Preventing underage alcohol purchasing online using payment card details

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Age assurance online needs improving

With the increasing reliance on digital services for purchasing physical goods, there is a growing need to uphold the legislative requirements for age assurance online, in addition to a responsibility on businesses to only provide products to those who are of an appropriate age.

Many existing age verification and assurance solutions focus on either unverifiable data (such as honesty policies, uploaded documents, and artificial intelligence) or data verified using authoritative databases causing the leakage of data about a purchaser's habits.

Use of 'Merchant Category Codes' could be expanded for more age-restricted products

Every time a payment is made using a debit or credit card, a Merchant Category Code (MCC code) is transmitted along with the payment details to identify the type of transaction. This is already used to enforce UK legislation such as banning under-18s from online gambling payments and could be expanded to provide a general-purpose protection when selling age restricted products, such as alcohol. The use of MCC codes would require a small change to payment authentication processes at banking institutions, along with a progressive adjustment to e-commerce software to pass the required data with the required levels of privacy protection.

This report outlines the context and solutions that could be developed to implement this additional check, helping retailers to maintain regulatory standards when selling age restricted products both online and offline.

Recommendations for banks and online retailers

Implementing MCC code-based age assurance mechanisms would allow the staged roll-out of an additional technique providing a baseline standard for protecting those under-age from making inappropriate age restricted purchases. Such mechanisms could be used in combination with other active techniques to provide a high level of age certainty for retailers.

Terminology

Key terminology used throughout this report are defined below.

Acquirer bank

The bank processing transactions for a retailer.

Active age assurance

Systems that require the user's engagement to ascertain their age.

Age assurance

Any system that can provide information about the age of a customer. This could be a precise age, an estimate, or an age bracket.

Age check

The process of checking a customer's age for the purpose of applying age restrictions.

Age gating

Implementing a system which only allows use by customers within a particular age bracket.

Age restriction

A minimum age to purchase a product, as specified by law, industry practice or retailer preference under their duty of care.

Age verification

The process of accurately verifying the age of a customer using official documents, e.g., Government issued ID.

Artificial Intelligence

Any system that makes estimates of data based on previous input.

Card scheme

A payment network linking banks allowing their cards to be used by payment through any other bank's system. The two largest are Visa and MasterCard.

Issuer bank

The bank with which the card holder has an account and processes their transactions.

MCC codes

The four-digit codes used within payment transactions to identify the type of business where goods have been sold.

Merchant

A retailer receiving card payments from customers.

Passive age assurance

Systems that do not require the user's engagement to ascertain their age as all processing is transparent to the user.

Introduction

Amid the Covid-19 pandemic, online alcohol sales have risen by 18.9% in the UK (1), with a corresponding increase observed in off-trade sales (2). This has accelerated the online trend with the launch of many new instant delivery apps taking advantage of legislation and guidance to stay at home and work from home if possible (3). The increase in consumer reliance on delivery apps remains as a behavioural change, with no substantial decline in use following lockdown periods (4). Compared to physical sales, there is a lack of research into the volume of potentially underage online alcohol purchases and the mechanisms used by retailers to prevent them.

The increase in online sales of age restricted products has not been matched by the development of legislation, with the abandonment of the Digital Economy Bill 2017 and upcoming Online Harms Act and Age Assurance (Minimum Standards) Bill. In addition to the legal requirements, 81% of online retailers understand that strengthening age assurance can help to protect their brand reputation (5).

Some retailers and online providers currently utilise a range of techniques to implement age restricted sales. These often require user interaction with additional apps or services, providing personal information over and above what is required for a transaction. Many other retailers delay the age verification process until delivery, with a doorstep check of Government-issued identity documents either by their own drivers or courier service. This is a challenging environment in which to check documents and refuse delivery, especially with contemporary social distancing and contact-free requirements

Industry standards

Current and upcoming industry standards aim to implement a minimum baseline approach to age assurance, combining multiple sources of data where possible to increase confidence in outcomes. This provides the space for various active and passive measures to reduce the risk of those underage gaining access to inappropriate age-restricted products.

Age restrictions

This report provides recommendations for ascertaining whether a customer meets minimum age requirements when purchasing age restricted products such as alcohol. These requirements may vary by national and international jurisdictions. The system outlined would permit localised variation of age restrictions without the explicit specification of age boundaries or assumptions about particular classes of age restricted products. This facilitates future legislative changes and cultural applicability.

Prior research

This report builds upon our prior research analysing the online age gating landscape and providing recommendations for improving age assurance techniques (6). The proposed system detailed in this document is developed from the ideas discussed in the prior work.

Key terminology

Within the age assurance space, there are three different names applied to techniques to describe their effectiveness. The diagram in Figure 1 below shows the hierarchy of these names.

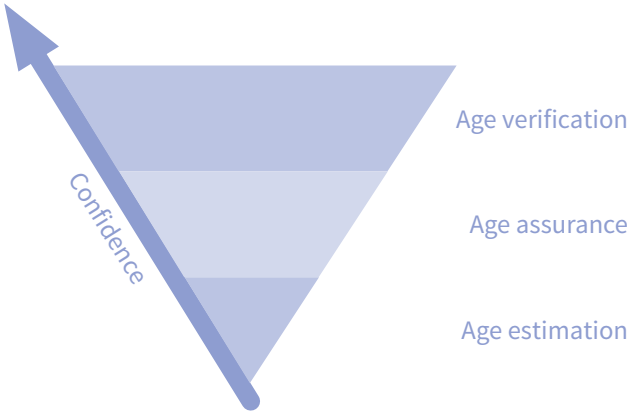

Figure 1: Age assurance classification, with increasing confidence in customer's age.

The simplest form is ***age estimation***, where systems provide an informed guess to an individual's age. This provides the least confidence, as only a general age category can be ascertained without further proof.

With increasing confidence in categorisation, ***age assurance*** is the general name applied to the field where information may be provided by a user, and/or combined with informed estimations and risk-based analysis. Age assurance may not be highly accurate in every situation; however, it can often provide enough surety for most contexts.

The final categorisation, ***age verification***, is where absolute, verifiable proof of age is available in the form of authentic, genuine documentation or access to official databases. Of all age assurance methods, age verification has the highest confidence.

Each of these terms are described in an online context below.

Age verification

Age verification is the term given to the process of verifying that an individual meets minimum age requirements for the purchase of a product or access to a service with certainty. For most people, the most common age verification method they may encounter is being requested to show ID such as a Driving Licence, Passport or PASS (National Proof of Age Standards Scheme) card within a supermarket to buy products such as alcohol, ensuring that the business meets their legislative requirements under the Licensing Act.

This method of age verification relies on a trusted source, the issuer of the identity document, to have pre-verified the individual's age and provided a secure means of identifying the person.

Within our increasingly online world, age verification can prove problematic for a variety of reasons. Since the beginning of the web, there has been a general movement towards maintaining the privacy of users, with those purchasing online not willing to give more details than necessary for a transaction. The risk of fraud can also lead to users being unwilling to submit photos of their official identify documents to unknown services.

Many leading retailers focus on age verification for online sales at the point of delivery, leaving the task of refusing sales to drivers who often receive minimal training in handling age verification, are sometimes employed through a third party, and are placed in a difficult position with customers unable to provide official identity documents on the doorstep. This can also place additional cost on the business when transporting items to a customer and then unable to leave the items, requiring additional cost returning them to store if the recipient cannot prove they are above legal age. Some apps such as Deliveroo accept wastage as the cost of failed delivery, instructing their delivery drivers to dispose of the age-restricted products responsibly (7).

Age assurance

The term age assurance reflects the modern digital environment where fully burdening users with the requirement to verify themselves using secure documents is more challenging. Even

where online databases exist where documents can be securely verified, there is little proof that the user is the person they claim to be.

The VoCO (Verification of Children Online) Project (8) developed a taxonomy for the differences between age assurance and age verification, with the key variances highlighted in Table 1 below.

Age assurance	Age verification
Technique depends on risk of harm	Requires high confidence
Safeguard minors and their experiences	Block access to minors
Know age	Confirm age

Table 1: Comparison of age assurance and age verification as specified by the VoCO project (2020).

Considering the scenarios where age restricted products may be purchased online, it is evident that legislation on most products requires absolute proof of age, i.e., age verification rather than assurance. This requires blocks on accessing certain products in the absence of confirmation of age through an authoritative and verifiable method.

Age assurance may be appropriate for contexts where content can be tailored to the user, with a varying number of ***age bands*** to deliver appropriate content. There are no age restrictions where this would be applicable.

Age estimation

The least confident classification of techniques for retailers is ***age estimation***. Estimation requires no identity or proof from the customer; however, it has the lowest chance of accurately providing their age. Within physical contexts, age estimation is useful in applying existing Challenge 25 policies, though in online spaces these are best applied in conjunction with other age assurance methods.

