perception and sales

One of the most popular features of connected products is product authentication. It is a powerful tool that enhances sales conversion rates, boosts desirability, and increases product value.

The Brand Asset Valuator (BAV) framework, widely adopted throughout the brand marketing industry, identifies four key pillars that determine the value of a brand. These pillars include **differentiation, relevance, knowledge, and esteem**. Differentiation refers to how unique and distinct a brand is compared to its competitors, while relevance measures the extent to which a brand is meaningful and useful to its target audience. Knowledge represents how well-known and familiar a brand is to consumers, and esteem evaluates the level of respect and admiration a brand has among consumers and its industry peers.

Trust is a critical component of building esteem for a brand and determining its overall value. **When consumers trust a**

brand, they are more likely to admire and respect it, which can lead to higher esteem and greater brand value. Trust also plays a role in the relevance pillar of the BAV framework, as consumers are more likely to find a brand meaningful and useful if they trust it.

Establishing trust is of increasing importance in today's marketplace. Consumers are becoming more conscious of the risks associated with buying counterfeit products, particularly when shopping online or purchasing pre-owned items. **Trust is crucial for ensuring that consumers feel confident purchasing a fashion product,** knowing it will meet their expectations in terms of quality, design, functionality, and ethical production practices. Brands that are transparent, authentic and committed to delivering on their promises will be the most successful at building trust. Failure to establish trust can harm a brand's reputation and bottom line.

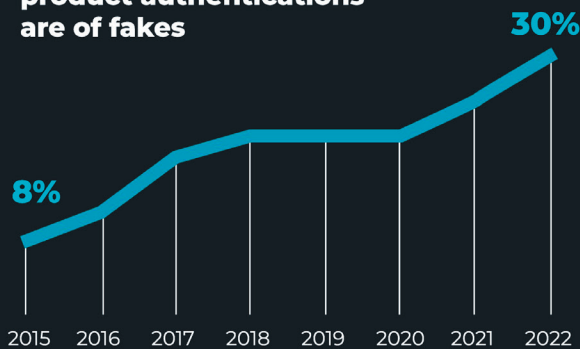


The pandemic of counterfeit products

The growth of eCommerce has exacerbated the problem of counterfeits.

3 in 10

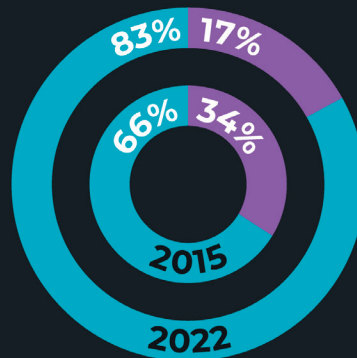
product authentications are of fakes



Percentage of authentications identified as 'fake'

8 in 10

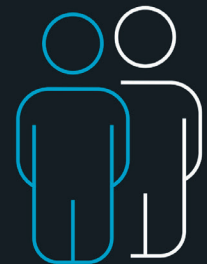
of fakes are sold online



■ Online ■ Store

1 in 2

believed they were buying the genuine product



Source: Certilogo Data. A. Percentage of 'fake responses' delivered in respect to the total from 2015 al 31/8/2022.

B. Distribution of 'fake responses delivered per distribution channel during the same period. C. Certilogo data, 2022. Based on the percentage of survey respondents who, after the authentication of a counterfeit product, answered "No" to the question "Did you expect this product to be fake?".

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Authentication boosts sales

Authentication is a critical component in building trust with consumers, as it helps to establish the authenticity of a brand's products and associated information. Products that offer **authentication reduce sales friction** by providing added confidence in the buying process. Authenticity is relevant for more than just high-value purchases; it also plays a crucial role in ensuring safety, performance, and ethical standards, all of which are significant factors influencing consumer behavior.

Authentication drives engagement

Authentication is a powerful driver of product engagement, with 70% of consumers citing it as the reason for connecting with their purchase³. By **leveraging authentication to drive engagement**, brands can more effectively connect and activate consumers, regardless of their specific goals. Whether the aim is to generate leads or drive traffic to a website, starting the conversation with authentication is the most effective strategy.

³ Source: Certilogo Analytics, 2022. Percentage of survey respondents who selected "Verify authenticity" as the reason to connect to their product.



70% of consumers cite authentication as the reason why they connected with their purchase⁴

Authentication increases value

Easily authenticatable products are more attractive to consumers as they can be more easily sold and **retain their value better when resold**, allowing consumers to recoup a greater portion of their initial

investment. At the time of purchase, consumers are already considering their options for when they are finished with the product, with 35.6% of them planning to resell it⁵.

⁴ Source: Certilogo Analytics, 2022. Percentage of survey respondents who selected "Verify authenticity" as the reason to connect to their product..

⁵ Source: Certilogo data, 2022. Based on the percentage of survey respondents who, after the authentication of a counterfeit product, answered "Resell it" to the question "What do you intend to do with this product when it is no longer of use to you?".

Easy to authenticate products retain greater value when sold second-hand



Product **with** authentication service



Product **without** authentication service



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Decoding authenticity

The changing face of what makes a product genuine

Connected products are changing the way consumers perceive product authenticity. When encountered outside of a brand's own trusted retail experience, the consumer's ability to discern a real product from a fake relies on their own experience and expertise.

Connected products however, can convey authenticity through their unique, secure digital markers by enabling consumers to instantly **authenticate the product and its history**, without any specialist knowledge. Digital IDs enable products to share their origins and manufacturing processes, and to be integrated into an ecosystem of brand services, such as repair, resale, and recycling,

thereby enhancing the product's value and circularity.

