Digital Age Assurance Portfolio
Age Verification for Retail

Fujitsu's Digital Age Assurance solutions address the growing need for trusted digital assurance when evaluating eligibility for age restricted products and services.

Within the portfolio, Fujitsu provide two core solutions, Age Estimation and Age Verification, both of which can be tailored depending on a retailers feature preferences.

Fujitsu's Age Verification Solution

Age Verification is a combination of:

- **Age Verification SDK:** a software development kit (SDK) to be embedded within a customer's mobile application

- **Age Verification QR Validation Service:** a Microsoft Windows deployed component to be hosted on an edge device (e.g., a self-checkout) or as part of an online system, used to validate a Digital Proof of Age certificate for a customer.

Age Verification can run independently or in conjunction with Fujitsu's Age Estimation solution.
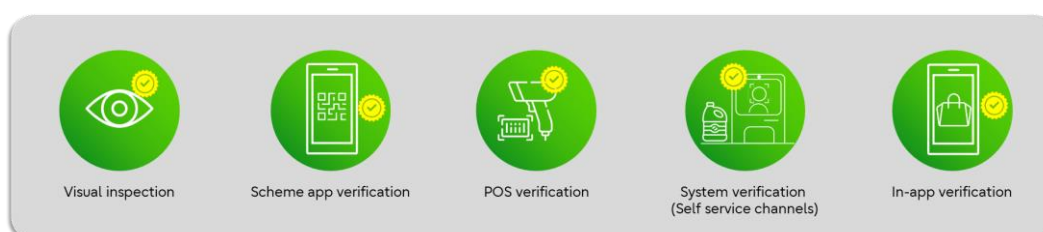
The SDK is built natively for iOS and Android, providing the same functionality on both platforms.   It is designed for simplicity of integration with a comprehensive SDK technical specification, listing all set-up and configuration parameters.

Age Verification for Retail

Fujitsu's Age Verification for Retail solution is designed for the retail environment.   The SDK approach allows a retailer to control the overall customer journey within the confines of their application, without the need to call-out to an external service provider.

The Microsoft Windows based component is optional, but Fujitsu's Age Verification solution can be deployed independently on the self-checkout operating system.

Fujitsu's Age Verification solution allows a customer's age to be verified using multiple methods:

> ### Age Verification Solution
>
> **Seamless Customer Experience:** Maintain full control over the customer's journey and brand experience - with no unwanted third-party apps or services
>
> **Privacy by Design:** GDPR compliant and PII data is held on the customer device - no data ever leaves the device
>
> **Online and Offline Operations:** In addition to online services, Age Verification is also designed to operate offline – allowing it to work seamlessly in any environment.

Visual inspection   Scheme app verification   POS verification   System verification (Self service channels)   In-app verification

Technical Overview

Overview	Fujitsu's Age Verification solution gives retailers the ability to simply, securely, and quickly determines age entitlement of their customers, all within their existing mobile experience. The SDK enables age verification as a feature of a retailer's current application, meaning customers are not forced to download any third-party software or pass their personal details to an unknown service provider. The SDK can be used for pay-in-aisle scenarios or in conjunction with the QR Validation Service. Fujitsu's Age Verification solution can verify a customer's age entitlement completely offline in both SDK only and SDK plus POS / SCO modes meaning there is never a risk to sales due to poor connectivity or complex networking requirements.
Service Description	**Standard** Standard integration and configuration support for customers is included within the customer support agreement. **Optional** Enhanced configuration and support are available, as required, for additional services
Service Options	The following service options are available. • Enhanced support level beyond the standard SLAs • Enhanced configuration support beyond the standard Age Verification for Retail offering
Additional services	The following products might be delivered as part of a wider service or in support of this product: • 3rd party ID validator services for image-based processing e.g., Driver's License • Loyalty card and additional information exchange • Custom branding (beyond standard configuration) • PASS (Proof of Age Standards) Scheme certification • POS / SCO front-end to Windows-based application • Mobile validator application for use by a retail assistant • Assisted registration for accessibility or no ID available • Log capture and reporting as a service
Deliverables	Fujitsu will provide the following deliverables. • Developer SDK and integration guide • Standard configuration and integration package

	• Standard support
Conditions and Exceptions	The retailer is responsible for providing the following services (unless contracted via another service).
	• Application development access
	• POS / SCO software team access
	• Sandbox or development environment
	The service assumes.
	• A retailer mobile application is available that can include the SDK
	• A POS / SCO that is configurable to integrate a Windows-based component
	Prior to this service commencing, each customer must complete the corresponding on-boarding offering to ensure that the service is ready for support.