Summary

The level of age assurance required by an online e-commerce system depends on the retailer's risk and required compliance. Depending on the context and products, this could require full verification using official sources of authoritative data, uploading proof from the customer or combination with artificial intelligence systems. This report proposes an age verification system that would be suitable for alcohol sales as well as other products, provide high levels of confidence, can be combined with other techniques and implement a baseline assurance for retailers.

The next section describes the regulatory landscape, including key legislation, age restrictions and industry guidelines.

Regulatory landscape

Within UK law, there is no one definitive act which governs the sale of age restricted products online. Instead, retailers are required to comply with several different key pieces of legislation, each of which applies to a class of age restricted products or the digital platform. The main legal requirements are discussed below and summarised in Appendix 1.

Substances

Alcohol

The Licensing Act (2003) in England and Wales and the Licensing (Scotland) Act 2005 are the main legislative acts that applies to alcohol sales within the UK. Drafted at a time when the Internet was in its infancy, the Licensing Act focused mainly on the sales both on and off premises involving physical purchases where the purchaser is present. This is reflected in the four[1] licencing objectives, only one of which (the protection of children from harm) is directly related to underage sales.

Whilst the Licensing Acts are clear that the sale of alcohol to those under the age of 18 is illegal, there is ambiguity when this is translated into an online space: should age verification take place at the point of sale (when a contract is formed), or upon delivery (where the harm may be caused) (6).

Cigarettes and nicotine inhaling products

From October 2007, the legal age to purchase tobacco in the UK was raised to 18 under the Children and Young Person's (Sale of Tobacco etc.) Order (9). Due to the association between smoking and alcohol amongst young people (10) there have been calls to raise the age restriction on tobacco and other nicotine inhaling products to 21 in order to protect young people.

With the rise of e-cigarettes, The Nicotine Inhaling Products (Age of Sale and Proxy Purchasing) Regulations were introduced in England and Wales in 2015 (11). This extends the ban on sales of nicotine-containing products to those under the age of 18.

Psychoactive Substances

The UK-wide Psychoactive Substances Act 2016 introduced age restrictions for many products such as solvent-based glues, marker pens, aerosol, anti-freeze, and nitrous oxide. The Act does not specify a specific age restriction for such products, though enforces an approach where retailers are left to make a judgement on whether the purchase is appropriate and likely to be abused. Despite the vague nature of the law, retailers often apply their own 16+ or 18+ policy to such products in an attempt to protect those underage. This is consistent with existing provisions within laws such as the Anti-social Behaviour Act 2003 for the prevention of sale of aerosol paint to those under the age of 16.

Gambling

Since April 2020, gambling transactions placed through credit cards have been banned in the UK (12). This law aims to protect vulnerable members of society from building debts due to betting of all forms (except the National Lottery, which is handled by separate legislation). The technical measures blocking transactions involve rejecting credit card transactions for particular MCC codes (see p. 26). This demonstrates the ability of industry to respond to UK Government policies and social responsibility by making small changes to the existing payments system.

1 Protecting and improving public health is included as a fifth licensing objective in Scotland.

Other age-restricted products

Fireworks

Fireworks are classified as age restricted products under the Pyrotechnic Articles (Safety) Regulations 2015 and are classified into several categories with different age restrictions as shown in Table 1.

Classification	Typical articles	Age restriction
-	Christmas crackers	12
F1	Indoor fireworks, e.g., party poppers, sparklers	16
F2	Outdoor fireworks, confined areas	18
F3	Outdoor fireworks, large open areas	18
F4	Specialist display fireworks	18
T1	Theatrical pyrotechnics	18
P1	Other pyrotechnics	18

Table 2: Firework classifications and age restrictions.

The sale of fireworks at category F2 and above is highly-controlled with time limited periods of sale from registered retailers. Online retailers often enforce age restrictions by checking the ID of those appearing under 18 at the time of delivery, with no specific regulations required for e-commerce sales.

Knives

In the UK, it is unlawful for those under 18 to purchase knives (unless they have a manual folding blade less than 3 inches long)[2] (13). This restriction aims to protect children from the dangers of bladed products and is generally well-enforced by retailers under their standard Challenge 25 policies.

Movies and video games

The purchase of age restricted movies and video games is restricted through the Video Recordings Act (1994) and later labelling regulations. These specify the British Board of Film Classification (BBFC) as the ratings classification body for DVDs and the VSC Rating Board having a similar role for video games (14). Each body has its own age classification scheme that retailers must enforce at the point of sale. Many physical retailers apply their Challenge 25 policy to ensure purchasers provide appropriate official ID prior to purchase, however this is not replicated on many e-commerce sites, where there is either a failure to verify age restrictions or the risk is transferred to delivery drivers.

National Lottery

Since the establishment of the National Lottery in 1994, it has been regulated by separate laws to the gambling industry. Following a consultation on age restrictions, the minimum age to purchase both lottery tickets and scratch card products has been raised to 18 from October 2021 (15). This aims to protect children from gambling-related harms, with the age restriction in line with other forms of betting.

Most physical retailers were already well-placed to deal with the change in age restriction, extending their existing Challenge 25 policies (see p. 16). National Lottery accounts created through their website or app perform age assurance checks through Experian's databases (based on electoral roll records and credit databases), with additional government-issued identity documents required for all players winning higher-tier prizes over £50,000 (16).

Online environments

With the rapid growth of children's access to the Internet during the 2000's, there was a move by industry, Government and non-governmental organisations to implement regulations to protect those underage from harm. This section summarises some of those attempts at enforcing appropriate age restrictions.

2 In Scotland, there is an exemption to allow those aged 16+ to purchase cutlery and kitchen knives.

Age Appropriate Design Code

In 2019, the Information Commissioner's Office launched the Age Appropriate Design Code (17, also known as the Children's Code), coming into full effect from 2nd September 2021. The code applies to most online services, including all websites selling goods using the personal data of UK children. Along with regulations on the management of data whilst respecting individuals' privacy, the first standard requires all services to be designed in the 'best interests of the child'. This primary consideration suggests that all e-commerce retailers design their platforms in a responsible manner, protecting children from harmful content and products wherever possible.

The Information Commissioner's Office advises that the design code requires age-appropriate application, particularly where personal information is used for age verification (18). Whilst the advice focuses on online services, the general principles also need to be applied to websites and apps that sell products to consumers, 'done in a way that minimises disruption to access by adults and the collection of additional data and should avoid adding friction to user experience' (ibid, p. 33).

Digital Economy Act

The Digital Economy Act (2017) (19) was introduced by the UK Government as an attempt to improve online protections for children and other vulnerable persons, building upon the previously proposed Digital Economy Act (2010). Prior to the 2017 Act, enforcement of digital age restrictions was disparate and depended upon responsible retailing.

The most discussed element of the Digital Economy Act was Part 3, related to online pornography. The initial proposals created a regulatory framework based on BBFC classifying online websites, and all users accessing those rated 18+ requiring mandatory age verification via credit cards or physically purchased tokens.

Due to privacy concerns, lack of regulation of non-commercial platforms and prevalence of Virtual Private Networks (VPNs) to avoid the blocks, the online pornography elements of the Act were scrapped in later 2019, with a new expectation of duty of care amongst content providers.

Online Harms Bill

As a renewed attempt to protect vulnerable people including children from harmful content on the Internet, the Online Harms Bill will introduce measures for social media platforms, apps, and content publishers (20).

The Online Harms Bill relates to digitally provided content only, with no provisions for controlling the sale of age restricted or unsafe products, leaving enforcement as a part of existing legislation.

Industry guidelines for the sale of alcohol

In addition to the regulatory requirements discussed above, there are several guidelines used within industry to aid retailers in their duties to not sell alcohol to those under-age. The key guidelines are discussed below.

Challenge 25

The Challenge 25 policy (an evolution of the Challenge 21 policy applied by many retailers in response to the upgraded Licencing Act) is the predominant strategy used by supermarkets and other retailers when deciding whether or not to sell age restricted products, and is now run by the Retail of Alcohol Standards Group. To assist retailers in their duties not to sell to those underage, the policy specifies that anyone looking under 25 is requested to provide official identity documents to prove their age upon purchase of age restricted products. This policy has been adopted by most large retailers, reflecting the difficulty for shop workers assessing an individual's age. This policy is applied by many retailers to their age verification upon delivery, with drivers applying the same standards.

International Alliance for Responsible Drinking (IARD) Global standards

The International Alliance for Responsible Drinking, a non-profit organisation supported by global alcohol producers, has published guidance for retailers in the form of the Global Standards for Online Alcohol Sale and Delivery (21). This provides a framework for online retailers to address some of the concerns around delivery to those under-age by placing the burden for age assurance on delivery drivers.

