



MÜHLBAUER TECURITY®

GOVERNMENT SOFTWARE SOLUTIONS



CONTENTS

MÜHLBAUER GROUP AT A GLANCE.....4

TECURITY® OVERVIEW6

ENROLLMENT & ISSUANCE

MB GET-ID8

MB GET-ID FORM.....10

MB GOV PORTAL12

MB AMS14

MB QMS16

MB IMAGE ENHANCEMENT.....18

IDENTITY MANAGEMENT

MB DEOS20

MB SDM22

MB TRUST PKI.....24

MB ABIS26

MB TECURE-ID®28

PERSONALIZATION & PRODUCTION MANAGEMENT

MB MES30

MB PALAMAX®32

MB INCAPE34

MB WAREHOUSE.....36

MB DATA PREPARATION38

MB MCES40

MB ID CHIP CODING42

MB APPLETT SUITE.....44

VERIFICATION

MB IDVERSO®46

MB STEEL READER48

MB STEEL READER MOBILE50

GLOSSARY52

NOTES.....54



MÜHLBAUER GROUP AT A GLANCE

MÜHLBAUER’S BUSINESS UNITS AND SITES

Founded in 1981 in the heart of Bavaria, the Mühlbauer Group has ever since grown to a leading global player in the fields of Parts & Systems, Semiconductor Related Products, Document Solutions & Equipment for Security Systems, and innovative Technologies for Electromobility and Flexible Solar Solutions. With around 4,000 employees, technology centers in Germany, Malaysia, Slovakia, the U.S. and Serbia, and 35 sales and service locations worldwide, Mühlbauer created a strong competence network around the globe.

Our global corporation continuously invests in the most modern innovations and creative ideas in order to enhance our competences and to provide you with optimized solutions. We aim to protect the environment with our advanced technologies and make life easier for countless people.

Our in-house precision part production **MPS** – Muehlbauer Parts & Systems – guarantees unlimited flexibility and highest customer satisfaction.

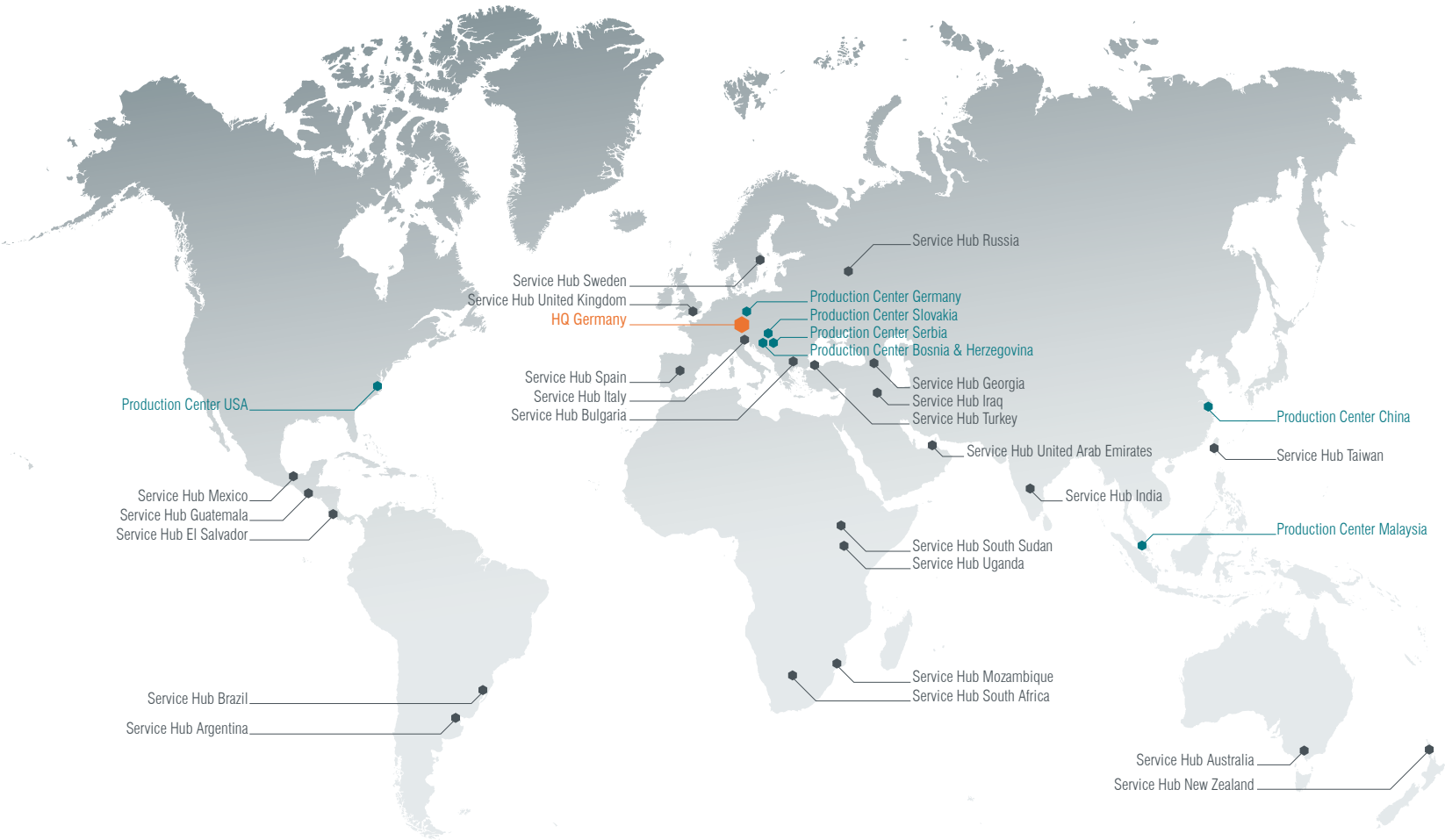
Our business unit **AUTOMATION** does not only develop and assemble individually customized production systems, but also offers intelligent software solutions for production automation

(Industry 4.0). Vision inspection technologies as well as semi-conductor and RFID applications complete our comprehensive portfolio.

Our youngest and currently most dynamic division **ATECH** – **Advanced Energy Technologies** – brings unique machinery requirements to series production. For the eMobility industry, we have been offering highly efficient production lines for the manufacture of pouch- and prismatic cells for lithium-ion batteries, as well as MEA's & stacks for fuel cells since 2022. Another promising area in this business field is our expertise in precise reel to reel material handling, which enables us to provide innovative production concepts for flexible solar cells and panels.