Age Verification in Practice

The Age Verification SDK is embedded within a retailer's own mobile application(s).   This allows a retailer to own the full customer journey throughout the store experience, with the SDK enabling the proof of age feature.   The method to trigger proof of age can be done in several ways:

- Triggered by an API call from the retailer application (e.g., in-aisle verification)
- Triggered by an application deep link from the challenge QR code, when viewed by a customer's camera on their mobile phone
- Triggered by a customer from the retailer application prior to scanning the challenge QR code

Where a challenge QR code is used for Fujitsu's Age Verification, there are two main use cases:

- Static QR code – This is a printed QR code, affixed to a checkout
- Dynamic QR code – This is a QR code, generated on demand by the Windows QR Validation Service, or a service built by the retailer or checkout software operator.

Both methods will allow for validation of the response QR that will replay details taken from the challenge QR code.

For visual only inspection there is an option to generate the Digital Proof of Age certificate manually via the retailer application, but this negates some security features and would not pass electronic validation.   The retail can create as many or as few challenge QR codes as they wish.   These QR codes are encoded and encrypted (RSA 2048) to prevent misuse.

When the challenge QR code is scanned using the customer's phone, the customer is challenged to biometrically verify themselves by presenting their face to the front-facing camera on their phone.

On successful verification, a human readable Digital Proof of Age certificate is produced with a machine readable dynamic QR code.   Both the human and machine-readable information replay key details and the timestamp from the challenge QR code.   This gives the retailer added reassurance that the certificate is genuine.   For additional confidence, or in an unmanned scenarios such as a SCO environment, the Age Verification QR Validation Service can read and validate the dynamic QR code from the customer's phone.

Solution Context Diagram

The diagram below shows both the SDK component and QR Validation component.

The QR Validation Service can be omitted if visual inspection of the Age Verification QR code is the only method of verification being employed.

When self-checkout or point of sale validation is required, the QR Validation Service decrypts the QR code generated by the SDK and verifies the attributes such as the timestamp, store ID and sub-location in store. The encryption key is private, so de-encrypting the QR code and checking the QR values proves that it is genuine.   This gives a retailer confidence that the QR has not been falsified in anyway and allows for a fully self-service model. A retailer hand-held validator application is an optional add-on so the same validation can occur without the need for SCO / POS integration.

Fujitsu's Age Verification solution can be used in conjunction with Fujitsu's Age Estimation solution, to provide a complete verification suite, or on its own.