Age Assurance

The Age Assurance (Minimum Standards) Private Members' Bill was introduced to the House of Lords on 27th May 2021 and is currently awaiting second reading. If passed as a law, the Bill proposes that Ofcom are responsible for publishing a minimum set of standards under which all age assurance systems must comply. The key minimum standards would be consistent with the ICO's Age Appropriate Design Code, aiming to protect consumers privacy by maintaining secure and proportionate procedures for implementing age restrictions. This would introduce an additional level of Government enforcement for age assurance systems which do not protect their users or comply with appropriate industry standards.

Summary

Within UK law, the regulatory requirements for selling age restricted products are complex and spread across many different key pieces of legislation, which introduces unnecessary variation in terms of expectations, implementation and regulation (22). The aims of protecting those underage are the same no matter the age restriction or potential for harm, and a unified approach to all such products is key for retailers to ensure they comply with their legal responsibilities. Providing mechanisms for age assurance which a) do not rely on individuals making subjective decisions, and b) block online purchases by those without correct proof of age, will help reduce under-age sales of products such as alcohol.

The next section of this report reviews the various age assurance technologies used by online retailers.

Age assurance technologies

For ecommerce retailers operating on the Internet, age assurance technologies can be classified depending on the amount of required user interaction and the amount of 'friction' or difficulty of purchase this creates for customers when navigating the system. Friction of use can occur in many forms, such as the need to purchase an additional identifier requiring a physical shop visit (token purchase) or uploading photos of personal identity documents. Low friction technologies are often favoured by retailers as they make it more likely a purchaser will complete a transaction, though they are often associated with lower levels of age assurance. The author's diagram in Figure 2 shows the most common age assurance technologies mapped against dimensions of active/passive and amount of friction for the customer.

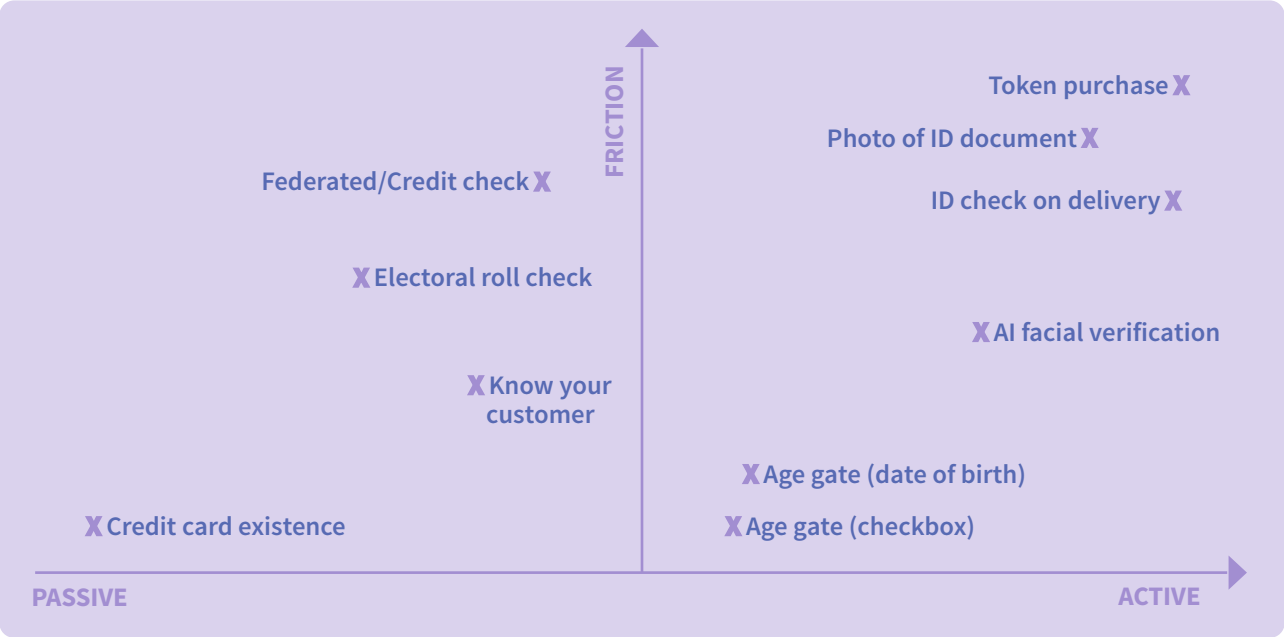

Figure 2: Author's map of age assurance technologies along dimensions of customer interaction (passive/active) and friction (difficulty of use).

Appropriate age assurance technologies for a particular context will depend on the level of verification required and the amount of difficulty a retailer is willing to place in the way of a customer ordering products. For example, checking for a credit card requires little user interaction, causes little friction for the customer and does not provide a high level of confidence that the customer is definitely of a particular age. At the other end of the scale, requiring a customer to purchase a token in an offline retailer before shopping for age restricted products online requires a high level of user interaction (friction to the buying process) and a large amount of interaction with the system.

Each of the age assurance mechanisms are discussed in more detail below.

Active

Active techniques rely on the customer either confirming their age using the on-screen interface or images/video taken during the process. Alternatively, the customer may be required to provide additional details and interact with other systems.

Age gates

The simplest and prevalent form of age verification on websites is the ***age gate***. Age gating has been around since the early days of the web to satisfy regulators by taking measures to protect those under-age. Typical measures include asking the user to check a box to confirm they are over 18 or requesting a date of birth for calculation of age as shown in Figure 3. With no means of verification, these are weak devices and easy to overcome for website users, forming little to no barrier to those determined to purchase age restricted products (23). It is estimated that up to 56% of websites with age restricted products or services rely solely on age gating mechanisms to protect those underage and comply with legal age check requirements (24).

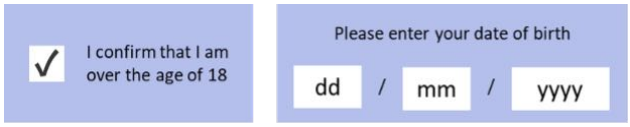

Figure 3: Typical age gate devices, including (a) simple checkbox confirmation and (b) date of birth input.

Photo of ID document

Another active method commonly used is requesting the customer to submit a photo of their government-issued identity document. This can show that someone with the same name and possibly address as the customer is of age, however digital image editing software means it is often straightforward to modify the photo of an existing identity document. Most services do not attempt to verify the identity document as genuine, and this is a challenging task to conduct remotely using a static image.

Many customers are averse to submitting their official ID documents due to concerns around privacy, storage, and processing of data. Companies such as Google (25) suggest blocking out identifying details within the photo, thus making it easier for individuals to bypass the age checks.

Token purchase

Age assurance developments due to the Digital Economy Act 2017 led to the idea of pre-authenticated, age verified tokens. To verify age, the user would visit a physical retail store, where a token could be purchased upon production of a Government-issued identity document incorporating proof of age (subject to standard retailer Challenge 25 policies). No identity details are stored with the token, keeping its use anonymous.

Upon visiting an age restricted website or purchasing such a product, the customer would demonstrate that an appropriate token is in their possession thus proving their age. This mechanism relies on the inherent trust that a proxy purchase (where an adult purchases for someone underage) does not take place, and does not permit the flexibility to enforce the various age restrictions placed on products within the UK.

Artificial Intelligence facial estimation

Facial age estimation services such as Yoti's app are designed to use artificial intelligence techniques to classify a photograph of an individual into a broad age category. This has been demonstrated to provide a mean error in age estimates of 2.08 years (26), thus its estimates are on average approximately 2 years away from the actual age of the customer. Facial age estimation technologies have a place in broadly categorising customer age, however, cannot provide the absolute assurance required for the sale of age restricted products such as alcohol, particularly where a customer is close to the boundary of the legal age.

ID check on delivery

The current status quo with many large retailers with their own delivery services is to check ID upon delivery. This shifts the onus of age verification to those who are placed in a challenging situation on the doorstep to request ID and refuse delivery if appropriate. This has proven problematic when social distancing and contactless delivery has been in place due to the Covid pandemic, with drivers requested to

verify ID at a distance (27) where it is less easy to accurately read dates of birth, check photos match the customer and that a real document has been produced.

Many third-party delivery and courier services, such as the Royal Mail Age Verification Service (28), have initiated age verified deliveries, where the age of the receiver is checked by delivery personnel. These rely on the same process of assessing the receiver's age and requesting ID if appropriate. Unfortunately, many of these services only provide an 18+ option with no opportunity to specify any other required age restriction.

Passive

Unlike active age assurance, passive techniques happen in the background and often without the user's intervention. These processes are handled away from the user to ascertain their age before allowing access to age restricted resources or goods.