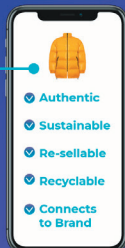
Authenticity is no longer determined solely by a product being certified 'not fake', but also by **the digital journey of the consumer experience and the brand's ability to tell a trustworthy story** and demonstrate it in action. Authenticity means being true to one's word and walking the talk. Hence, the digital ID has become an icon of authenticity, and where the consumer expects a brand's products to be connected, the absence of a digital consumer journey identifies the product as a replica.

• Product

• Identifier

• Content, services & Product Passport

• Data



Connected Genuine product

Replica product

With **no expected connected journey**, it is immediately identifiable as a **replica** or a product from a **previous collection**



Successful implementations of product authentication

Secure digital IDs on products provide businesses with the ability to authenticate products with confidence. This capability offers significant benefits to businesses that extend beyond building consumer trust. Authentication can be used to improve operations, products, and services. Here are some examples of how businesses are utilising authentication.

Check list

- Consumer protection and anti-counterfeiting
- Trusted traceability
- Over-production prevention and grey market monitoring
- Consumer engagement
- Sustainability and circularity strategies
- Returns management and manual processing
- Verify consumer feedback
- Gateway premium content and experiences

Consumer protection and anti-counterfeiting

Providing consumers with the reassurance that their purchase is genuine is one thing, but with the right digital ID and product authentication implementation, brands can also **take control of the problem of fake products**. Certilogo's digital IDs, for example, enable brands to intercept faked and cloned product identities, protecting the brand and consumer from counterfeiters and recovering lost sales.

As fake products are intercepted, consumers are directed to sales channels where they can buy genuine products, and data collected in the process helps identify and take action against illegal sales channels. In 2021 alone, **Certilogo safeguarded consumers from purchasing €36m of fakes⁶** and enabled brands to recover sales that would have otherwise been lost to counterfeiters.

⁶ Source: Certilogo data. Estimated recoverable revenues for fashion companies based on the total value of counterfeits detected by Certilogo in 2021 and the share of survey respondents who, after the authentication of a counterfeit product, were willing to purchase the actual genuine product.



Trusted traceability

Product traceability is a crucial tool for businesses seeking to enhance quality control, supply chain visibility, regulatory compliance, and product recall effectiveness. Through the use of secure and certifiable IDs, brands **ensure the integrity of traced data**, providing transparent assurance that the product has been tracked properly throughout the supply chain. This fosters trust throughout the entire value chain, making the brand more appealing to consumers, suppliers, clients, and retailers.

Connected products offer brands visibility to identify issues and optimise inefficiencies, while also aiding compliance with regulations and avoiding potential fines or legal liabilities. By utilising authentication as a consumer engagement hook, the product's **traceability is extended well beyond the point of purchase**, throughout the product's use and its circular regeneration.

Consumer engagement

Product authentication provides an opportunity for brands to enhance consumer engagement and generate valuable data for marketing and customer relationship management. It is the most important hook for creating consumer engagement with connected products. For any brand's consumer engagement strategy, incorporating product **authentication as an option is vital for achieving high conversion rates**.

Consumers place great value on the feature's usefulness and context of trust, making them increasingly willing to engage with the brand. Leading brands leverage product authentication to generate leads, with **marketing opt-in rates as high as 39%**⁷. Others enrich CRM profiling, deliver campaigns, drive traffic to brand and social-media channels, or solicit feedback through surveys.

4"

Consumers engage every 4" with products we've digitised

+180

Countries from which consumers connect to our digital IDs

+500M

Products already empowered by our secure digital IDs

+80

Brands that unlocked the power of their products with us

94%

Consumer satisfaction with our service

10

Localisation in 10 languages and customer care out-of-the-box

Source: Certilogo Data 2022. Copyright © 2020 - 2099 Certilogo - all rights reserved

⁷ Source: Certilogo data, 2022. Percentage of consumers that give marketing opt-in consent at the moment of authentication.



Sustainability and circularity strategies

Consumers are increasingly demanding that brands take responsibility for their social and environmental impact, and are willing to pay more for sustainable and ethical products. Brands that can offer concrete actions to help them establish a responsible relationship with fashion are highly sought after, with 93% of consumers finding connected products with green services useful⁸.

To meet this demand, brands can use secure IDs to provide trusted, transparent, and traceable information

about their products. Certified digital product passports enable circular design and services and facilitate sustainable business models based on rental, repair, resale, and recycling. Built-in anti-counterfeiting technology also helps mitigate the negative impact of fake products. In fact, **71% of consumers consider the ability to authenticate a product as the most useful sustainability feature of connected products⁹.**

By adopting these measures, brands can not only reduce their environmental impact but also grow their business and increase consumer trust.



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^{8/9} Source: Certilogo survey conducted 14/07/2022 - 31/08/2022 on 400 consumers that had verified an authentic product.



Grey market monitoring

Consumer-enabled product **authentication provides brands with valuable data.** By analysing the data generated from each consumer engagement, brands can understand where and how their products are being sold, and identify patterns and trends that can inform their marketing and distribution strategies. This feature is particularly useful for brands that want to **track their products across third-party sales channels**, identify overproduction, and monitor unauthorised “grey market” distribution of products outside of the brand’s intended distribution strategy.

Returns management and manual processing

Authentication can **alleviate the need for labour-intensive and expensive manual procedures**, such as customs inspections and returns handling. By verifying product authenticity, brands can **decrease their vulnerability to "friendly fraud,"** where dishonest consumers might buy a counterfeit item and return it instead of the authentic one they received to obtain a refund or chargeback.

Verify consumer feedback

Genuine ratings and reviews are crucial in driving consumer purchasing decisions and can boost sales by as much as 18%¹⁰. During the authentication process, reviews can be collected and tagged as trusted to differentiate them from malicious, **false, or damaging reviews based on bad experiences with counterfeit products.** This enables brands and consumers to filter and rely on authentic feedback from actual purchases.