Our business unit **TECURITY®** is established as a competent partner for the implementation of security systems for identifying and verifying both documents and individuals. Our clients benefit from more than three decades experiential value which we have gained during the realization of over 300 ID projects worldwide.

There is no “can’t do” at Muehlbauer. We tailor your solution!





Mühlbauer
Bosnia & Herzegovina



Mühlbauer
China



Mühlbauer
Germany



Mühlbauer
Malaysia



Mühlbauer
Serbia



Mühlbauer
Slovakia



Mühlbauer
USA



MPS
Precision Parts & Surface Engineering



AUTOMATION
Production Equipment & Systems



MB ATECH
Battery & Fuel Cell Technologies



WORLD OF TECURITY®
Government & Technology Solutions



TECURITY® OVERVIEW

YOUR COMPETENT PARTNER FOR GOVERNMENT SOLUTIONS

SPECIALIST FOR ALL PROCESS STEPS – FROM RAW MATERIAL TO COMPLETE SYSTEMS

ENROLLMENT

- Online/Offline
- Web-based
- Image Enhancement
- Mobile/stationary



IDENTITY MANAGEMENT

- Life-Cycle Management
- eGovernment Services
- MB ABIS



PRODUCTION

- Production Management
- Material Management
- Production Monitoring
- PKI
- SmartCard Applets
- Prepersonalization



PERSONALIZATION

- Personalization Management
- Data Management
- Machine Management
- Material Management
- PKI
- Apps



VERIFICATION

- Stationary Document Verification
- Mobile Document Verification
- Quality Assurance



CONCEPTION

- Consulting
- Solution architecture
- Document design



Mühlbauer GET-ID the live data enrollment solution for real-time and applicant-specific data capturing - is designed for comfortable and secure communication between data capturing units and related data management. The applicant's biometric data (e.g. face image, fingerprints, signature or iris) are directly enrolled on site. Demographic data (e.g. name, address or date of birth) can either be pre-fetched from the civil register or be determined via live enrollment. MB GET-ID is based on state-of-the-art algorithms for biometric and demographic data processing and complies with international standards such as ICAO.



FEATURES & ADVANTAGES

- 
 MB GET-ID enables the automatic and manual enhancement of images
 - Correction of image's angle
 - Removal of inappropriate backgrounds
 - Optimization of image's color
 - Embedding of image in various pre-defined backgrounds
 - Final assessment of image according to ICAO standards
- 
 Live-capturing of demographic and biometric data
- 
 Processing of different document applications within one single unit
- 
 Online and offline data processing
- 
 Centralized and decentralized use
- 
 Use on desktop, mobile devices and tablets
- 
 Adaption to any use case
- 
 Easy integration into MB IDENTITY MANAGEMENT



ENROLLMENT
& ISSUANCE

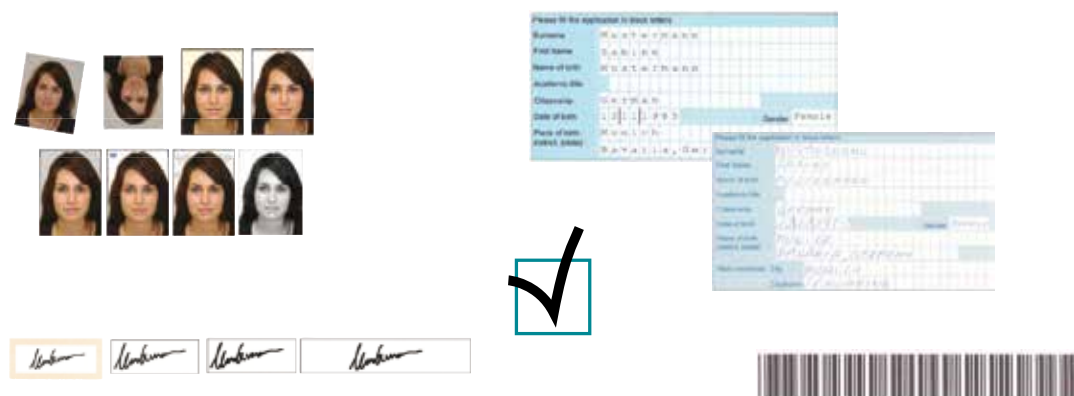
IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



Mühlbauer GET-ID FORM is the most advanced data enrollment package available in the market today. With its incorporated image enhancement, OCR/ICR, barcode recognition, signature enhancement and fingerprint processing, it allows configurations for multiple predefined documents.



FEATURES & ADVANTAGES

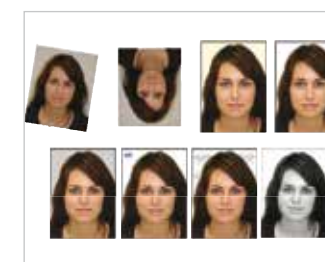
PRIMARY COMPONENTS

- Batch capturing unit
- Import of batch data from a variety of external sources
- Compatibility with various biographic and biometric data sources
- Quality management and manual correction units
- Assurance of compliance with current ICAO standards



PICTURE CORRECTION

- Automatic or manual enhancement of images to meet ICAO standards
- Correction of incoming image's orientation
- Removal of various backgrounds
- Embedding of image in various backgrounds
- Final adjustment of image
- Full configurability of ICAO checker



FEATURES

- OCR/ICR - Machine and hand-written text recognition
- Signature enhancement - extracts, defines and enhances signatures
- Barcode recognition - supports 1D and 2D barcodes
- OCR - reads checks and crosses within predetermined areas
- Fingerprint capturing - can be combined with background removal



ENROLLMENT
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IDENTITY
MANAGEMENT