Passive techniques are often employed where organisations have direct access to an authoritative resource providing age assurance based on known attributes of the user. These can include name, address, and payment information.

Credit card existence

One of the earliest passive mechanisms used to ensure a customer is over the age of 18 is verification using a credit card. This technique was first piloted by mobile phone companies, allowing access to content deemed to be for 18+ only, and is now used by companies such as Google for access to 18+ YouTube videos (29) in compliance with the Audiovisual Media Services Directive (30). This is not a full age verification method, as users could either use the credit card of another individual (e.g., parent), or be a card holder themselves under the age of 18. There is no current mechanism for a merchant to identify the card holder's age.

Despite the lack of thorough validation through credit card verification, 61% of retailers use this as a means to inform their age assurance process (5).

Electoral roll check

The Electoral Roll records details of every individual 16+ who is registered to vote[3], along with their address and date of birth. The data is generally collected by local authorities and compiled into a central data source, updated monthly. Individuals can elect whether to be on the ***full*** register (available only for approved parties such as Government and credit reference agencies) or the edited or open register (available for inspection by anyone).

By verifying name and address details in the electoral roll, online services can check a customer's age, however there are several cases where this process may fail:

- Moving to a new house – If a customer has recently moved to a new house, it may take time for them to be registered by their local electoral office and included in the monthly updates.
- Under 18 – Whilst those under 16 should be included in the year prior to their birthday, this can be missed.
- Temporary addresses – People living away from their permanent home, e.g., University students, may not be registered at their temporary address.
- Same name – Multiple people with the same name at the same address, such as family members, will have different ages yet cannot be distinguished without further personally identifiable information.
- Lack of registration – Despite all those aged 16+ being legally required to be on the Electoral Roll, 13% of the UK population are either not fully registered or do not appear on the records (31).

3 Some elections require the voter to be aged 18+, however those 16+ should still be included on the Electoral Roll.

Checking the Electoral Roll can provide age assurance for those who are fully registered and lived in the same place for several years, however the cases described above mean that this cannot be used as a sole means of age verification.

Know Your Customer (KYC)

Many retailers already implement Know Your Customer (KYC) processes to reduce the risk of fraud in compliance with the UK's money-laundering legislation (32). This ensures that the retailer does not take on undue risk by accepting an order from a customer whose identity has not been sufficiently verified. This is normally achieved through the application of four key elements:

1. Application of a customer acceptance policy
2. Customer identification procedures
3. Monitoring of transactions
4. Risk management

The aim of KYC processes is not to fully verify the customer, rather to identify potentially suspicious orders or transactions for further analysis. Often this requires information from customers such as name and address, validated against information such as the electoral roll and card holder address. These details could be used to verify identity for age assurance purposes, however KYC protocols often do not require the validation of every customer for every transaction, and may not happen in real time.

Federated

The final type of passive age assurance method involves applying multiple technologies depending on the risk and context of the customer. This approach is advocated for retailers who want to reduce customer friction yet comply with their legal obligations, providing information from several authoritative sources (22).

These systems are currently in development, with alternative approaches such as single sign-on (as used by GOV.UK Verify (33) to allow one account access to various systems) and combining multiple authoritative databases (e.g., the service offered by Experian (34)). This is an evolving space, where future developments will lead to the growth of several federated services for use by retailers.

The key principle of federated services is to provide age assurance by combining official data to produce an age classification whilst maintaining user privacy. The MCC code technique described in this report could be a data source within federated services.

Summary

There are a variety of age assurance techniques available to retailers dependent on the risk of harm caused by inadequate age checks, legal obligations, and responsibility of the brand. Passive checks generally have less customer friction, providing fewer barriers to purchase for those of an appropriate age, whilst helping to reduce the chance of selling to those who are underage.

As demonstrated by KYC processes, age assurance can also help to prevent fraud by building a more accurate picture of the customer, allowing the retailer to reduce their overall business risk and deliver greater levels of responsibility.

Age assurance standards

With a growing number of age assurance providers and technologies, there is now a focus to create national and international standards for age verification techniques. This will provide consistent terminology and approaches across providers, ensuring age assurance platforms can be compared and combined more easily to meet the required level of compliance.

PAS1296:2018

The PAS 1296:2018 (a Publicly Available Specification, see (35)) is an age verification industry code of practice developed by the Digital Policy Alliance. As a specification, it aims to provide suggested terminology and processes that could be developed into a standard at a later date. The PAS enables retailers to reduce the potential risk to those underage purchasing age restricted goods online (along with accessing inappropriate content or services on platforms and apps).

1. The Specification introduces three different approaches to age verification systems:
2. Traditional approach – Retailer would provide their own internal age check mechanism.
3. Hybrid approach – Retailer performs some outsourced checks with external age check resources.
4. Federated approach – Retailer uses a federated external service to retrieve age related attributes on the purchaser.

These three approaches reflect the changing architecture of e-commerce and online systems, where providers seek to outsource age verification mechanisms to external third parties. In order to comply with GDPR regulations, personally identifiable information has to be kept to a minimum and handled appropriately.

Furthermore, the specification details how providers and retailers can ensure trustworthiness and compliance of third-party age verification services integrated into their systems.

PWI7732

PWI 7732 is a project supported by the DCMS (Department for Digital, Culture, Media and Sport) to transform the above PAS1296 into a full international standard. As a Preliminary Work Item (PWI) launched in April 2021, it is expected that a draft document will be published in late 2021 for consultation.

One of the key anticipated elements of the standard will be an introduction of the concept of ***levels of age assurance***, defining increasing confidence when combining different techniques. This would reflect the current situation where retailers and content providers may combine information from a variety of sources, producing a suggested age for the purchaser which may not have 100% certainty. The VoCO project (8) notes that this approach may be more suitable for online environments where users can choose which pieces of personal information to provide and how – an approach more closely aligned with the Age Appropriate Design Code.

Summary

The concept of an international standard for age assurance systems is supported by both Government and industry to provide common nomenclature and processes for adhering to legislative requirements and best practice. As PWI7732 works towards a full ISO (International Organization for Standardization) standard, the industry landscape will become clearer and potentially easier to regulate.

Payment processing

Introduction

Since the introduction of charge cards and debit cards during the 1950's, the global payment processing industry has evolved into a large network of retailers, banks, merchants and card schemes. Together, these organisations handle a growing number of card payments currently accounting for more than half of all banking transactions in the UK (36).

Online payment processing continues to use the same infrastructure, allowing the use of debit and credit cards from popular schemes such as Visa, Mastercard and American Express to be used for purchases from any e-commerce retailer.

The diagram in Figure 4 below highlights the process for a typical spontaneous e-commerce payment transaction.

The transaction begins when a customer enters their card payment details into the retailer's website to purchase a basket of goods [1]. The retailer then prepares a transaction record for their merchant containing the customer's payment details, amount of transaction and the type of goods being sold, specified by an MCC code [2].

The retailer's merchant, known as the ***acquirer***, forwards this transaction to the relevant card scheme [3], who send this to the customer's bank (the ***issuer***) for approval [4]. At this stage, the issuer can either approve or decline the transaction based on the balance in the