Gateway premium content and experiences

Secure product authentication enables brands to link individual physical products to digital experiences and services, as well as dematerialised fashion purchases. By implementing verifiable digital product ID solutions, brands can create digital twins for each physical purchase that can be meta-ported and worn in the metaverse. This allows brands to sell NFTs and invite consumers to trade them for physical products, providing new opportunities for exclusivity and exchange of value across both digital and physical domains.



¹⁰ Source: Article: Ecommerce consumer reviews: why you need them and how to use them - www.econsultancy.com

Avoid the unseen risks of **insecure** **Digital IDs**






Not all Digital IDs can provide reliable authentication

Just because a product may have a Digital ID, does not mean it can be securely authenticated.

There is a widespread misconception that digital product IDs are inherently secure and can guarantee a product's authenticity. The assumption is that the ID is unique to the product and can be cross-checked and verified against

a database of authentic product IDs. However, merely recognising an authentic ID does not mean it can be accurately authenticated.

Controlling the issuance of IDs to ensure that only authorised products receive an official passport does not guarantee the prevention of counterfeit products circulating.

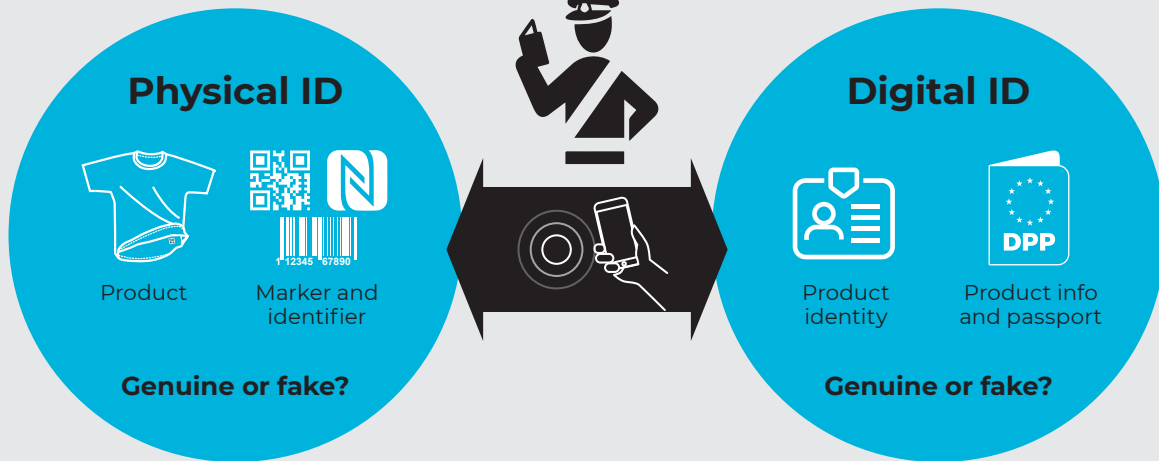


Even if the passport issuing system is totally secure this does not mean that false passports are not going to circulate.

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The role of passport control



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The combination of a secure issuing system and a passport control that is established to recognise illicit passports is what protects the system from unwanted intruders.

Randomising the production of product IDs can make it difficult for counterfeiters to guess and mass-produce a large series of product identities. However, **counterfeiters can easily clone product IDs**, so this is a common occurrence. Brands should expect a single duplicate product ID to be applied to many thousands of products without proper security measures in place. Without adequate security measures **all forms of digital markers, including RFID and NFC, are vulnerable to cloning.**

Counterfeiters also create markers and tags that resemble a brand's authentic versions and can lead consumers to believe that the product is genuine by linking them to the brand's website or a **simulated authentication experience, that completely circumvents the brand's IDs and authentication platform.**

As digital IDs have become popular for certifying authentication, counterfeiters have started applying them to fake products of brands that have not yet adopted them on genuine garments. This demonstrates the degree to which Digital IDs are considered synonymous with authenticity.

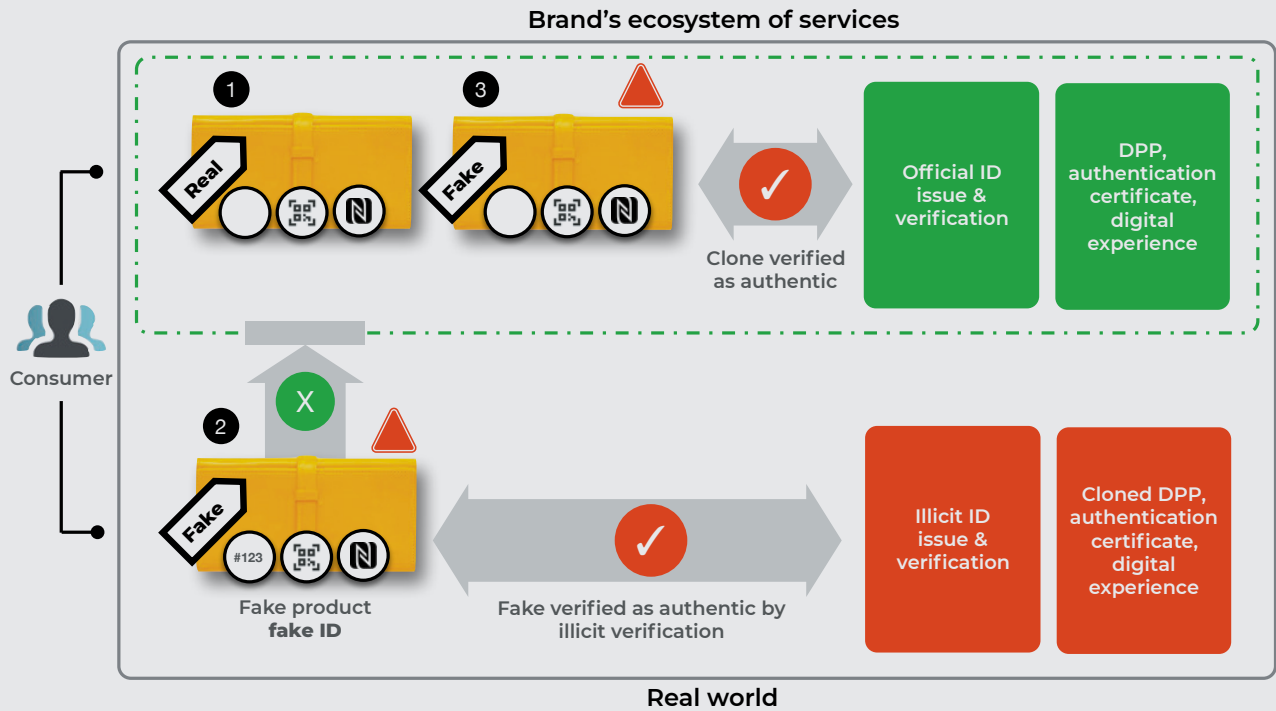
Let's take traditional travel passports as an example to highlight this issue. Even if the passport issuing system is totally secure and nobody can leverage it to issue a false passport, this does not mean that false passports are not going to circulate. You can expect criminals to produce false passports and try to use them, no matter how secure your issuing system is. The combination of a secure issuing system and passport control is what protects the system from unwanted intruders.