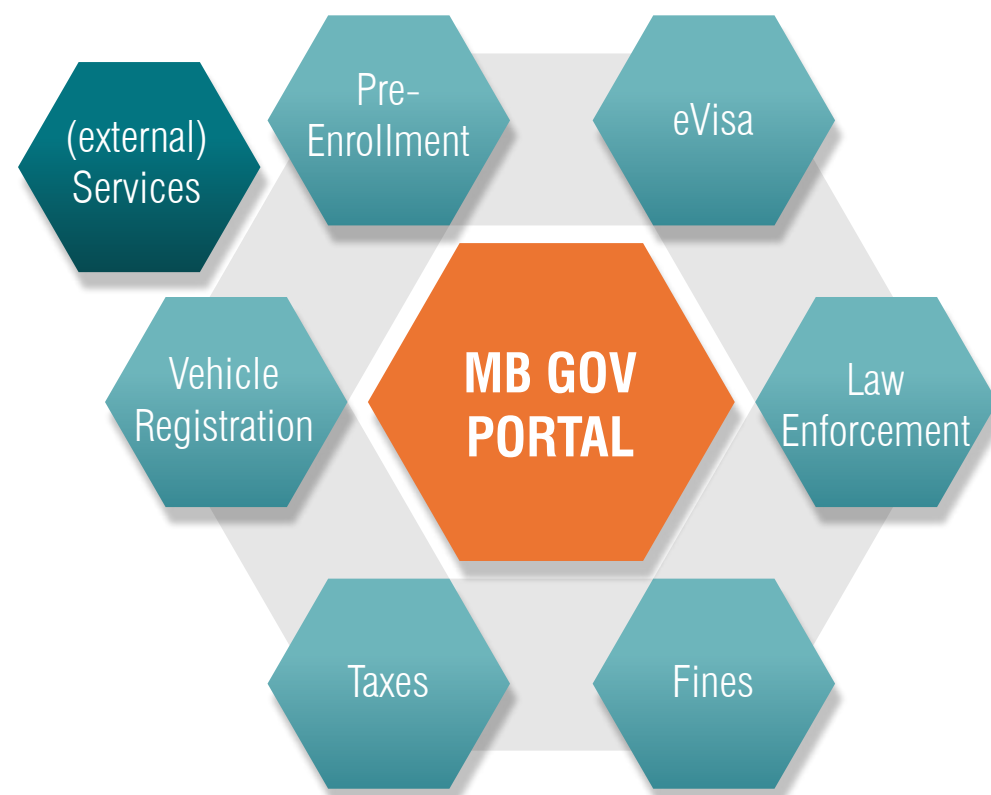
PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB GOV PORTAL is a secure and easy-to-use e-Government website that gives citizens round-the-clock access to digital governmental services. Typical fields of application include online registration (pre-enrollment) for identification document issuance, appointment booking (with MB AMS) as well as requests for eVisa issuance. The platform can also be customized for other services such as tax management, law enforcement, vehicle registration, customs declaration, as well as issuance of health/vaccination certificates, to name but a few.

Based on web technology, MB GOV PORTAL applications are accessible via a web browser on computers or mobile devices.



FEATURES & ADVANTAGES

-  Anytime: 24/7 availability of governmental online services
-  Anywhere: from smartphone, tablet, notebook or desktop PC
-  Efficient handling of application processes for different documents
-  Transparency of administrative procedures for registered users:
 - Application status
 - Issued documents
 - Notifications and reminders
-  Appointment booking for procedures that require a visit to an office (via MB AMS)
-  Online processing of payment transactions, payment receipt verification
-  Platform for posting relevant news and information for citizens and applicants
-  Seamless digital experience
-  Secure communication between web browser and background system
-  Client-side authentication for registered users
-  Supported web browsers: Chrome, Edge, Firefox, Safari
-  Supported operating systems: Windows, Linux, macOS, Android, iOS

ENROLLMENT
& ISSUANCE

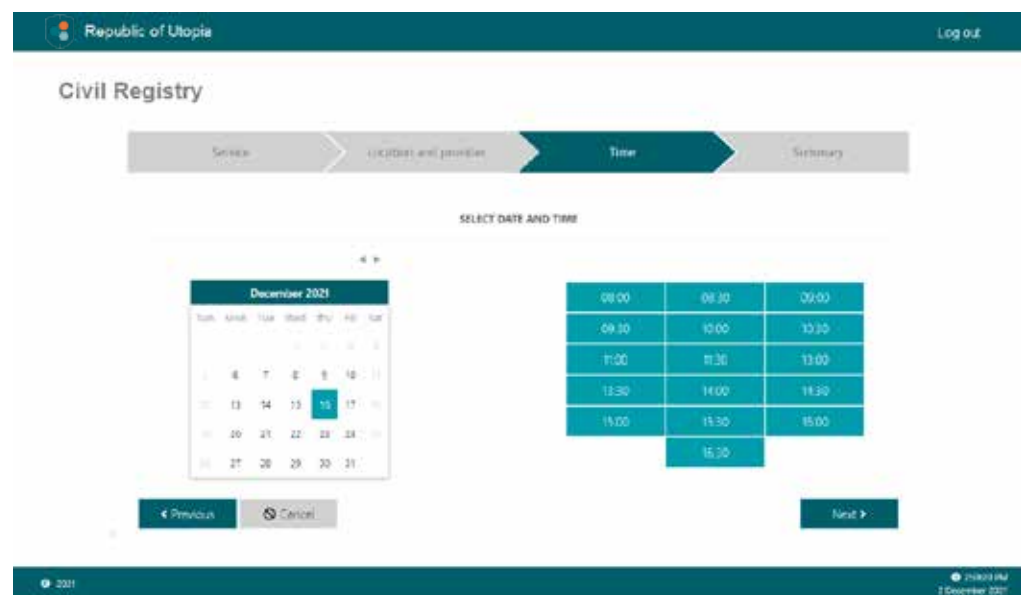
IDENTITY
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PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB AMS improves the organization and control of appointments at governmental offices. Citizens, on the one hand, can schedule appointments via the public Appointment Portal, where they also receive instructions regarding procedures or required documents for their appointments. Officers, on the other hand, can manage all the related settings in the AMS Administration Client, for example calendar templates, appointment plans, offices, stations and available services.