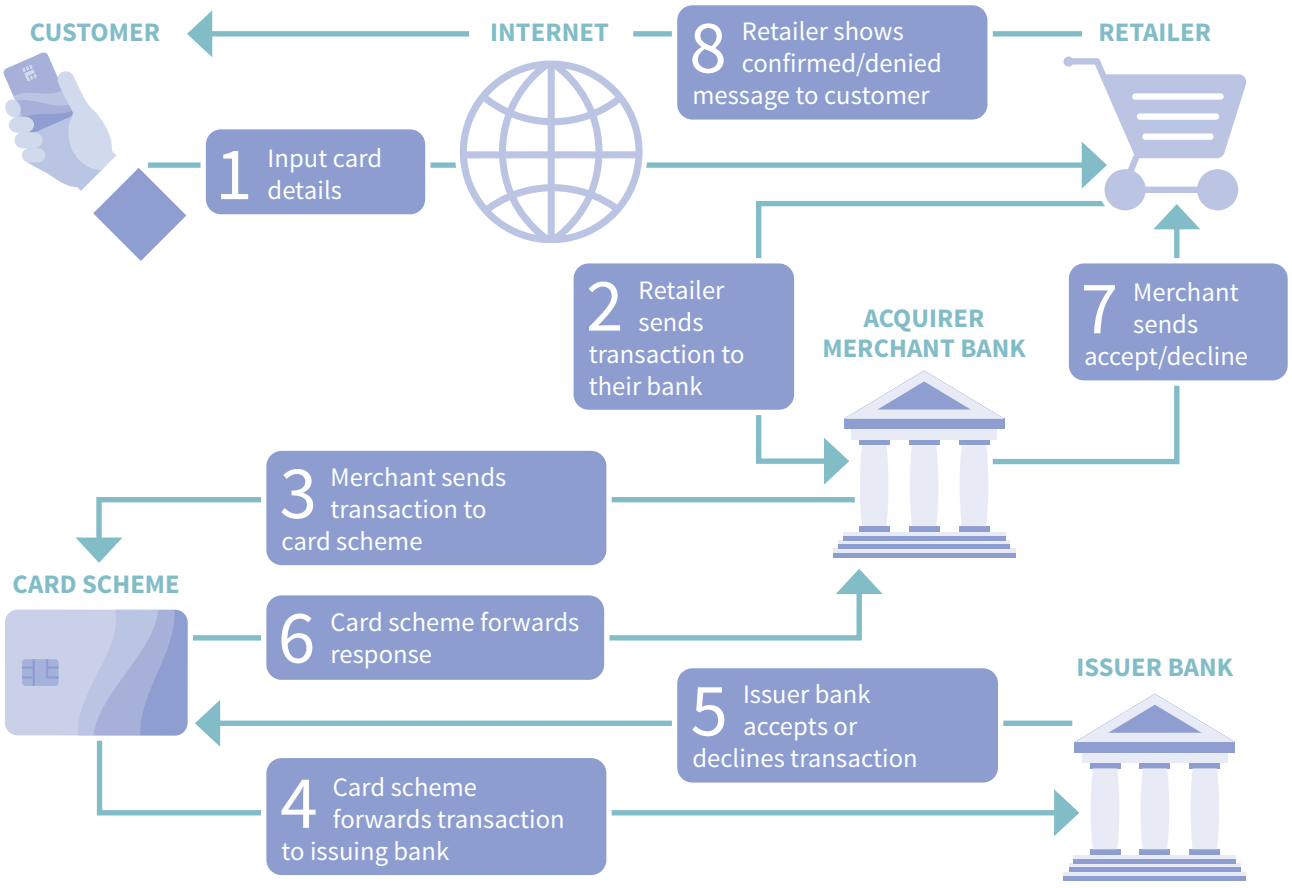

Figure 4: Spontaneous card payment processing showing a single transaction.

customer's account, their available credit, or the type of transaction.

The customer's bank then sends this decision back along the same path, first to the card scheme [5] who forward the transaction to the acquiring merchant [6]. The acquiring merchant then sends the decision back to the retailer, who can take appropriate action for the order [7]. This may involve approving the order and showing an order confirmation to the customer, or declining the order and showing an error message [8].

Whilst there are variations in the technical details for this process, all worldwide card schemes and merchants follow the same general pattern when approving payment transactions made by debit or credit card. This is facilitated by the use of standard payment transaction messages using the ISO 8583:2003 standard (37).

The same process is used for payments via any means, such as physical debit or credit cards via magnetic stripe, pin pad and contactless methods, or digital systems such as ApplePay or Google Pay.

MCC codes

A key element of the process outlined above is the specification of the type of goods being purchased. Known as the Merchant Category Code, or MCC code. This is a 4-digit identifier for the general transaction type. Common retail MCC codes are shown below in Table 2.

Merchant type	MCC code
Convenience Stores	5499
Discount Stores	5310
General Merchandise	5399
Grocery Stores and Supermarkets	5411
Miscellaneous Stores	5999

Table 3: Common retail MCC codes.

MCC codes are generalisations for the transaction, and do not contain specific details about the purchase. They are intended to provide banks with additional information on the transaction, facilitating the identification of purchase patterns and aggregate data reporting. Some businesses are assigned multiple MCC codes to represent either different businesses in one location or high-risk sales (e.g. for betting `7995` and pharmaceutical sales `5912`) and lower-risk sales within the same environment (38). Furthermore changing MCC codes is required within petrol stations, where the code `5541` must be used when selling fuel, but not for transactions only containing shop-based products (38).

Age exceptions

It is often considered in the UK that any individual holding a credit card must be age 18 or over due to the age restrictions at which a cardholder can enter into a credit agreement under the Consumer Credit Act (1974), however this principle cannot be universally applied as there are several exemptions that may result in a cardholder being under the age of 18.

Debit cards

Many high street banks offer debit cards to those customers aged 11–17 which should block transactions identified as gambling and have lower cash withdrawal limits. This prepares younger people for purchasing using payment cards in their adult life and allows them to pay for their own transactions either online or in-person. Due to their legal obligations, UK banks block transactions for purchases such as gambling and lottery tickets due to their under-age status.

On parent account

Whilst more common within countries such as the US, it is possible for those under-age to be issued with a credit card assigned to their parent's account. This is legally permissible as the credit agreement is made with their parent not the child, though does result in an under-18 having ownership of their own credit card.

Prepaid cards

With rising concerns of online fraud, prepaid cards are becoming more common within the UK. The first type of prepaid cards are available from many supermarkets and retailers, where they can be charged with a value to be spent online. Many such payment card issuers state that only registered cards can be used for potentially age-restricted transactions such as gambling or alcohol purchases, however empirical evidence has shown that this is often not the case (6).

The second type of prepaid cards are those specifically targeted at children, such as GoHenry. These are marketed to act as debit cards for children 6+, with parental oversight via an app. Such cards are intended to be blocked from under-age transactions, however this will not be the case where age restricted products are purchased within general retail environments.

Summary

Payment processing systems are designed to facilitate ease of payment both in-person and online and have means to identify the types of goods being purchased and the identity of the purchaser. Despite the presence of this information, it is often the case that cards held by those under-age or unverified can still be used for the purchase of age restricted products. The next section outlines the proposed use of MCC codes to implement additional validation checks within existing payment processing systems.

Proposed system

Implementing a baseline age assurance standard using the existing payment processing systems would require few amends to the existing process at the retailer, card schemes and their constituent banking institutions. The proposed system would work within existing transactional standards, facilitating an additional level of age assurance within existing e-commerce protocols.

The full technical details of the proposed system are available in our pre-print [ref].

How the system works

The main change within the proposed system is the use of alternate MCC codes based on the items within a purchaser's basket. This is analogous to the situation highlighted on p. 26 where some retailers such as petrol stations are required to dynamically change codes based on the sale of fuel.

Retailers would be required to identify any age restricted products within a basket and change the MCC code based on the most restrictive item. Most ecommerce solutions already allow for the storage of metadata related to age restricted products, and others could be easily modified to contain this information.

Age restrictions vary by jurisdiction; therefore, it would be the retailer's responsibility to apply the correct restrictions based on the delivery address of the customer (this being the place the contract has been formed, c.f. Licensing Act (2003) for alcohol).

After the customer has submitted their card details, the transaction record would be sent to the acquiring merchant bank including the alternate MCC within the payment information. This would be passed through the card scheme to the issuer bank, where any decision would be made. The response code would then be returned to the retailer, either `000` signifying ***approval***, or `119` for ***transaction not permitted to cardholder***.

The retailer would need to implement an additional error message within their system highlighting the refusal due to age restrictions to the customer. The customer may then be offered the opportunity to remove age restricted items from their basket, and re-attempt payment.

The proposed system would work for any retailer, with a focus on general e-commerce sales and delivery apps, though could be extended to all other retailers whether online or offline. The use of MCC codes extends existing practice within the UK gambling industry, preventing transactions with credit and pre-pay cards, in addition to debit cards issued to those under the age of 18.

What needs to be changed

To implement the proposed system, a few changes would be required throughout the purchasing journey. These would be invisible to the customer having no impact on their experience, except for any error messages because of an attempted under-age purchase.

Retailer systems

Retailer systems would be the focus of the required changes, though these would build on existing data and order processing procedures.

The first change is the storage of age restricted identifiers. Each age restricted product would need to be identified within the item metadata, with a flag signifying the minimum age to purchase the product. This could be applied at an individual item level, or for a category (e.g., beers, wines, and spirits). Many large retailers already store this metadata for use in their in-store POS (Point of Sale) systems, therefore the change would mainly affect smaller online-only retailers.

At the point where a payment transaction is passed to the acquiring merchant bank, the MCC code would need to be switched depending on the most restrictive product in the basket. A flowchart showing this decision-making process is shown in Figure 5.

To decide on the appropriate MCC for a transaction, the retailer's system iterates through each of the items, recording the most restrictive age requirement within the basket. Once all items have been accounted for, the retailer's system uses a lookup table to determine the appropriate MCC code.

MCC Codes

Identifying age restricted transactions would require the use of alternate MCC codes. Whilst the specific MCC codes would need to be determined based on transaction types, Table 3 below shows some indicative available codes that would be suitable for the age assurance process. These codes are currently unused and are consistent within the numbering scheme

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Age restriction	Proposed MCC code	Descriptor
12+	5482	Age 12 movies and video games
15+	5485	Age 15 movies
16+	5486	Age 16 video games, aerosol spray paints, party poppers
18+	5488	Alcohol, cigarettes, fireworks, knives, lottery tickets, solvents, age 18 movies and video games
21+	5491	No applicable restrictions in UK; however, could be applied in other jurisdictions e.g., USA
No restriction	5411	Overall basket has no age restricted products

Table 4: Proposed MCC codes for online grocery and delivery app transactions.