If passport control is not designed to detect cloned or false passports, the authorities will go unnoticed and remain unaware of their prevalence, and intruders will inevitably gain undetected access. The more sophisticated the production technology, the more sophisticated the counterfeiting techniques, and very often the risk of a false sense of security by the governing authority.

Similarly, **if a product authentication system cannot recognise and manage cloned or fake IDs, the IDs are insecure**, and illicit products will inevitably enter the system, resulting in contamination of the brand's ecosystem and circularity, just as they do today in the new product market.

Have you considered all use cases?



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1 Authentic products can be checked against the brands official ledger of identities and verified correctly as genuine.

2 Fake products that attempt to enter the brands ecosystem with an ID that is not in the official ledger will be recognised as illegitimate. However, counterfeiters will instead direct digital IDs to the brands homepage or to simulated authentication experiences which will convince the consumer that the fake product is authentic.

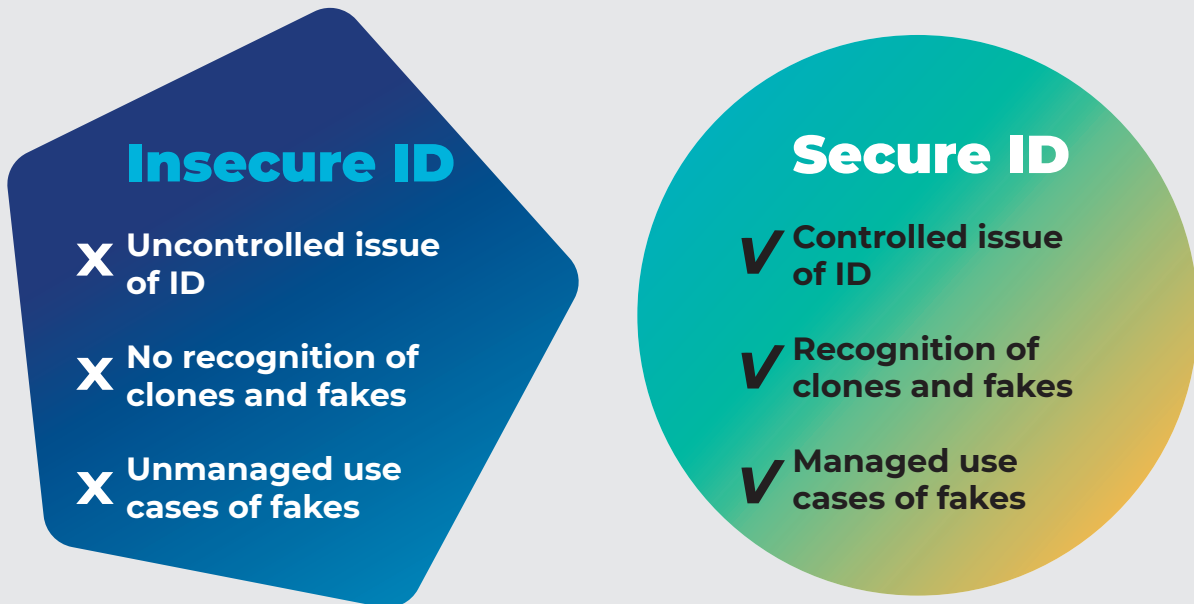
3 Products with cloned IDs will be incorrectly authenticated as genuine because the ID exists in the official ledger, even in the case where blockchain is used to issue the IDs.



Therefore, it is vital to design authentication systems that can identify cloned and fake IDs and manage the consumer experience when they encounter them, to prevent brand contamination and ensure customer trust. An insecure ID poses a considerable risk to your business. The most significant

risk arises when a brand assumes that its implementation is secure without conducting proper security assessments. Therefore, it is essential to verify the security of your digital ID implementation to mitigate potential risks.

The definition of secure digital product IDs



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Dispelling the myths: the illusion of security

How false confidence in blockchain can lead to catastrophe



Blockchain has gained great attention in the fashion industry over the past years for its potential to disrupt the fashion industry by increasing transparency, traceability, and sustainability. It has an important role to play in the theme of authenticity. However, **it is not an all-encompassing and unattackable technology that can guarantee the authenticity of a physical product.**

Blockchain is a distributed ledger technology that enables secure and transparent record-keeping across a network of computers. Its decentralised and distributed nature, cryptographic encryption, and consensus mechanisms, create a system that is commonly considered as 'un-hackable'. This makes it **an effective technology to securely issue product IDs** and product passports and ensure that their associated information is protected.