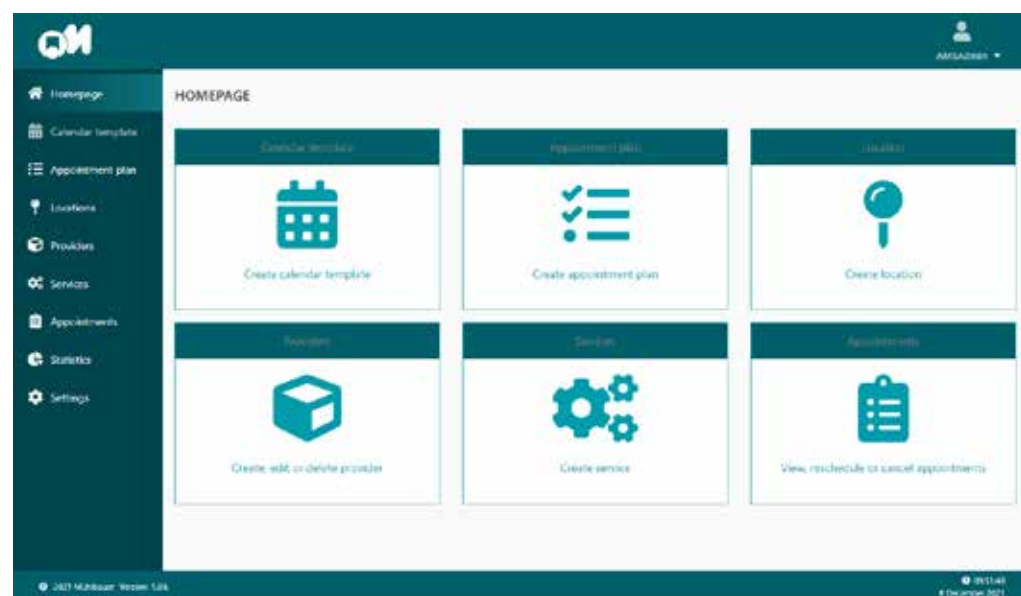


The screenshot shows the 'Civil Registry' section of the Appointment Portal. It features a navigation bar with 'Service', 'Locations and providers', 'Time', and 'Summary'. Below this is a 'SELECT DATE AND TIME' section. On the left, there is a calendar for December 2021 with the 15th highlighted. On the right, there is a table of available time slots:

08:00	09:30	09:00
09:30	10:00	12:30
11:00	11:30	13:00
13:30	14:00	14:30
15:00	15:30	16:00

At the bottom, there are buttons for 'Previous', 'Cancel', and 'Next'.

Exemplary Appointment Portal



The screenshot shows the 'AMS Administration' interface. It has a sidebar with a menu including 'Homepage', 'Calendar template', 'Appointment plan', 'Locations', 'Providers', 'Services', 'Appointments', 'Statistics', and 'Settings'. The main area is titled 'HOMEPAGE' and contains six cards with icons and text:

- Create calendar template** (Calendar icon)
- Create appointment plan** (List icon)
- Create location** (Location pin icon)
- Create, edit or delete provider** (Person icon)
- Create service** (Gears icon)
- View, reschedule or cancel appointments** (Calendar icon)

AMS Administration

FEATURES & ADVANTAGES

-  Online booking of appointments, e.g. for enrollment or issuance
-  Appointment Portal: standalone solution or part of an existing web application
-  Configurable calendar with office hours determines the available timeslots
-  SMS Notifications and reminders of appointments via SMS and e-mail
-  If a calendar is edited, applicants are automatically notified about rescheduled appointments
-  Integrated with MB GOV PORTAL and MB QMS
-  Statistics, e.g. daily appointments per service, per office, missed appointments

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB QMS provides reliable and flexible queue management for your services. Applicants arriving at a governmental office will receive a ticket at the self-service kiosk and then wait until their ticket number is called. There is no need to stand in line, because the sequence is clearly defined.



FEATURES & ADVANTAGES

-  MB iKIOSK Q for service selection and ticket issuance
-  Possibility to play a promotional video while the kiosk is idle
-  Large queue display: called and upcoming tickets, missed calls, news ticker
-  Applicants who scheduled an appointment (e.g. via MB AMS) are automatically queued
-  Priority tickets, e.g. for pregnant women and elderly people (via supervisor assistance)
-  Fairness: enough time for a ticket call, second chance after a missed call, ticket verification
-  QMS Administration Client for managing services, available desks, office hours and timeouts
-  Integration API for ticket calls and ticket verification (integrated with MB GET-ID)

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



QUALITY PORTRAITS FOR IDENTIFICATION DOCUMENTS

The Mühlbauer Image Enhancement SDK is a set of easy-to-use image processing methods for desktop or server software solutions for biometric system developers and integrators. It is aimed at eliminating the most common problems encountered with portrait images captured from various differing sources in the field and ensure a constant quality of captured face images.

Automated image optimization and evaluation can be fairly complex and has to be handled carefully in order to assure that face images are suitable for printing and automated face recognition systems. That is why Mühlbauer is using specialized highly reliable AI methods as the base for our Image Enhancement SDK.



Our technology ensures constant performance and reliability with various state-of-the-art image-processing functions and is highly scalable. The Mühlbauer Image Enhancement SDK can be used in data enrolment directly on the capturing client, but it can also run as a service in the backend systems to prepare previously enrolled images for biometric data verification, identification or printing.

The integration of the Mühlbauer Image Enhancement SDK is straightforward and can be as simple as calling a web service when relying on the preconfigured automatic, but it also allows direct control of the individual processing steps.

FEATURES & ADVANTAGES

- 
FACE FINDING
 Using powerful AI to recognize the face in a captured image & extract it's biometrical landmarks
- 
BACKGROUND REMOVAL / MANIPULATION
 Using powerful AI to separate the face from the background / Option to insert a new background
- 
POSITION CORRECTION
 Rotating & aligning the image horizontally & vertically
- 
IMAGE CROPPING
 Cutting & resizing the image according to defined settings
- 
COLOR CORRECTION
 Adjusting the colour palette & white balance
- 
BRIGHTNESS & CONTRAST ADJUSTMENT
 Adjusting of the image's brightness & contrast
- 
IMAGE CHECK & EVALUATION
 AI supported checks & evaluations of the image quality according to ICAO recommendations
- 
INTUITIVE APPLICATION PROGRAMMING INTERFACE (API)
 Easy to integrate into any software solution

