ToBe

ABIS SOLUTION

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Toppan Gravity is a subsidiary of Toppan Leefung, serving as the international development arm of the Toppan Group in the security domain. Being part of the most prestigious conglomerate in the industry with decades of experience and multiple well-known references, Toppan Gravity benefits from Toppan Printing's strong market position and extensive expertise.

As a global solutions provider primarily focused on the payment and Identity industries, Toppan Gravity aims at developing the next generation of virtual and physical security documents.

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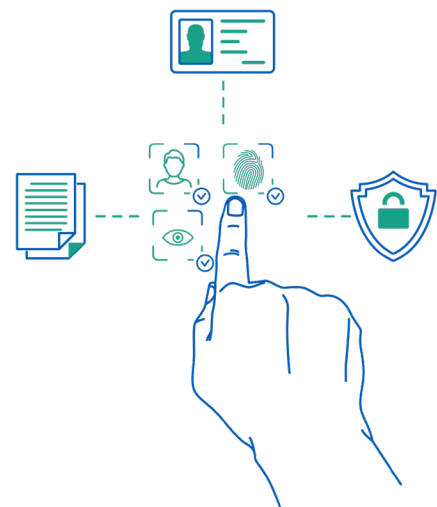
KEEPING YOUR IDENTITY SECURE

Toppan Gravity has many years of experience implementing and operating a multi-modal automated biometric identification system (ABIS), including facial, Iris, and fingerprint identification having deployed it at multiple sites.

With an automated biometric identification system, it is ensured that no applicant will be registered twice. With the support of the biometric database, the system can identify individuals based on their facial features, iris, and fingerprints as part of its identification process.

HONING THE FINE ART OF **ACCURATE IDENTIFICATION**

Based on these experiences, we have designed and built an ABIS that can be customized and be integrated into your existing solutions.