This high level of data security is often misinterpreted as being able to deliver infallible product authentication. Although blockchain can secure the data of a product's ID stored online, **the physical manifestation of the ID that is attached to the product itself remains vulnerable to being cloned.** Without adequate precautions, an insecure ID can be cloned, and the clone checked

against its record on the blockchain, which will be recognised and incorrectly be determined to be authentic. This makes it crucial to **complement blockchain with other forms of security to ensure robust authentication.**

Even deployments that combine NFCs equipped with OTP (One Time Password) don't fully solve the problem, and may actually make it worse. Effectively providing a walled garden around a brand's ecosystem of services that focuses security on restricting access to authentic products, it drops a 'Consumer-centric' approach for one that is 'brand-centric', and ignores the issue of fake products. It actually makes it far harder for brands to monitor and control the entire market which inevitably consists of fake products and will continue to remain out of their control.

By precluding illicit products that miss the password from being processed, brands miss an opportunity to capture valuable data during authentication. This data is essential to helping brands investigate the origins of illicit items and take action to prevent them. While providing a seamless experience for those consumers equipped with the right technology and know-how, the approach fails to address and manage highly delicate use cases when consumers inevitably and unwittingly encounter illicit products. With 50%¹¹ of consumers that buy

¹¹ Source: Certilogo data, 2022. Based on the percentage of survey respondents who, after the authentication of a counterfeit product, answered "No" to the question "Did you expect this product to be fake?".

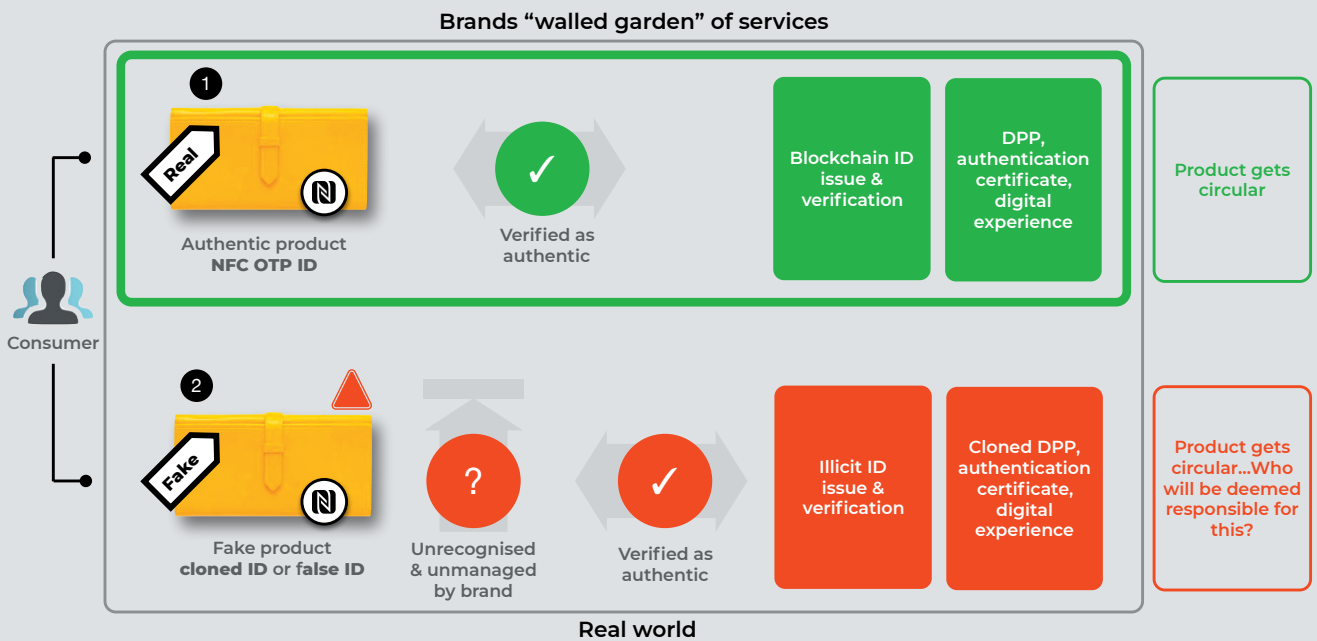


fakes doing so unintentionally and in the belief that they were buying the genuine product, failure to manage these use cases could represent a significant risk to brand reputation.

Blockchain can track the entire supply chain of a fashion product, enabling transparency and traceability, but it can only provide information up until the point at which the product is authenticated. Once a product is authenticated, it can still be tampered with or counterfeited in the future, so the blockchain record may not always be up to date.

Despite its perceived 'unhackable' nature, there have been several notable instances of blockchain being hacked. In 2014, Mt. Gox, one of the largest bitcoin exchanges at the time, lost over 850,000 bitcoins (worth over \$450 million at the time) due to a hack. While more recently in 2019, a hacker stole over \$40 million worth of bitcoin from Binance, one of the largest cryptocurrency exchanges in the world. While these hacks were not a result of vulnerabilities in the blockchain technology itself, but rather vulnerabilities in the applications built on top of it, these incidents highlight the need to secure the entire authentication system.

NFT OTP doesn't solve the problem



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1 With NFC OTP only authentic products are recognised and can enter the brands own walled garden of services.

2 However, all illicit products are unrecognised and prohibited from entering. They don't have the key to cross the threshold, and so the product and the consumer are left effectively outside of the walled experience. These sensitive consumer use-cases goes unmanaged which erodes consumer

trust. An opportunity to gather useful information to determine the origins of illicit products and take preventative measures is lost. Fake products authenticated by simulated authentication experiences continue to pollute the circular ecosystems of third partys outside of the brands walled garden.



| **QR-codes can be secure too**



The QR-code is often underestimated as a secure ID solution, but this is a misconception.