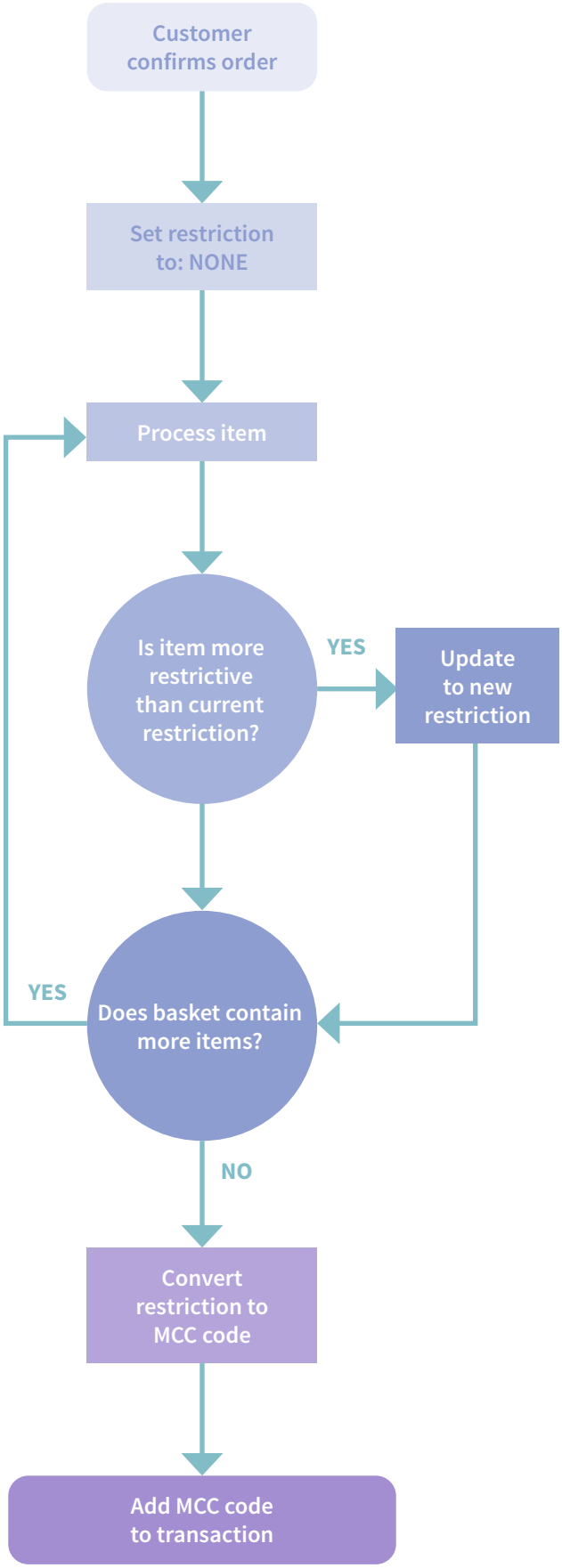

Figure 5: Retailer MCC decision-making process.

Card scheme transaction processing

All transactions within the payment processing architecture are handled within ISO 8583 format, a standardised message transfer protocol. By switching MCC codes, no modifications would be required to the protocol as all data would be transmitted within existing formats.

Banking institutions

For the acquiring merchant bank, the processing of the transaction would not require any changes as the MCC code is forwarded to the card scheme.

When a transaction using an alternate MCC code arrives at the issuing bank, additional software checks would need to be implemented to enforce the age restriction. These could take place after the existing transaction verification. The flowchart in Figure 6 demonstrates how the additional age verification process could be appended to the end of current transaction processing within the issuing bank's systems.

This process would result in an already-approved transaction being approved or declined in accordance with the relevant age restriction being applied. In the case of a declined transaction, the existing error code `119` representing ***transaction not permitted to cardholder*** could be used to signify the failure of passing the age restriction.

Further changes would need to take place within the issuing bank's reporting and aggregation software to include age restricted transactions within the appropriate categories. This would involve adjusting the internal mapping to include all age restricted MCC codes in the same category as the current code. Banks already perform regular updates to this mapping due to updates to the airline, car hire and hotel elements of the MCC code table.

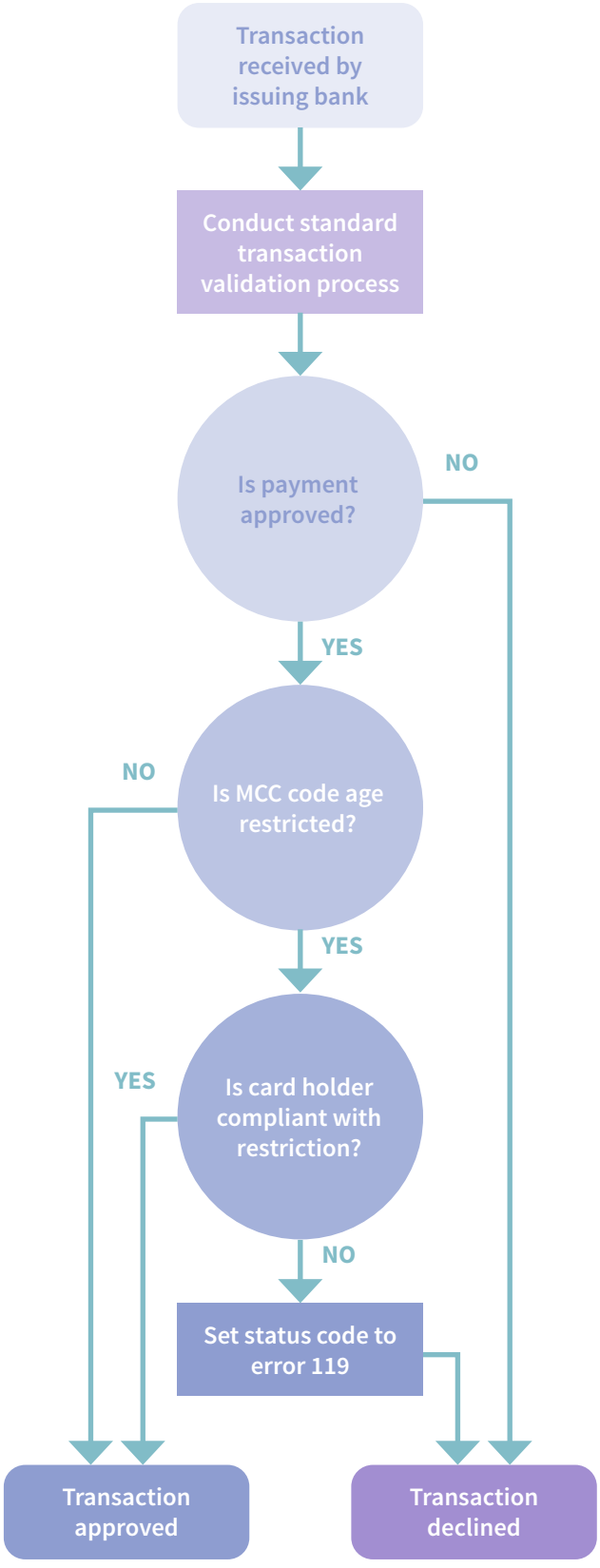

Figure 6: Flowchart showing the additional age verification process required at issuing banks.

Retailer interface

The final element requiring changes would be the retailer's order interface. If a transaction is declined due to the age check, the customer should be shown an informative message explaining the failure of the age verification process using their payment card. For most retailers, the opportunity to remove age restricted products for the basket would be the most appropriate outcome, ensuring the remaining items can still be purchased through a subsequent transaction attempt. Many e-commerce systems already permit changes to the basket and payment method after a failed transaction; therefore, this should be a minor change for most retailers.

Benefits of MCC codes

The use of MCC codes to relay age restriction information provides a convenient means to build the required checks into existing systems.

Existing systems

Any solution for age assurance through banking systems requires integration with the existing technical architecture. MCC codes are a standard element of payment transactions and included with the standard messages handled by all card schemes, therefore the use of alternate codes requires few changes to inherent infrastructure. The use of error code 119 is consistent with existing purposes and removes the requirement to add additional data for age declined transactions.

The definition of new MCC codes is already an occurrence for banking institutions, often involving airlines, car hire companies and hotel chains who have dedicated codes. The additional codes required for age restricted products could be added to the system through the same channels as existing changes and treated within aggregation and reporting systems as synonyms for general purpose retail transactions.