An integrated ABIS lowers the development costs as well as the time and effort required to build the system. In addition, standard hardware is used within the system to reduce maintenance costs.
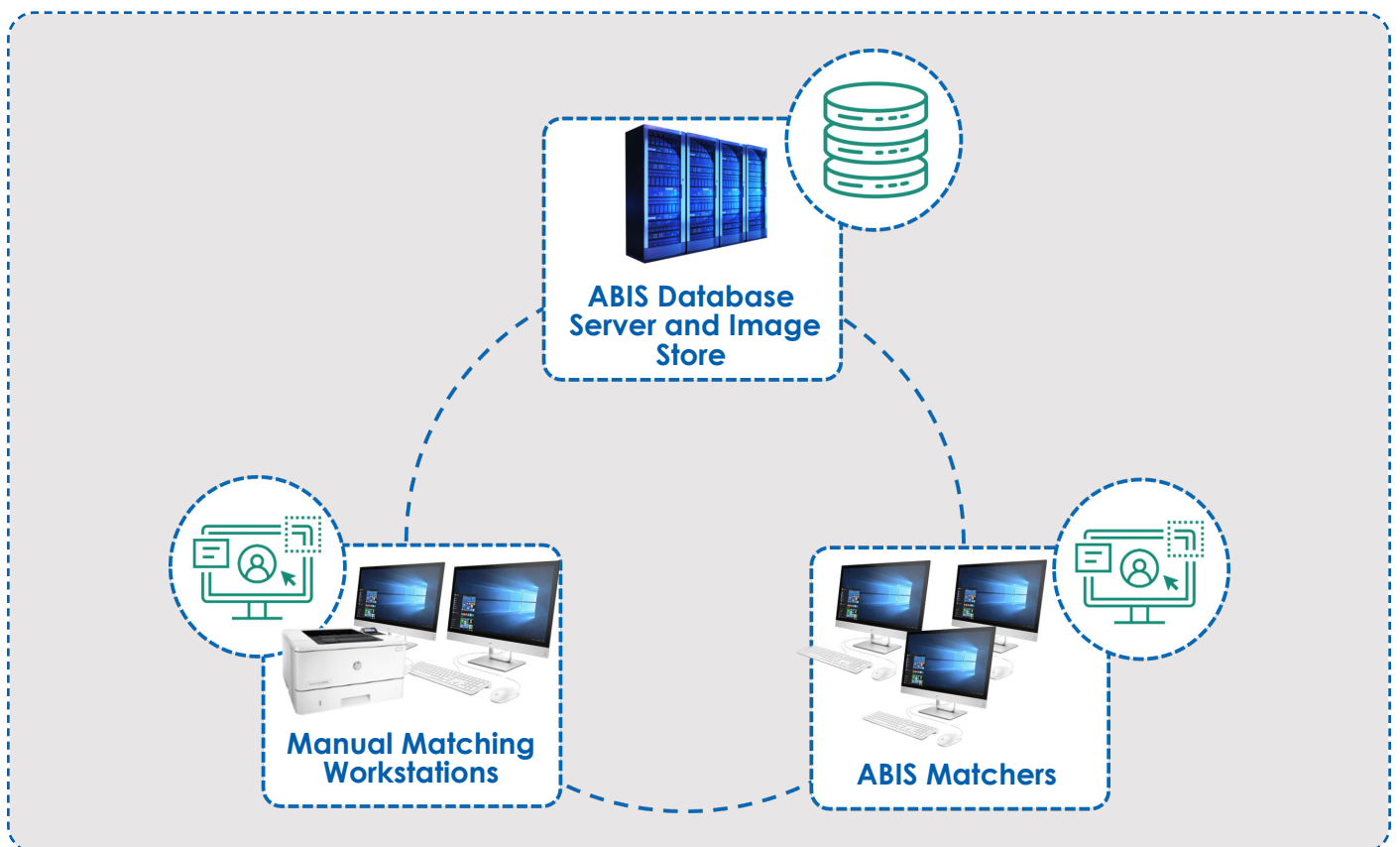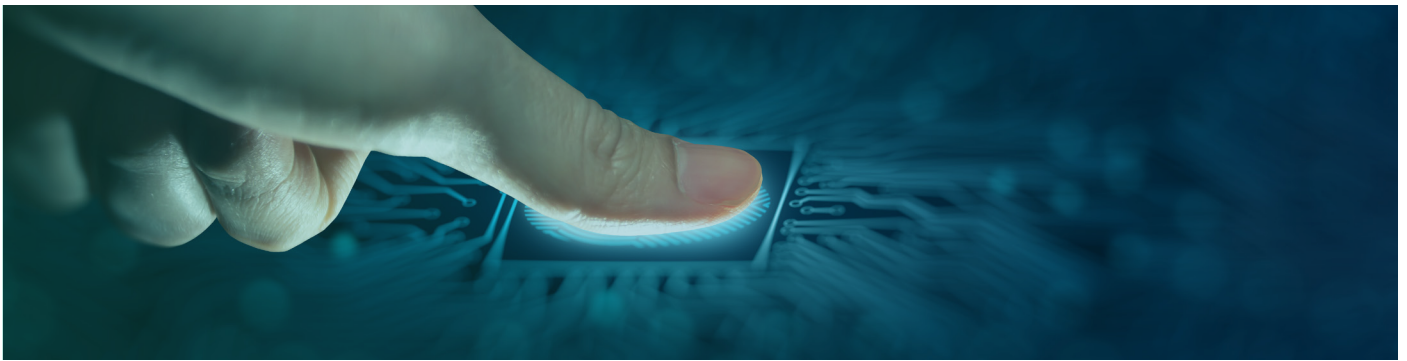
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FASCINATING TECHNOLOGY **AT YOUR FINGERTIPS**

The ABIS package contains everything necessary for setting up complex identification applications, including a high-speed matching engine, biometrics search database management, and client-server architecture. ABIS has a scalable architecture, allowing the matching server component to be installed on several matching computers to distribute the workload and increase matching speed. Therefore, it can search large-scale databases ranging from thousands to millions of biometric modalities.