Misconceptions are so widespread and rooted in our thinking that we automatically consider QR codes insecure because they're easily copiable. Conversely, NFCs are often wrongly perceived to be intrinsically secure. Both, by their digital nature, are insecure in and of themselves, and are easily cloned by counterfeiters.

To prove that **security does not lie in the marker technology itself but rather in the methodology**, we have become leaders in secure authentication through all marker technologies, including NFC, numeric, digital fingerprinting and QR codes.

The secure deployment of QR codes, as with all markers, does not rely solely on the QR code itself, which is easy to duplicate, but rather on a multi-layered approach that includes other technologies applied in the label and broader fraud detection systems. Think of it as being similar to credit card security. The use of a simple combination of the card number and pin

makes it easy to use, but relying solely on those elements would be vulnerable to compromise, so it employs a multi-layered approach, incorporating **sophisticated algorithms** to safeguard cardholder financial information.

The use of QR codes when deployed securely should not be underestimated as they can offer a highly effective and cost-efficient way to provide robust digital authentication for products. Using secure QR codes as digital markers provides several advantages. First, they can be **more durable, less expensive, and more sustainable** to produce than other types of digital markers. Second, consumers are familiar with QR codes, and they are easy to access via any smartphone, which can lead to **higher engagement and better results**, such as increased interception rates of fake products or driving traffic to a brand's digital channels.

Each marker type has its own unique strengths and weaknesses and can be implemented securely when the underlying authentication platform is established to recognise and respond to clones.

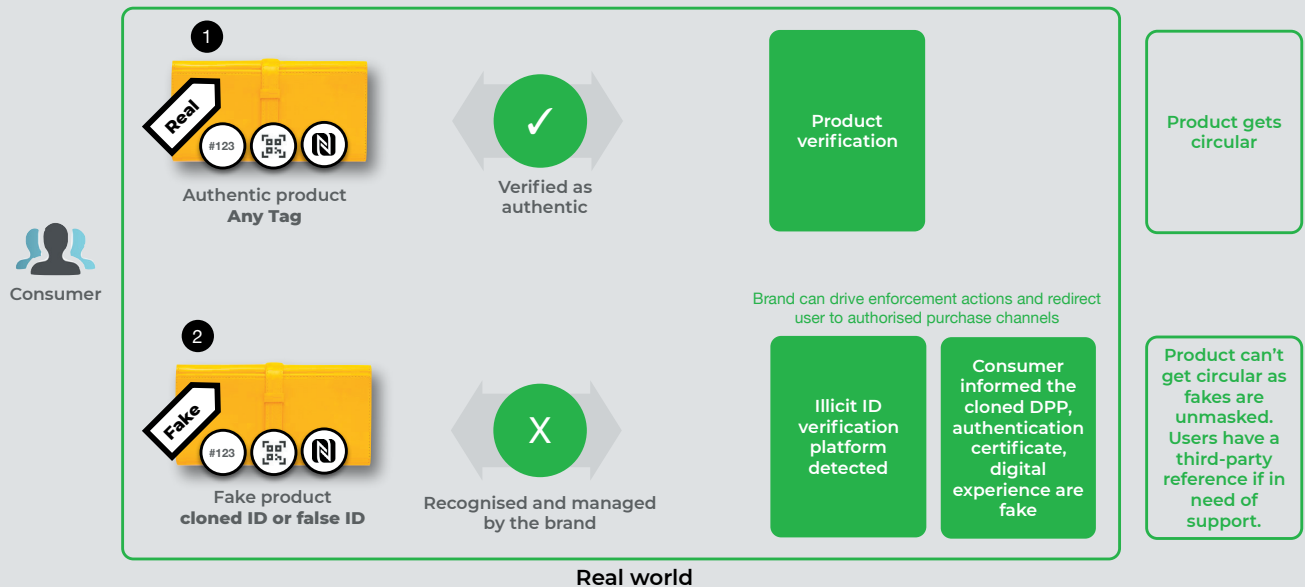


Counterfeiters possess the capability to circumvent new security measures, and attempts to render the marker physically impenetrable at the level of the tag, typically lead to increased costs and counterintuitively to less effective brand protection. Increased security at the

marker can lead to decreased usability on the part of the consumer, and an increased sophistication on their part to be able to distinguish a genuine marker from a fake. This reduces product engagement and lowers interception rates of fraudulent goods.

Certilogo's approach

Brands “walled garden” of services connected with real world
The brand is in control and committed to protecting a sustainable ecosystem



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1 Authentic products are verified as authentic and gain access the Digital Product Passport and the brands digital consumer journey.

2 Fake products with cloned and false IDs are intercepted, recognised and managed by the brand. Products can't circulate freely in the circular ecosystem that comprises both brands and third parties.



The rise of the super-fake

Could the solution to the problem of fakes make the problem worse?

The fraudster Frank Abagnale Jr., whose story inspired the movie "Catch Me If You Can" starring Leonardo DiCaprio, successfully cashed fake checks across America for years. His ability to do so was largely due to his disguise as a pilot, a highly respected profession at the time. The uniform created a sense of authenticity and trust that caused his victims to lower their guard and overlook any potential red flags.

As connected products become increasingly common, **digital markers have become a crucial indicator of authenticity.** Products lacking this marker may be perceived as fake, even if they are genuine. Conversely, counterfeit products may appear more authentic if they possess a marker, further complicating the issue.

Consumers tend to place implicit trust in technology, which can lead them to drop their guard when assessing a

product's authenticity. In the past, they may have been more cautious and relied on touch, appearance, or other physical characteristics to determine a product's genuineness. However, the presence of a digital marker, such as an NFC or QR code, can be a distraction and make them less attentive to these physical cues.