ENROLLMENT & ISSUANCE

IDENTITY MANAGEMENT

PERSONALIZATION & PRODUCTION MANAGEMENT

VERIFICATION

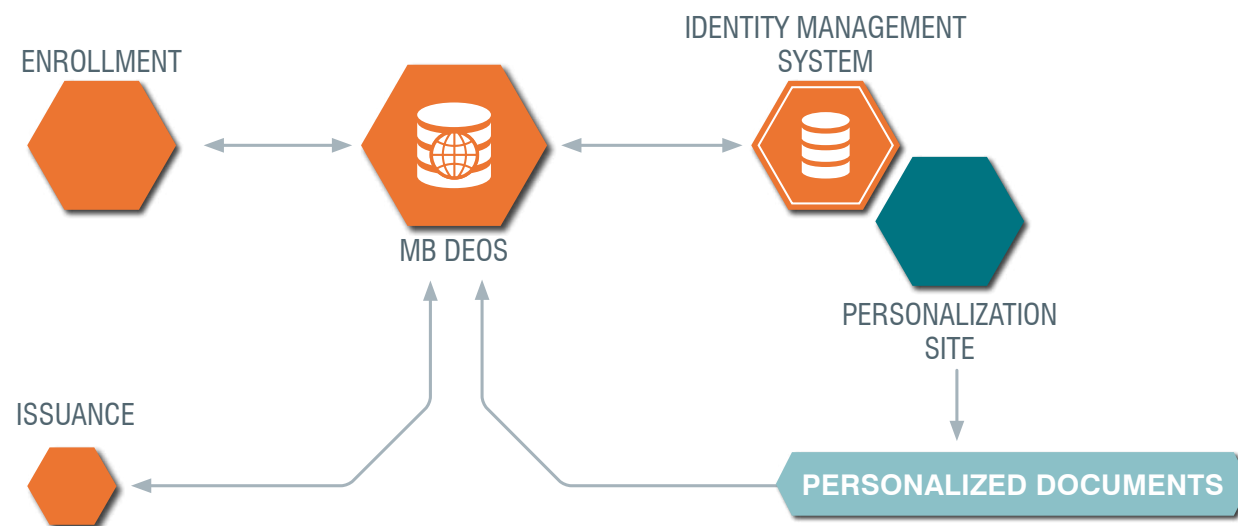


MB DEOS is the ideal solution for a decentralized enrollment and issuance workflow. Installed in a local or regional data center, MB DEOS manages the collection and storage of data from different enrollment stations, ensures data correctness and securely exchanges data with the centralized identity management system.

MB DEOS also tracks the personalized documents before their issuance to the applicants. In addition, it can serve for managing various deliverables such as payment receipts or for managing cash flows in an enrollment site.

FEATURES & ADVANTAGES

-  Management and storage of data received from connected enrollment systems
-  Communication between enrollment systems and identity management system
-  Secure communication via integrated MB USER MANAGEMENT
-  Communication via web service, e-mail or storage media
-  Can serve as a local register of applications, documents and persons
-  Java EE architecture is fully scalable according to the customer's requirements



ENROLLMENT
& ISSUANCE

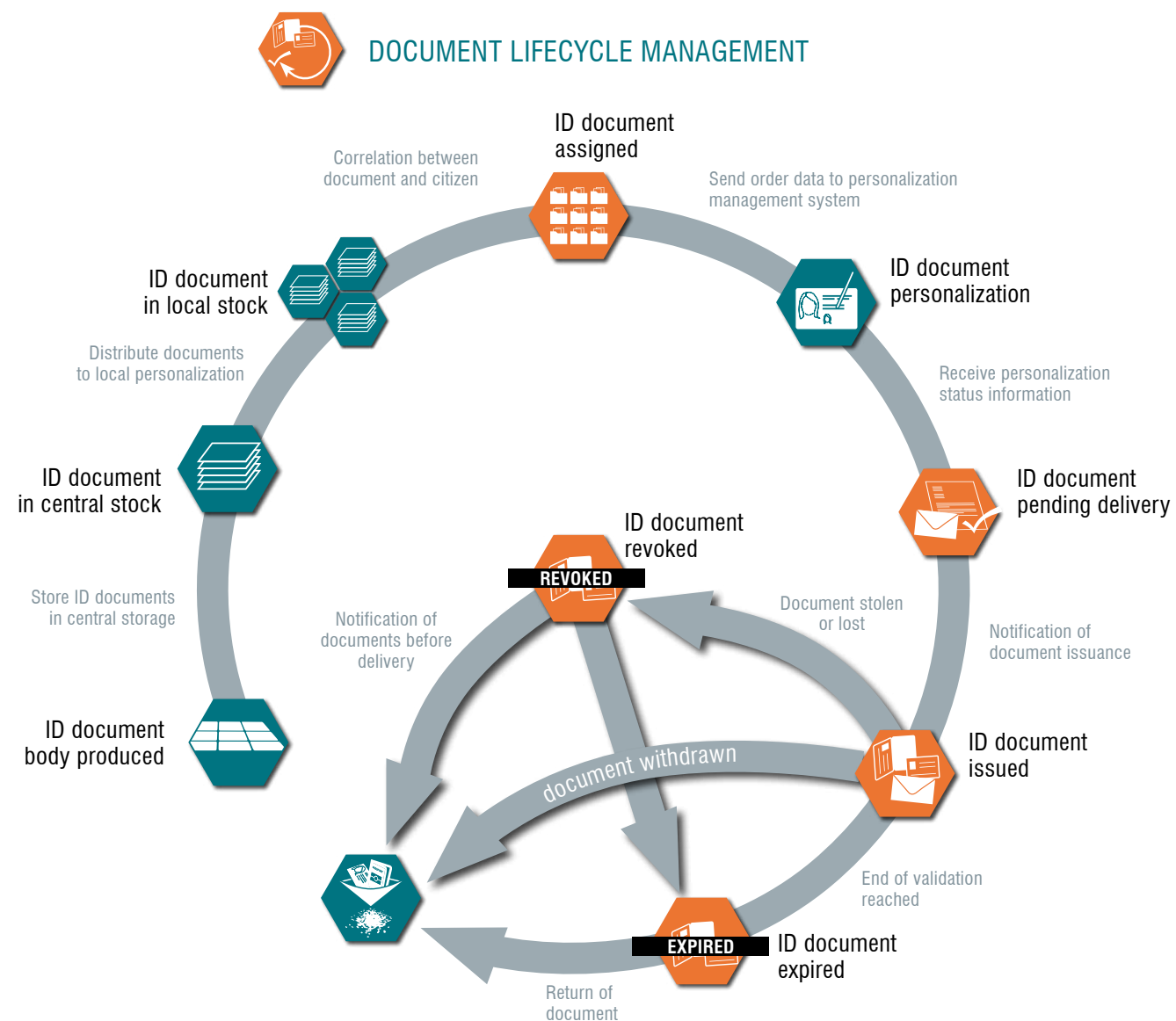
IDENTITY
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PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB SDM stores and allows the management of multiple documents such as National e-ID cards, Driver's Licenses, Vehicle Registration Licenses, e-Visas or e-Health cards at the same time. Starting from the "application for document" phase and ending with document expiry and document destruction, MB SDM assures and manages all life cycle phases of these documents and all applications and persons involved as well as vehicles and other assets.