ABIS **SOLUTION ARCHITECTURE**

ABIS Database Server and Image Store

Manual Matching Workstations

ABIS Matchers

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ADJUDICATION **WORKSTATIONS**

To minimize the false acceptance rate, finger images with a borderline score are marked for manual matching; a process where a trained individual views the finger images and makes an informed decision.
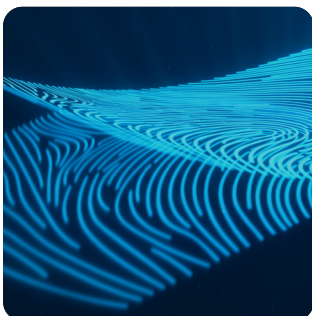
Toppan Gravity offers two methods for handling the identified borderline scores:

MANUAL FINGER VERIFICATION

- Border line fingerprints marked for manual adjudication/matching
- Minimizes risk of false acceptances
- Visual tool displaying fingerprint images with their minutiae points
- Operator/Fingerprint expert analyses/compares similarities using various image manipulation points
- Overlays minutiae points to simplify comparisons
- Operator can mark additional minutia points

MANUAL FINGER-MATCHING USING ADDITIONAL INFORMATION

- Visual tool displaying text and photo of similar fingerprints
- Trained operator/expert compares text and photo
- Visual dashboard showing performance statistics
- Operator can start and stop matcher application
- Various reporting options available

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FINGERPRINT **RECOGNITION ALGORITHM**

ABIS FEATURES:

- (+) Multi modal including Facial, Fingerprint, Iris

- (+) One fused templated containing all 3 modalities

- (+) High-performance Identification and Verification

- (+) High Accuracy

- (+) Scalable

- (+) Works well with low-quality images

- (+) World-leading algorithm

- (+) JPEG, WSQ, and ISO template interoperability

- (+) Implemented successfully in Africa

- (+) High performance on limited bandwidth networks

- (+) 1:1 verification and 1:n identification

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DESIGN PRINCIPLES AND **USE CASES**

DESIGN PRINCIPLES

Multi-Modal Biometric Fusion

Data Security

Biometric Data Quality

Secured Data Storage

Modularity

Support For Multiple Operating Systems

Resident Convenience - Quick Response

Standards Compliance

USE CASES

Civil Identification

National Id Systems

Passport Issuing Systems

Driving License Issuing Systems

Motor Vehicle Registration Systems - Owner Identification

Elections Biometric Voter Registration And Verification

Border Control Systems

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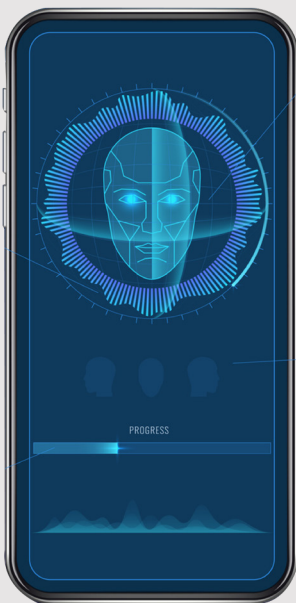TOPPAN GRAVITY

MOBILE **BIOMETRIC AUTHENTICATION**

AI-Powered Engine

Passive Liveness Detection

High Standards for Screening (no masks & hats permitted)

Dynamic Facial Recognition System Using AI Models

Our AI-powered engine supporting both facial recognition and liveness detection is trained and modeled specifically for smartphone use. Both functions are dedicated to the processing of specific face positions and lighting conditions resulting from the use of the front smartphone camera.

Enhanced Image Processing

From images captured by smartphone cameras, our engine performs color correction and gray-scaling on the images before it detects and extracts multidimensional facial features. This improves the quality of the features extracted to evaluate if there is a potential match.

Liveness Detection

Our liveness detection technique extracts numerous environmental features such as light reflections and photograph borders from multiple frames of the image streams and then performs liveness analysis to prevent spoofing attempts such as videos and even silicone masks.

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ABIS PROJECT **REFERENCES**

Country		Projects
	Ethiopia	Taxpayer ID System; ABIS
	India	National Rural Employment Guarantee Scheme; AFIS
	Malawi	Driving Licenses, Motor Vehicle Registration System; AFIS
	Mozambique	Voter registration; AFIS
	Nigeria	Taxpayer ID System; ABIS
	Senegal	Driving Licenses, Motor Vehicle Registration System; ABIS

Country		Projects
	South Africa	Driving License Issuing System FP Verification
	Sri Lanka	Driving Licenses, eMotor Vehicle Registration System; Fingerprint Verification
	Uganda	Driving License Issuing System; ABIS

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