Consumers who take the time to connect to a digital marker to authenticate a product can still be misled. Cloned IDs of inadequately secured markers will falsely certify the authenticity of a counterfeit product. Fake markers redirect users to a brand's website or simulate authentication experiences, further convincing consumers that a fake product is genuine. **Digital IDs are enabling counterfeit products to become increasingly convincing,** and causing consumers to become more vulnerable to being deceived.



For brands, establishing secure and connected product journeys is crucial to avoid being held responsible for counterfeit experiences resulting from fake products. Neglecting the importance of such measures and **underestimating**

potential risks could not only harm a brand's trusted reputation but also subject them to accusations of promoting counterfeiting instead of combating it.

The image is split into two vertical panels. The left panel, on a blue background, shows a 'Connected Genuine product' (a yellow puffer jacket). It features a 'Product' label, an 'Identifier' (QR code, N logo, barcode), 'Content, services & Product Passport' (a smartphone screen with a checklist), and 'Data' (a document icon). The right panel, on a grey background, shows a 'Connected Replica product'. It features a red warning triangle icon with the text 'It says it is...', a smartphone screen displaying a checklist, and a 'Product' label. The checklist on the smartphone in the right panel includes: Authentic, Sustainable, Resellable, Recyclable, and Connects to Brand. The checklist on the smartphone in the left panel includes: Authentic, Sustainable, Re-sellable, Recyclable, and Connects to Brand.

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The pitfalls of insecure digital product IDs

Digital IDs are prone to cloning and this is to be expected. In order to be secure, authentication solutions must be able to distinguish clones from the originals. As soon as there are two or more products that share the same ID that can't be told apart, then the brand is exposed to a significant series of risks that include eroded consumer trust, damaged brand reputation, greater exposure to legal issues and supply chain ungovernability.

The risks of insecure IDs

- Exacerbate counterfeiting
- Product identity theft
- Erosion of consumer trust
- Reduced sustainability
- Reduced brand appeal
- Non-compliance
- Low organisational trust
- Supply chain ungovernability

Exacerbate counterfeiting

Brands that use insecure IDs are more vulnerable to attack, as they provide counterfeiters with a simple and undetectable way to replicate and sell their products. If not implemented securely, the Digital ID can become a product's Achilles' heel. A solution aimed at reducing counterfeits may inadvertently worsen the problem, ultimately harming the brand, consumers, and the environment.

Product identity theft

When counterfeiters clone a product's marker they effectively steal the identity of the product and the information that goes with it. The theft of a product's identity, product passport or digital twin not only gives counterfeiters a simple way to make their products appear more authentic and increases a brand's risk of becoming the target of counterfeiters. Cloned IDs can be applied to any illicitly produced



product to benefit from certifications and content. Illicit products risk disrupting the performance and efficiency of a brand's ecosystem of services if they are not prevented from entering.

Erosion of consumer trust

Digital IDs for products raise consumer expectations, and insecure IDs can lead to conflicts between brands and consumers over product authenticity. This issue becomes more pronounced in re-commerce, where consumers rely heavily on authentication when buying and selling used items, increasing the likelihood of encountering cloned IDs. If a brand cannot differentiate its genuine products from fakes with cloned IDs and manage consumer experiences in these sensitive cases, consumers may avoid the brand altogether. It is therefore crucial for brands to implement secure digital ID systems to maintain consumer trust and avoid negative repercussions.

Reduced sustainability

Inadvertently giving counterfeiters the opportunity to create more convincing fakes, and having no means to intercept, recognise and manage the issue, means that fakes will circulate in greater numbers and negatively impacting the brands sustainability.

Reduced brand appeal

Brands that focus on protecting only their ecosystem of services and ignoring the issue of fakes that are free to circulate in the ecosystem of third parties such as resale market-places face punishment from the market. Market-places face growing regulation to protect consumers from fraud. Brands that provide third-parties with the support and tools to help them reduce their exposure to legal risks will inevitably be favoured over those that don't.

Non-compliance

Upcoming regulations are expected to require secure authentication for products. Failure to comply with these regulations can subject brands and manufacturers to legal and reputational risks. Counterfeit products can also raise concerns regarding manufacturer responsibility. If authorities are unable to distinguish between genuine and non-conforming products with cloned IDs, the brand could be held accountable for the production and distribution of illegal products, even if they were not directly involved in production.

Low organisational trust

Insecure serialisation can compromise the reliability and accuracy of data, leading to a lack of trust among manufacturers and brands. This, in turn, can discourage investment in system improvements, further exacerbating the risk of counterfeiting and fraud. The integrity of the entire supply chain can be undermined as a result.

Supply chain ungovernability

To identify the root cause of counterfeit or substandard products, it may be necessary to trace them back through the supply chain. However, an unreliable or insecure serialisation system can impede this process, causing delays and supply chain disruptions.

Brands can mitigate these risks by adopting secure serialisation systems and by providing education and training to stakeholders on best practices for ensuring product authenticity and safety.



The anatomy of **secure** **authentication**





Security check-list:

The key to secure product authentication does not rely on a single marker type or ID-issuing technology. Rather, it involves a complex, interconnected system of multiple factors.

To ensure the successful and secure deployment of product authentication, **consider the following themes:**

- **Identity management**
- **Clonability and robustness**
- **Ease of use and scalability**
- **Fake detection rate**
- **Accessibility and portability**
- **Data generation**
- **Product lifecycle extensibility**
- **Ease of implementation**
- **Attention towards attack**
- **Ownership of validation**





Identity management

Preventing authentic IDs from entering the market by mistake requires securing not only the identifier but also the marker, media, and the entire process of manufacturing, distributing, applying, and activating the ID across a complex, distributed supply chain. Have you considered all of these factors in ensuring secure product authentication?