FEATURES & ADVANTAGES

-  Highly secure management of citizen data and documents
-  Management of multiple types of applications and documents in only ONE system
-  Java EE architecture is fully scalable according to the customer's needs
-  Flawless integration into all Governmental Legacy Systems
-  Complete lifecycle management for required document types and application types
-  Interface to
 - Manage requests from external systems
 - Data capturing systems
 - Automated biometric identification system (ABIS) based on face, fingerprint and/or iris
 - Personalization management systems
-  Automatic registration of alteration of data and data processes
-  Post-issuance process

ENROLLMENT
& ISSUANCE

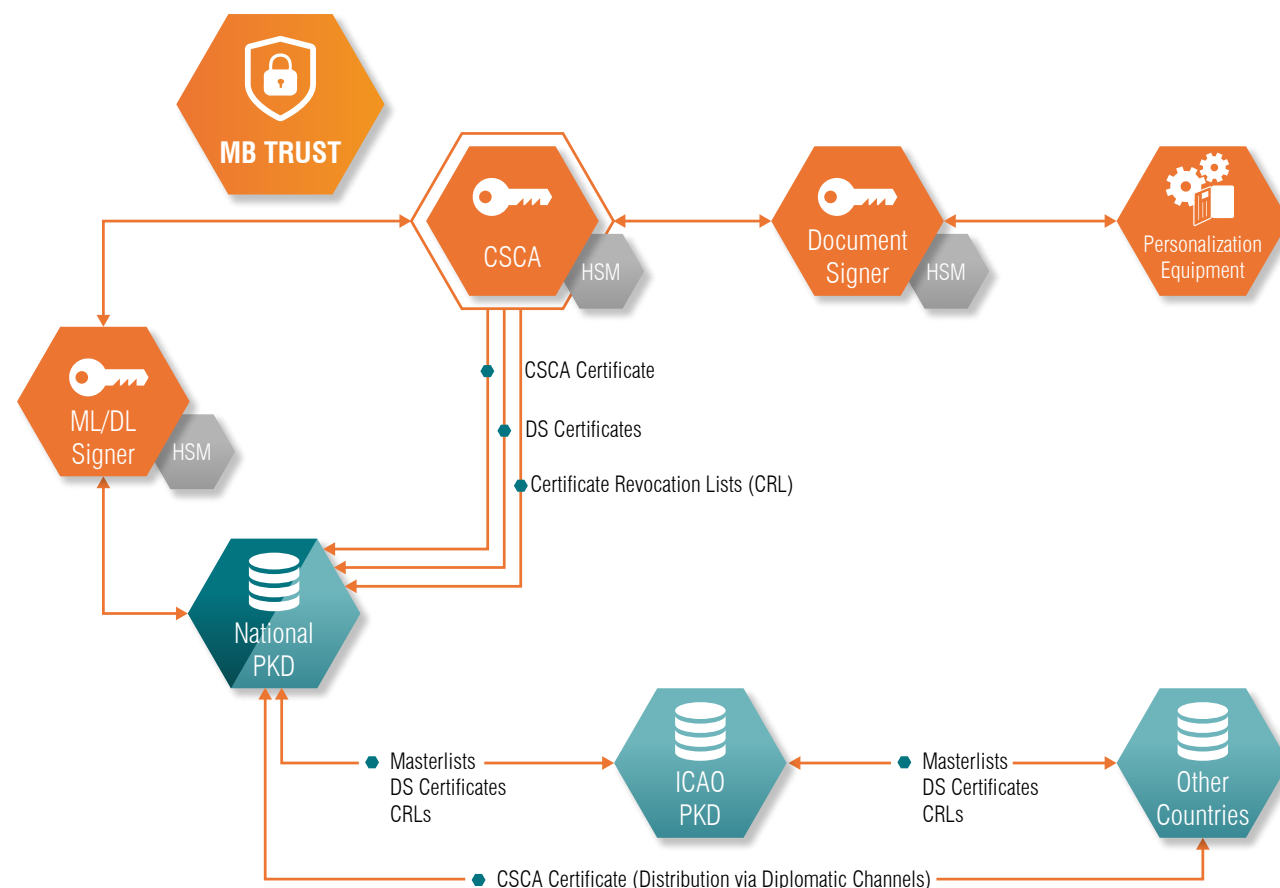
IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



ICAO has elaborated how documents can be securely created and used for reliable identification and secure transmission, handling and storage of personal data including biometrics. MB TRUST PKI follows this ICAO recommendation in order to cryptographically secure the information in documents as well as the trusted identification and verification of such information and of the related documents.



Besides the core products of the MB TRUST product family, Mühlbauer can provide all relevant cryptographic components for issuing and verifying of secure documents like:

- MB TRUST KMS – The Key Management System
- EAC PKI
 - » Country Verification Authority (CVCA)
 - » Document Verification Authority (DVCA)
 - » Document Verification Authority for Quality control systems (QVCA)
 - » Inspection System / Terminal Control Center
 - » Single Point of Contact (SPoC)
- National Public Key Directory (N-PKD)

FEATURES & ADVANTAGES

- PKI** Highly secure ICAO-compliant PKI solution
- CSCA** Nonhierarchical CSCA
- Signature** Digitally signed data by Document Signer
- User** User management with n-factor authentication
- ICAO** Certificate management according to ICAO standard
- HSM** Support of various HSM platforms

COUNTRY SIGNING CERTIFICATE AUTHORITY (CSCA)
Mühlbauer TRUST CSCA is a nonhierarchical root authority and the highest trust point in the country issuing solution for MRTDs:

DOCUMENT SIGNER (DS)
The MB TRUST Document Signer module digitally signs all data stored in MRTDs. It also uses an HSM as protected environment for generation and storing of DS key pair and performs cryptographic function with secure asymmetric keys.

ML/DL SIGNER
A Master List Signer is an optional entity that digitally signs a list of CSCA certificates (domestic and foreign) in support of the bilateral distribution mechanism for CSCA certificates. A Deviation List Signer is an optional entity that digitally signs a Deviation List, which is implemented as a SignedData type, as specified in RFC 3852.

NATIONAL PUBLIC KEY DIRECTORY (PKD)
The main purpose of an optional PKD is to store and provide national access to all public keys and certificates which are cryptographically related to the private keys.

HARDWARE SECURITY MODULE (HSM)
The HSM represents a safe environment for the cryptographic keys which never leave it in unencrypted form.

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB ABIS supports all biometric identification and verification processes, for example automatic face, iris, fingerprint and palm recognition.