Progressive implementation

Adding age restrictions through MCC codes provides the opportunity for progressive implementation amongst card schemes, banks, and retailers. This could take a three-step approach:

Step 1	Card schemes add new MCC codes to their current tables and issue advice to banks through existing scheduled updates.
Step 2	Banks implement new MCC codes as synonyms for existing general retail codes. This would require the addition of the codes to the relevant group for reporting purposes.
Step 3	Banks and retailers elect to implement the necessary age verification checks.

The three-step approach would not require all banks and retailers to make the necessary changes within a specific timescale. Individual banks and retailers would be able to choose when to make the changes to facilitate the age verification process according to their needs, with the current and new systems running concurrently. In addition, this would not disadvantage card holders from different jurisdictions where the system may not be fully implemented.

Multiple jurisdictions

The use of MCC codes to represent individual age restrictions rather than categories of products is a deliberate design feature to permit use in multiple jurisdictions. At any point, the issuing bank is only requested to verify age against a target age rather than a specific legal restriction, permitting localised age verification based on delivery destination.

Passive age assurance

MCC codes provide a mechanism for passive age assurance with minimised user friction, meaning that customers who are of sufficient age to purchase products will have little interaction with the system, whilst it increases effectiveness at preventing underage sales. Passive techniques

such as this can benefit brand reputation and customer confidence whilst maintaining corporate responsibility by reducing the chance of underage sales breaching legislative requirements.

One of the key challenges in future age assurance systems will be consent fatigue, where customers will be requested to verify their age on many websites with several different mechanisms (40). This may lead to consumers using sites with less friction, as has been the case with GDPR cookies pop-ups. Implementing passive methods of age assurance will ensure that the customer journey is not disrupted by repeated age gating.

Protecting privacy

MCC codes are already used to distinguish between types of purchases, however no individual item information is sent to the bank. By only notifying the bank of the minimum age required to purchase a basket rather than the reason for the restriction, purchaser privacy is maintained.

Authoritative age verification

Many age assurance techniques lack a source of reliable, authoritative data on which to make judgements. Banking systems are heavily required to collect and confirm accurate customer information including their date of birth for tax and regulatory purposes. This often requires the production of Government-issued identity documents (e.g., birth certificate, driving licence or passport) in person for verification, a situation which is not readily available online. Retailers would be able to authoritatively trust the approval of age restricted transactions based on this customer data.

Integration with other age assurance techniques

The use of MCC codes may not be mutually exclusive to other age assurance mechanisms. Following the federated model and combining results from multiple age assurance systems (see p. 23) could provide a more effective barrier than relying on a single source of information.

Enforcing age restrictions through payment transactions would provide a baseline standard for retailers, providing sufficient proof that they meet legislative requirements whilst still permitting the use of other assurance techniques in cases such as the purchaser using another's card, banks not supporting the mechanism or payment not being made with a card.

Potential risks

With the proposed system, the customer's identity is verified with the using bank, however there are a few unlikely situations where someone underage could still purchase age restricted products.

Purchase with someone else's card

The main situation where an individual may inappropriately purchase age restricted products is when using another person's card – within the age assurance industry, this is known as a ***presentation attack***. As the purchase will be made using the specified card, there is no means for a customer to make a purchase with one card and verify themselves with another. This situation is the same as a proxy purchase where a customer buys on behalf of someone else. These types of attack are challenging to guard against with any system and rely on the responsibility of parents and other adults not to permit their card to be used for such purposes. Ordering for someone else is usually banned under the card holder terms and conditions.

This particular risk can be mitigated by considering the use of MCC codes as a baseline verification, in combination with another age assurance mechanism as described above.

Bank data not up to date

Given regulatory requirements for Government-issued ID when opening and operating an account, it is unlikely that the age of the card holder is unknown, however the verification mechanisms do still rely on the information held by the bank. Ensuring this is accurate is already a key issue for banks, therefore no additional risk or burden is placed upon them.

Unsupported by customer's bank

With the progressive implementation approach outlined above, it is possible during the transitionary phase that an issuer's bank would not support MCC code-based age assurance. In this case, the system would authorise the transaction, relying on a secondary method for age assurance. If implemented, banking procedures could allow for an alternative success code within the reserved regions (008–099) to indicate that the transaction has been approved without age verification.

Summary

Implementing an age verification using MCC codes would require a few small updates on the part of retailers and banks, though would deliver a secondary baseline to protect those underage from ordering inappropriate age restricted products online. The same mechanism could be extended to physical stores, providing a secondary mechanism for retailers to verify age of the card holder alongside the usual Challenge 25 policy.

Prototype

The prototype accompanying this report demonstrates a typical customer journey when using an e-commerce website or mobile app to purchase products from a retailer that supplies age-restricted products.

Simulation

As access to banking systems is heavily regulated, the prototype is implemented as a standalone simulation of the customer journey. This demonstrates the steps to be followed when applying the MCC code calculation process and the subsequent messaging to the customer.

Technical implementation

To enable readers of this report to experience the customer journey, the prototype is implemented as a standalone website. This allows access to see the process applied at several different stages of buying age restricted products and can be simulated using a variety of different pre-set payment card details with a range of accompanying ages/dates of birth.

Process

The prototype steps through each of the stages of a customer's journey through a typical e-commerce website, demonstrating the key processes and messaging displayed through the website or mobile app. The steps follow the flow shown in Figure 7.

At the start of the journey, the customer navigates to a website (or mobile app) offering age restricted products. Once at the website, they may view several products, and decide to add a subset of these to their shopping basket.

Once one or more items have been added to their shopping basket, the customer may choose to order the products through the checkout process. The first step is to calculate the MCC code. To select an age appropriate MCC code, the prototype iterates through each

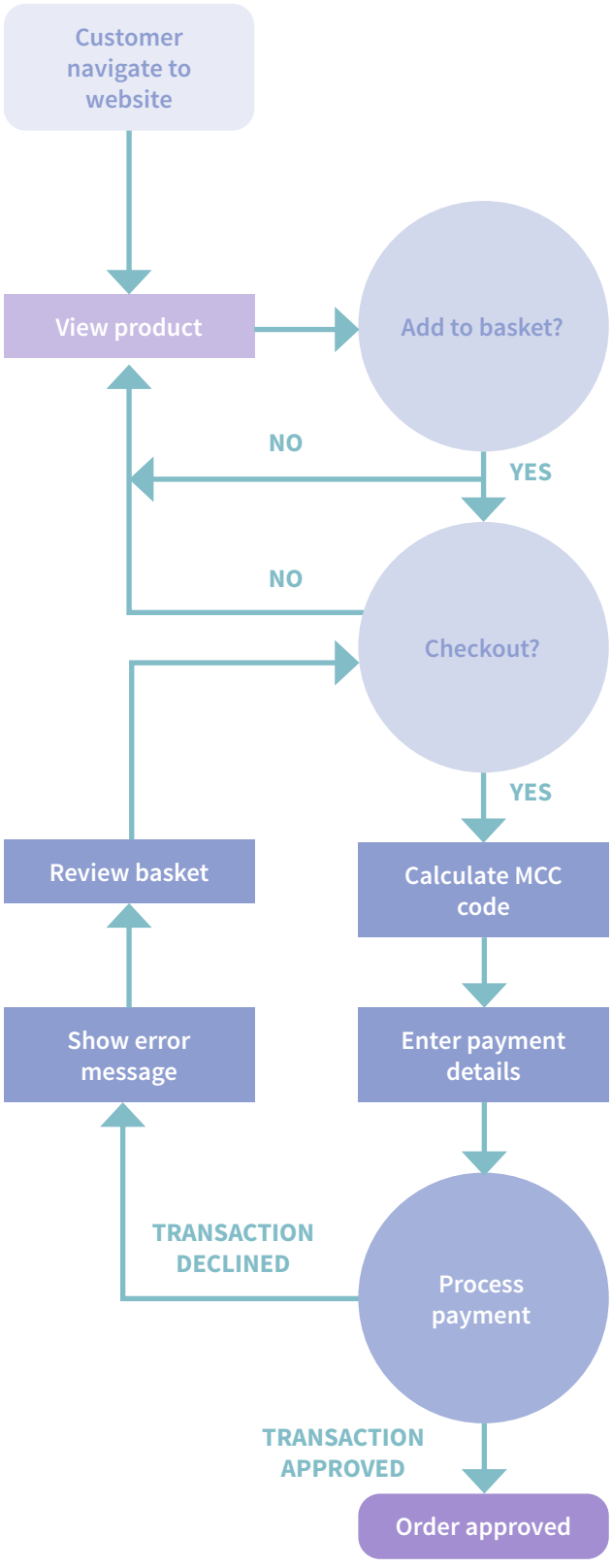

Figure 7: Prototype process flow following stages of e-commerce customer journey.

of the items following the process described in Figure 5 on p. 31, checking the age restrictions (if any) on each product, and identifying the most restrictive. When all of the items have been checked, the MCC code responding to the most restrictive product is applied to the entire order. For simplicity of implementation, the suggested spare MCC codes shown in Table 3 on p. 32 are applied. These facilitate the swift calculation of an appropriate code, with either a general code of 5411 applied to baskets with no age restricted items, or the calculation of:

MCC code = 5470 + most restrictive age

being used to signify the age restrictions. N ote that the algorithm is still applied to all baskets, whether or not age restricted products are present.