The optional services such as mobile validator and logging as a service are not shown in the diagram below.
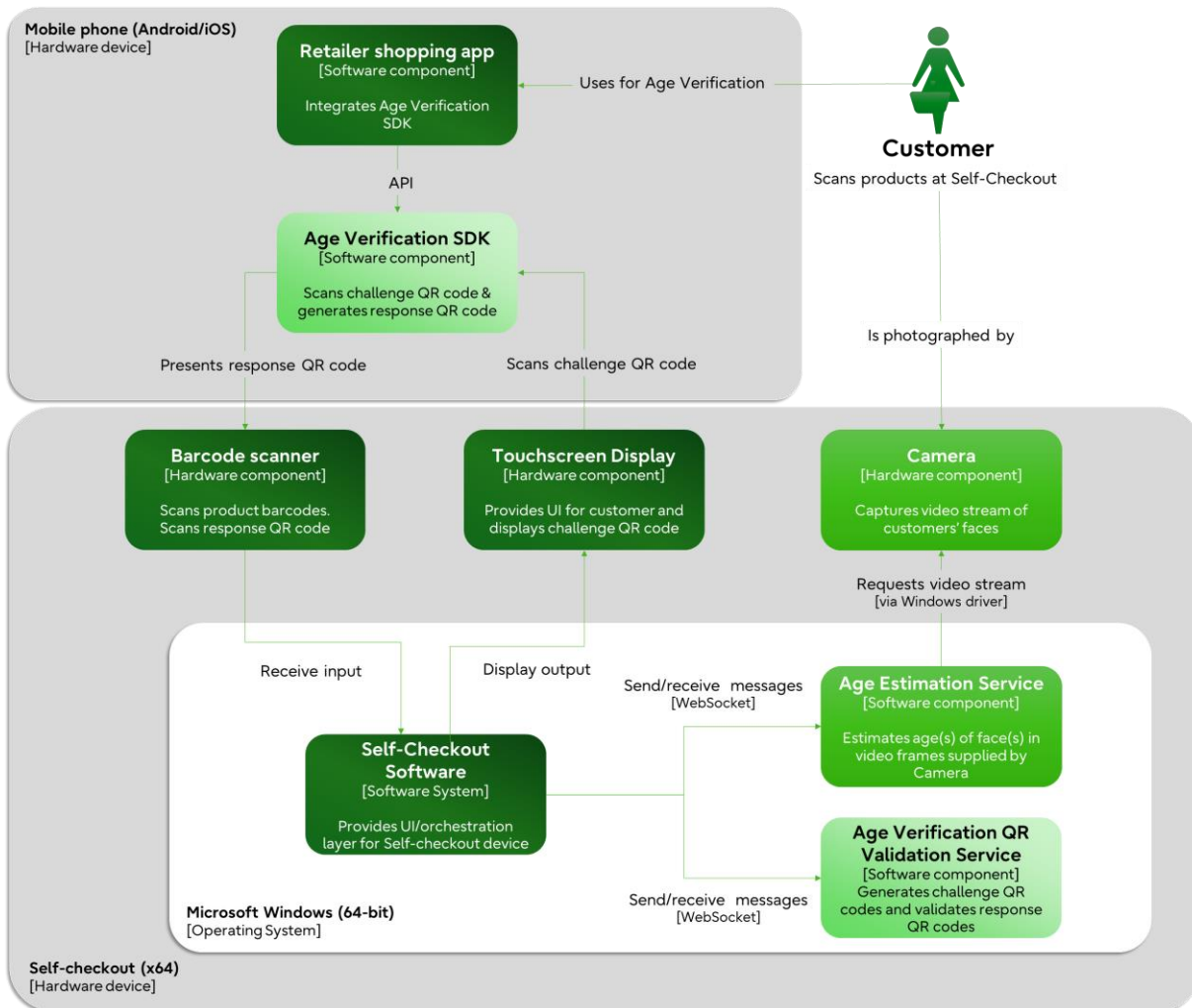
Solution details

Fujitsu's Age Verification SDK Features

The SDK comes in two versions, both written natively, for Android and iOS.   It is developed so no Personal Identifiable Information ever leaves the customer's device with all customer's PII (Personal Identifiable Information) details being fully encrypted and secured within the SDK and host application enclave. Fujitsu never has any knowledge of the customer's activity or details when the SDK is used within a retailer's customer application.

The SDK is designed to verify a customer without the need for network connectivity.   Connectivity is required briefly for registration to access a secure source of date and time, independent of the customer's phone, to prevent spoofing the date on the device.   When using standard electronic identification, such as biometric passports or national ID cards, no information is transmitted to an external service with all ID and biometric verification taking place on a customer's device. To read the chip from the ID, the customer's device must be NFC (Near Field Communications) enabled.

Fujitsu's Age Verification Validation Service

The Age Verification Validation solution is produced to work with edge-devices (e.g., POS or SCO) to verify the QR code which has been generated by the SDK and is displayed on the customer's phone.   The dynamic QR is designed to replay data from the challenge QR code presented at the POS / SCO.