Clonability and robustness

What measures have you put in place to recognise duplicate IDs? If you've adopted a solution believing it will not be copied, chances are that it will somehow, at some point, and you won't realise it. You should be prepared for this instead, so evaluate your ability to manage the consumer experience when they encounter non-genuine authentications, for which there are many varied use cases.

Ease of use and scalability

The effectiveness of product authentication depends on selecting the appropriate marker technology that meets both your needs and those of the consumer. Consider whether your solution can be scaled for all of your products, how user-friendly and efficient it is, and whether consumers are aware that your connected services exist. Have you considered the cost vs benefit of reduced product authentications and the impact on your brand's ability to intercept and take preventive action against counterfeiters?

Fake detection rate

While it's important for a solution to be able to identify genuine products and prevent non-authentic ones from entering a brand's ecosystem, there's also significant value in proactively intercepting and reclaiming control of counterfeit products. Consider the volume of fake products your solution can intercept to maximise its effectiveness.

Accessibility and portability

Authentication of product information is a valuable tool for a variety of stakeholders, including returns management processing teams, clients, customs officers, and others. The ID associated with a product contains valuable information, making it essential that it can be easily shared and authenticated by all actors in the value chain. Is your product's ID readily accessible and verifiable by all relevant parties throughout the value chain?

Data generation

It is important to consider the amount of data generated by authenticating your IDs and whether your organisation has the capability to unlock the value of this information. This data can be utilised to monitor grey markets, enrich CRM profiles, and more. Are you equipped to efficiently leverage the valuable insights generated by your authenticated IDs across your organisation?



Product lifecycle extensibility

Assessing the efficacy of your solution in tracing, monitoring, and monetising products after their initial purchase is crucial. It is essential to determine whether your ID and authentication solution can be fully leveraged throughout the entire product lifecycle. Are you equipped to effectively utilise your solution to its full potential in tracking and profiting from products from production, to beyond their initial purchase and past end of life regeneration?

Ease of implementation

When selecting a solution, it is critical to consider whether it has been proven and industrialised at scale. Additionally, the solution must meet international privacy standards, be quickly implementable without disrupting existing workflows, and be interoperable and easy to integrate with your systems. Does your chosen solution satisfy these requirements?

Attention towards attack

Counterfeiters, like hackers, are constantly searching for vulnerabilities and developing new attack methods. To keep up with these threats, it is essential to have the necessary resources and experience in place. Are you equipped to stay ahead of the enemy and protect against counterfeiting?

Ownership of validation

The outcome of a product authentication check can have significant business implications, and it is critical to determine who will take responsibility for ensuring the trustworthiness of authentication responses. Who will assume this responsibility?



Secure by design™

Secure by Design™ is the capability to implement and manage connected product projects with security in mind, from day one, thanks to a deep knowledge of counterfeiting practices and of the vulnerabilities of common implementations.

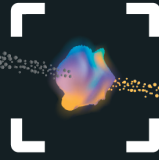
Failure to include the capability to reliably verify the authenticity of connected products and to detect fake replicas voids the brands' investments into expensive product connection technologies that start from traceability and go all the way down to consumer-facing circular services. However, the key to secure product authentication does not rely on a single marker type or ID-issuing technology. Rather, it involves a complex, layered system of multiple and interconnected factors. By making security a key pillar of their digital ID strategies, and ensuring they are supported by a dedicated experienced partner, smart brands will avoid the pitfalls of insecure authentication and obtain

increased returns on their investment by leveraging authentication throughout the circular lifecycle of their products.

We hope this paper has helped you dispel some of the most common myths around connected products and secure vs non-secure authentication technologies. Most of all, we hope that you will take our suggestions into account as you take another step towards building a connected future for your brand, or making your current implementation stronger.

Certilogo can integrate with any existing system, so feel free to reach out if you think you might benefit from the world-leading Secure by Design™ solution.





About Us

Leading the Connected Products Revolution

Our purpose is to empower brands to build the most trusted, engaging, measurable, and sustainable relationships with consumers through their products.

We do that by turning analogue products into secure smart digital assets that are empowered to convey trust, and generate greater value for brands, consumers, and the planet alike. We strive to democratise the affordable delivery of the most reliable authentication, relevant information, compelling services and engaging experiences; enabling brands to monetise their products beyond the moment of first purchase, while collecting insights that support traceability, commercial, marketing, brand protection and sustainability strategies, throughout the entire omnichannel consumer journey and circular product lifecycle.



2018 Winner
Best Use of
Artificial Intelligence
in Fashion

Certilogo has unparalleled experience in the industrialisation of secure digital marker and product recognition technology and its application in delivering product authentication, traceability and portable product identities. Our specialist knowledge extends to the delivery of affordable and effective connected product consumer experiences and leveraging the value of product engagement throughout the organisation.

Our customer-centric and service-oriented approach means brands can join the connected product revolution in weeks, not months. While a consumer-centric approach to the consumer experience ensures the most effective engagement, results and satisfaction. Building trust is in our DNA. Products connected with Certilogo are secured with best-in-class “Secure-By-Design™” digital authentication technology that underpins every aspect of our solutions.

Learn more at discover.certilogo.com or [contact our experts](#)

More Resources

Discover more useful resources to assist your connected product strategy
 Visit our [online resource library](#)



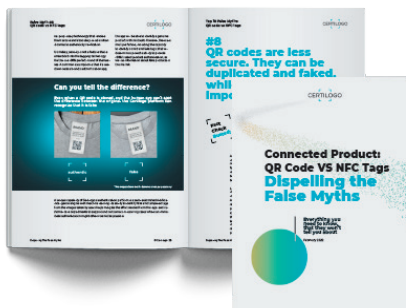
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**Connecting
Products with
People for
Brands**



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