FEATURES & ADVANTAGES



Multi-biometric identification possible



Versatile multi-platform products with unique features



Support of AFIS, FRS and IRS



Configurable decision matrix



Supporting solutions from different core suppliers

- Neurotechnology (standard)
- Cognitec
- Innovatrix
- NEC



COMPLIANT WITH INTERNATIONAL STANDARDS AND IMAGE FORMATS

- BioAPI 2.0 (ISO/IEC 19784-1:2006) Framework and Biometric Service Provider (BSP)
- ISO/IEC 19794-2 Information technology – Biometric data interchange formats – Part 2: Fingerprint
- ISO/IEC 19794-4 Information technology – Biometric data interchange formats – Part 4: Finger image
- ISO/IEC 19794-5 / 6 Information technology – Biometric data interchange formats – Face image data
- ANSI/INCITS 378-2004 Finger Minutiae Format for Data Interchange(ANSI378)
- ANSI/INCITS 381-2004 American National Standard for Information Technology – Finger Image-Based
- Image formats: WSQ, NIST (iHead), JPG, JPEG 2000, PNG, TIF

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB TECURE-ID® allows users to identify themselves via mobile devices. It follows international ICAO recommendations. Data Acquisition takes place in advance using a safe and trusted procedure. The data will be stored in a secured data container in the user's mobile device. The system uses a highly secured online connection to access an ABIS and fetch the results. The MB TECURE-ID® App is complementary to physical identification products which can also be utilized as a stand-alone solution.



FEATURES & ADVANTAGES

-  2D barcode signed via PKI (national or local)
-  Support capturing of 2D barcodes
-  Online and offline verification possible
-  Transfer of identity to verification client via secure interface
-  Trusted hardware and infrastructure
-  Interface to Mobile ID Service
-  Support of identity verification via ABIS against data stored
-  Support of age verification
-  Support on major mobile platforms (iOS, Android)
-  Compatibility with MB STEEL READER MOBILE as verification tool (see pages 40/41)



CENTRAL REGISTER

- Database of person-related data
- Trusted hardware and infrastructure



MOBILE ID VERIFIER

- User-friendly mobile application
- Supports use of peripheral devices



MOBILE ID APP

- Verified mobile application
- Personal data, including face image



MOBILE ID SERVICE

- Verification of extracted ID
- Person recognition via MB ABIS with low FAR

ENROLLMENT
& ISSUANCE

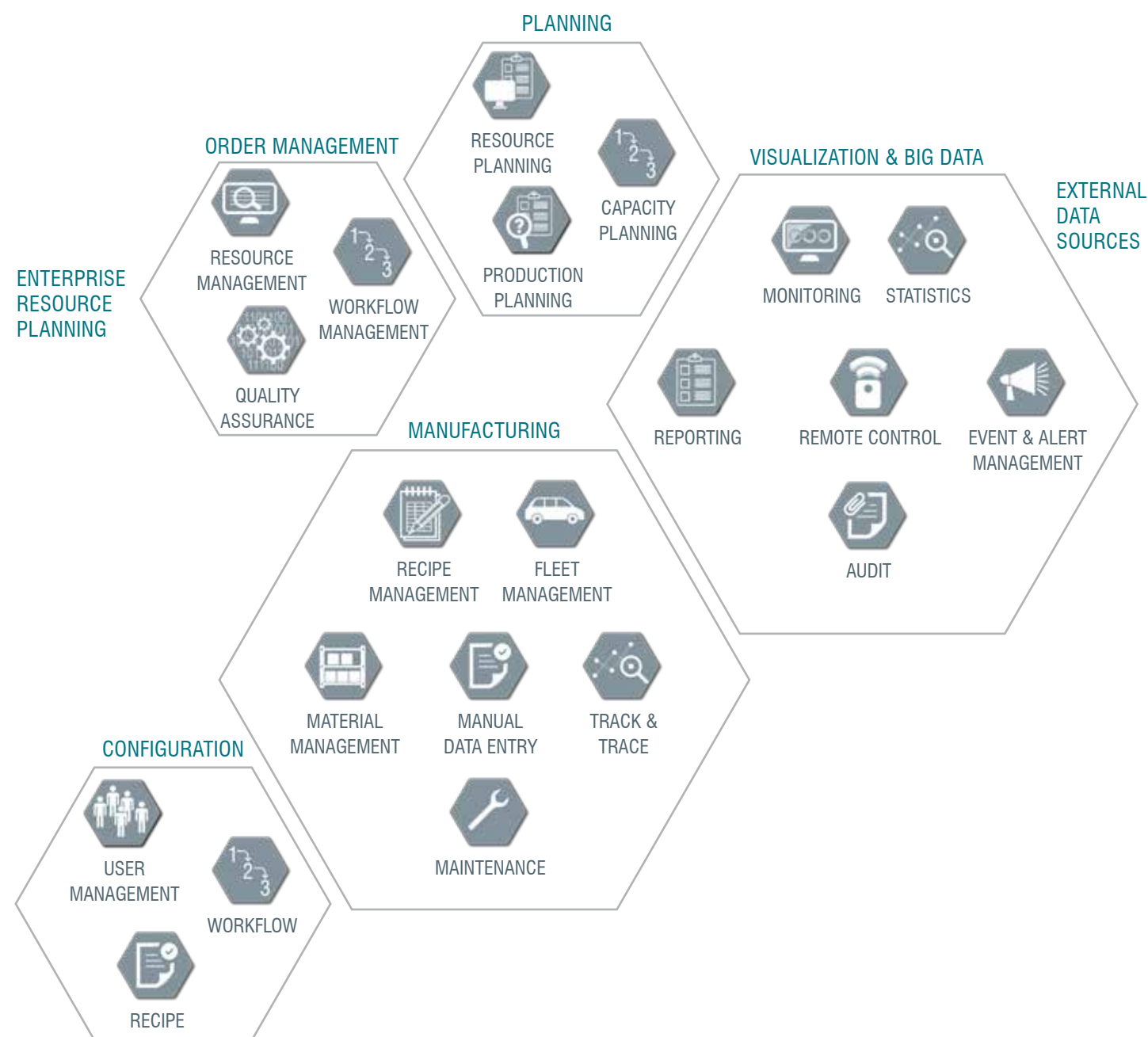
IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



COMPONENTS AND FUNCTIONALITY



AUTOMATED FASTLANE PROCESS

USER MANAGEMENT

- Access rights
- Data Security
- Time tracking

ORDER MANAGEMENT

- Workflow management to define production steps
- Order management to dispatch production steps
- Reporting module reporting to external system

PRODUCTION PLANNING

- Job Generation, assigning machines and resources, sending jobs to MCEs / machine
- Capacity planning (forward and backward) to meet production deadlines
- Downtime monitoring and management alerts when production deadline is affected

RESOURCE PLANNING

- Shift planning including time management and accounting
- Operator planning (including skills)
- Product dictionary with recipes and dictionary for production and material requirements
- Machine dictionary with machine capacities, like UPH

MATERIAL MANAGEMENT

- Warehouse management
- Material reservation, accounting
- Material tracking, inventory

PRODUCTION MONITORING

- Real-time machine & production state visualization
- Production calculation & visualization parameters

CONFIGURATION

- User Management
- Other configurations, like recipes, workflow, etc.