Once the MCC code has been calculated, the customer is requested to enter their payment information, including name, address, and card details. This follows existing e-commerce best practice and security requirements. To allow rapid testing of the system, the prototype supplies several pre-set card details with varying dates of birth.

When the customer clicks the final 'Pay' button, the prototype simulates submission to the acquirer merchant bank, and the appropriate response after processing via the card scheme and issuer bank.

There are two possible responses to the transaction: either ***transaction approved***, where the card holder's date of birth is validated as appropriate for the age restriction, or ***transaction declined***, where the card holder is not old enough to purchase all the selected products in the basket. For clarity in the prototype, further error states such as insufficient funds are not implemented, though would also need to be considered in any live system.

If the transaction is approved, the card holder's age has been validated as appropriate for the most restrictive product in the basket. The order is confirmed by the retailer, and a success error message is displayed to the customer.

However, if the transaction is declined, the order is not placed, and an error message is displayed to the customer. The prototype simulates this by explaining that the card holder is not of age to buy all the products in the basket. Whilst transparency of messaging is a key consideration of age assurance solutions (35), it is not possible to highlight to the customer which products are not available to them. The card holder's date of birth and age are never exposed through the transaction, with responses limited to a yes (***approved***) or no (***declined***).

The prototype then offers the customer the opportunity to revise their order by returning them to the basket page. It is anticipated that most retailers would want to offer the opportunity to remove age restricted items and re-attempt the order so that the sale is not lost, and age-appropriate items can still be ordered by the customer.

Results

The prototype demonstrates that it is possible to apply the MCC code method to online age restricted purchases whilst maintaining clear messaging to customers and not adding friction to the buying process. This would avoid retailers frustrating potential customers with procedures that are over-burdening or may lead to privacy questions around use of personal data.

Providing a system that is easy to use, is an extension to existing systems, and provides a baseline age assurance mechanism would help retailers to maintain their legislative duties and maintain responsibility towards their customers. As almost all transactions processed online use payment cards through a card scheme, this would provide a universal technique that could be mandated at a national level and expanded amongst responsible retailers.

The prototype builds on existing practice from the UK gambling industry, where credit cards cannot be used for gambling transactions in addition to soft blocks on particular types of payments with pre-paid debit cards.

Conclusions

The MCC code system proposed in this report would provide a passive, low friction technique for retailers to ensure their compliance with age restrictions across a wide range of products. By using a single system reliant on already verified card holder data, the current banking system could be used as a baseline mechanism to improve age assurance for online transactions.

Benefits

There are several benefits of the outlined system, each of which are described below.

Legislative compliance

The first and most important benefit of the proposed system is its ability to increase compliance with age restriction laws. There are many disparate legislative Acts in the UK which define a variety of different purchase age restrictions, currently ranging from 12+ to 18+. For online retailers, demonstrating that all sales have been age assured is a challenging process, with an evolving landscape in terms of federated systems and documented standards. Implementing one system across card schemes and retailers would provide a baseline standard, ensuring that all appropriate transactions could be age restricted by default. By using the payments system, retailers can obtain age assurance for the customer with a high confidence from an existing highly accurate data source.

Passive age assurance

Many age assurance techniques increase customer friction by requiring the production or sending of ID, submission of selfies or additional personally identifiable data. MCC codes provide a passive mechanism, reducing the amount of effort required by customers of sufficient age whilst preventing sales to those underage.

Closing the loop

One of the key challenges with the current Licensing Act is the ambiguity between age assurance on order or on delivery. Many retailers already check ID of the receiver, however MCC codes provide a convenient mechanism to close the loop and additionally verify the age of the purchaser. This would help to reduce the vague nature and implementation of online age verification, increasing retailer compliance.

Privacy preserving

A key concern for many online customers will be the use and storage of their personally identifiable data. By using existing payment mechanisms, data sharing can be reduced with no additional personal information required from the customer. In addition, age assurance is provided in a yes/no format, with no exchange of actual age/date of birth or the products being purchased, reducing the amount of private data being shared between systems. This is a key principle of upcoming legislation such as the proposed Age Assurance (Minimum Standards) Bill (41).

Consistent with Age Appropriate Design Code

The ICO's Age Appropriate Design Code defines key principles for systems which may be accessed by children, including maintaining a high level of privacy and clearly communicating age restriction decisions. The proposed system is robust whilst complying with this code, as no additional data is exchanged between the retailer and banks. As a largely transparent system, individual retailers would be responsible for clear messaging when transactions are declined due to age restrictions.

Federated approach

As the online age assurance landscape matures, there is a strong proposition for combining age assurance systems to produce increased confidence in results. This would help develop checks that can use multiple data sources, with the MCC code approach forming a baseline for additional active and passive age assurance techniques. Retailers would be able to access the proposed system with a low barrier to entry, adding more sophisticated techniques for those unable to use the standard payment systems.

An additional benefit for retailers applying a federated approach is the outsourcing of age assurance to a third party. By relying on already held information from an authoritative source, the risk to individual retailers is reduced in addition to minimising the costs of compliance.

Meets industry standards

The provision of a baseline age assurance system using MCC codes would meet industry standards such as PAS1296, the proposed Age Assurance (Minimum Standards) Bill and potential future developments by following standardised principles with minimised data exchange.

Implementation

Even though online age restricted sales are often not monitored or tested by the licencing authorities (6), they pose an increasing challenge for retailers to comply with relevant legislation whilst continuing to meet consumer demand.

Given the clear benefits of the proposed system for retailers demonstrating their compliance with the relevant legislation, an initial voluntary pilot between a major bank and retailers would demonstrate the viability of the approach. This could be expanded into a further voluntary scheme for larger retailers in a similar manner to Challenge 25 for physical sales, with the additional layer of age assurance providing confidence in online sales.

As a final stage, legislative action could be taken in line with the Gambling Commission's ban on the use of credit cards for most gambling transactions. Whilst a full evaluation of the scheme is not yet possible, initial results suggest that limiting certain transactions using MCC codes has been largely successful (42). Replicating and extending this approach within banking systems would provide an efficient means to implement wider restrictions to reduce harm to those underage.

Summary

Overall, the system proposed in this report would offer a standardised baseline approach for all online retailers, incorporating an authoritative data source in the form of already validated banking data. Building on this highly regulated industry provides an approach to increase compliance for sales of many age restricted products, including alcohol, reducing the chance of those underage making inappropriate purchases whilst decreasing risks to e-commerce retailers.

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Appendix 1

Summary of Age Assurance Legislation

The table below shows a summary of the legislation related to the online sale of age restricted products in the UK.

Legislation	Related products or services	Age verification
Consumer Credit Act 1974	Payments by credit card	18+
Video Recordings Act 1984	Video recordings (DVDs)	As labelled
National Lottery etc. Act 1993 (as amended 2021)	Lottery tickets and scratch cards	18+
Anti-social Behaviour Act 2003	Aerosol paints	16+
Licensing Act 2003 (England and Wales) Licensing (Scotland) Act 2005	Alcohol	18+
Gambling Act 2005 (as amended)	Betting	18+
Violent Crime Reduction Act 2006	Knives	18+
Children and Young Persons (Sale of Tobacco etc.) Order 2007	Cigarettes (Tobacco)	18+
Audiovisual Media Services Regulations 2009 (as amended)	Online and on-demand videos	18+
Video Recordings (Labelling) Regulations 2012, 2020	Video recordings (DVDs)	As labelled
Digital Economy Act 2010, 2017	Online content	18+
Nicotine Inhaling Products (Age of Sale and Proxy Purchasing) Regulations 2015	E-cigarettes	18+
Pyrotechnic Articles (Safety) Regulations 2015	Fireworks	12/16/18+
Psychoactive Substances Act 2016	Solvents, aerosols, anti-freeze, nail varnish, nitrous oxide	None, based on intent
Age Appropriate Design Code 2019	All commercial online services that may be accessed by children	—
Age Assurance (Minimum Standards) Bill 2021	All age restricted products sold online	—
Online Harms Bill 2021	All online services	—

Table 5: Summary of UK age assurance legislation.

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