POS verification

System verification
(Self service channels)

This includes data such as the retailer ID, location, and sub-location. It also includes the timestamp the response QR was produced.

The QR Validation Service is called via a WebSocket API and utilizes the POS / SCO barcode reader for relaying the Age Verification response QR code to the QR Validation Service.   Details are included in the Age Verification Validation Service API specification. The Validation information stays within the POS / SCO.

The POS / SCO operating system owner is responsible for integrating the Validation Service API as well as changes to the User Interface. An optional component from Fujitsu can be supplied with a standalone UI component to minimize the POS / SCO customization, if required. This will be subject to agreement of appropriate API calls and features for each POS / SCO software provider.
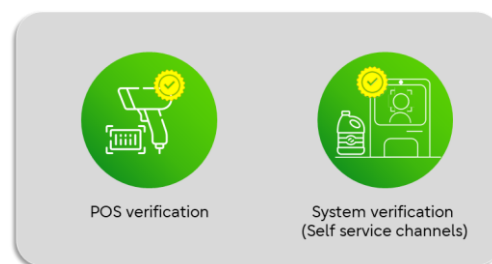
Additional Services

The following briefly describes the additional services and why they may be requested.

Additional ID Types

The SDK is built to read and validate electronic identification from within the SDK. Where a retailer wishes to extend this to include other ID types e.g., driver's licenses, then an additional SaaS service would need to be procured and tested.

Loyalty Card / Additional Information Exchange

The SDK and QR structure allow for retailer defined information such as loyalty card data to be exchanged between the response QR code and the Windows Validator application. This means that a single QR exchange can be used to pass information, that may have also been used at payment, via a QR or barcode.

Custom Branding and User Interface

The SDK is built to accept a retailer's logos and some styling. Where this is insufficient for a retailer's brand standards then the SDK can be customised to accommodate any changes.

Proof of Age Standards PASS

A retailer may wish to become a PASS issuer or acceptor. To do so, the QR and information exchange must also comply with PASS interoperability standards. These standards may impact branding and information exchange and such requirements will be worked through with Fujitsu.

Standalone Self-Checkout / Point of Sale Validator

Fujitsu can provide directly, or via SCO / POS software provider, the application logic and integration to produce dynamic challenge QR codes as well as validating the response QR codes from the SDK. Where integration with the SCO / POS user interface is either too difficult or not wanted then Fujitsu can provide a standalone web-client that can integrate to the Windows based validator software and minimise SCO / POS integration.

Mobile Validator Application

Not all retailers will use sophisticated SCO / POS software but can still benefit from electronic verification of response certificates generated from the SDK. The use of a standalone mobile application for validation can be provided by Fujitsu. This may be used for scenarios such as proof of age checks at the door, rather than just for age-restricted purchases. The mobile validator application contains the same logic as the SCO / POS Windows validator software and will also work offline.

Assisted Registration

Digital age verification can unintentionally introduce barriers through lack of technical proficiency of the customer, disabilities, or lack of acceptable identification. To overcome such exclusions, Fujitsu has developed an assisted registration capability that allows customers with any barriers to adoption to be helped to register by a member of staff.   The SDK itself is built to be as inclusive as possible and works with screen reader technology and has multi-lingual support built in.

Logging as a Service

The SDK can log all events, such as successful age verification events, and include details such as the location and sub-location used. Where a retailer would rather the logs be offloaded to a managed service with pre-defined reporting, then Fujitsu is able to offer this. Otherwise, Fujitsu will work with the retailer to configure the logging options and offloading requirements as part of the onboarding process.

Installation Requirements

The following are the suggested system specifications for Fujitsu's Age Verification solution. Other deployment configurations may be supported but require a bespoke support agreement.

Retailer Requirements	
Operating System POS / SCO	Windows 8.1 (64 bit) or later. 4GB RAM.
Customer Requirements	
Android	Android 9 or higher (100MB SDK size)
iOS	iOS 14.3 or higher (65MB SDK size)
Customer handset	Customer's handsets must support NFC and have both front and rear facing cameras. A full list of tested and supported handsets is available on request as these change over time.

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