PRODUCTION STATISTICS

- Production Overview based on historical data
- Analysis of production steps and results
- Quality overview

PRODUCTION AUDIT

- User action track and trace
- System action track and trace

TRACK & TRACE

- All production steps, parameters, measurement results for an individual unit are tracked
- Online-SPC Monitoring

REPORTING

- User configurable reports
- Report Generation in various formats

REMOTE CONTROL

- Central machine operation from a central control center

MAINTENANCE

- Planning of scheduled production down times
- Automatic notifications when maintenance tasks are due

EVENT AND ALERT MANAGEMENT

- Instant messaging
- Rules engine and message automation
- Flexible message interface

RECIPE MANAGEMENT

- System to centrally host and distribute machines recipes to other machines
- Target is loading jobs to different machines without readjusting these machines
- Preparing recipes in offline mode

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB PALAMAX®, Mühlbauer's Smart Factory solution, is developed for card, tag or booklet productions, personalization factories and semiconductor backend shop floors. Consisting of an NOSQL database, it is designed to set and collect process data to monitor and improve the efficiency of production and personalization. The collected process data is stored in big data sets for later processing, visualization and statistical analysis.



FEATURES & ADVANTAGES



PALAMAX.MONITOR

Monitors the real-time performance of the production



PALAMAX.STATS

Statistical tool which analyzes collected data and delivers customized statistics on OEE



PALAMAX.REMOTE

Enables the remote operation of machines on the shop floor from a control centre



PALAMAX.TRACE

Allows for the auditing of single manufacturing runs



PALAMAX.MAINTAIN

Enables the implementation of maintenance on demand



PALAMAX.COST

Increases effectiveness and efficiency so that production becomes more profitable



PALAMAX.RECIPE

Enables production engineering to prepare and test a repeatable factory set-up. Factories can switch between products within minutes.

ENROLLMENT
& ISSUANCE

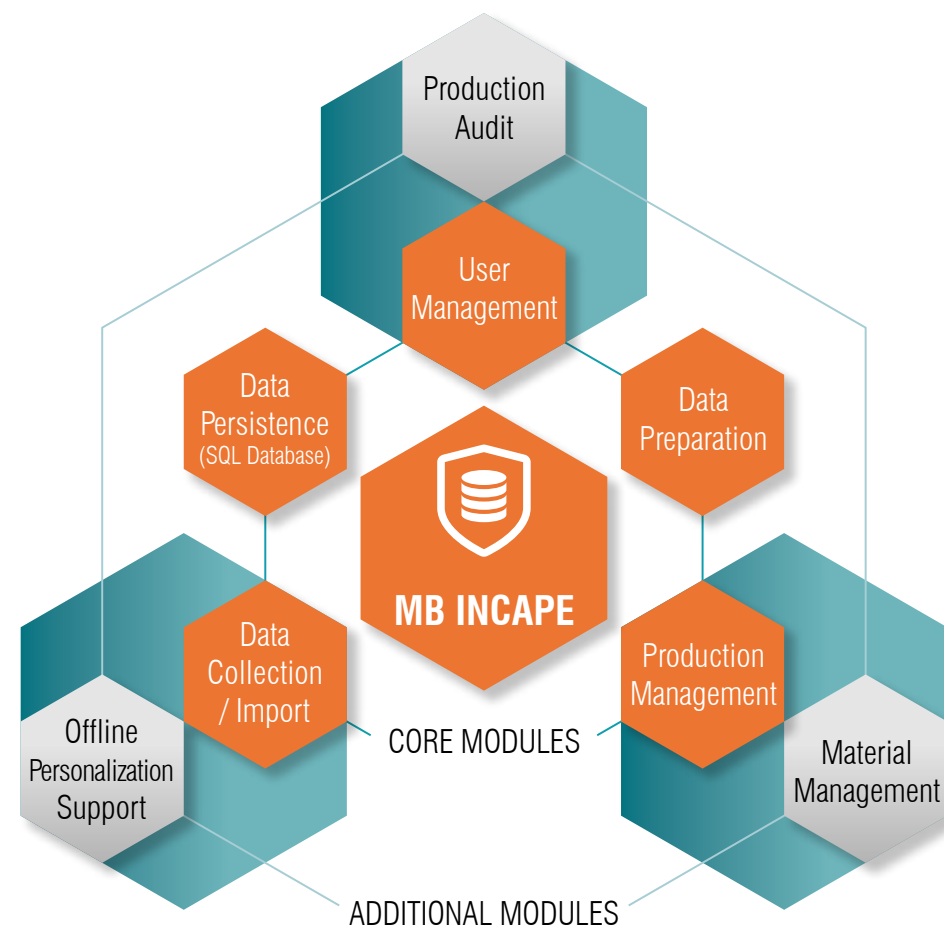
IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB INCAPE is Mühlbauer's Production Management Software for the production and personalization of electronic cards and documents (e.g. ID cards, ePassports, Driver's Licenses, EMV or GSM cards). Combining data management, production control and material management, the system allows for highly automated processes. MB INCAPE's architecture consists of a modular concept to fulfil the needed scalability in all kinds of document body production steps, as well as in all types of personalization characteristics, for example centralized and decentralized processes, various types of personalization machines or application-specific data preparation scenarios). It allows to process customer and application specific production, personalization, quality control and document delivery scenarios with highest solution flexibility.



FEATURES & ADVANTAGES

-  Configurable workflow steps regarding personalization, quality assurance and issuance
-  Fully-automated processing and production management
-  Simplified administration due to web-based operator clients
-  Customizable user interface regarding localization, internationalization and branding
-  Scalability regarding different documents, machines and personalization locations
-  Seamless tracking of documents from point of production to issuance
-  Flawless integration of Mühlbauer material management (MB WAREHOUSE)
-  Connection to card/document management systems via web service, database, file-based interface
-  Standard interface to personalization machines with integration of third-party machines possible
-  Integration of MB USER MANAGEMENT
-  Full coverage of production control requirements (security industry and EMV standards)
-  Seamless connection to MB PALAMAX® and MB DATA PREPARATION

ENROLLMENT
& ISSUANCE

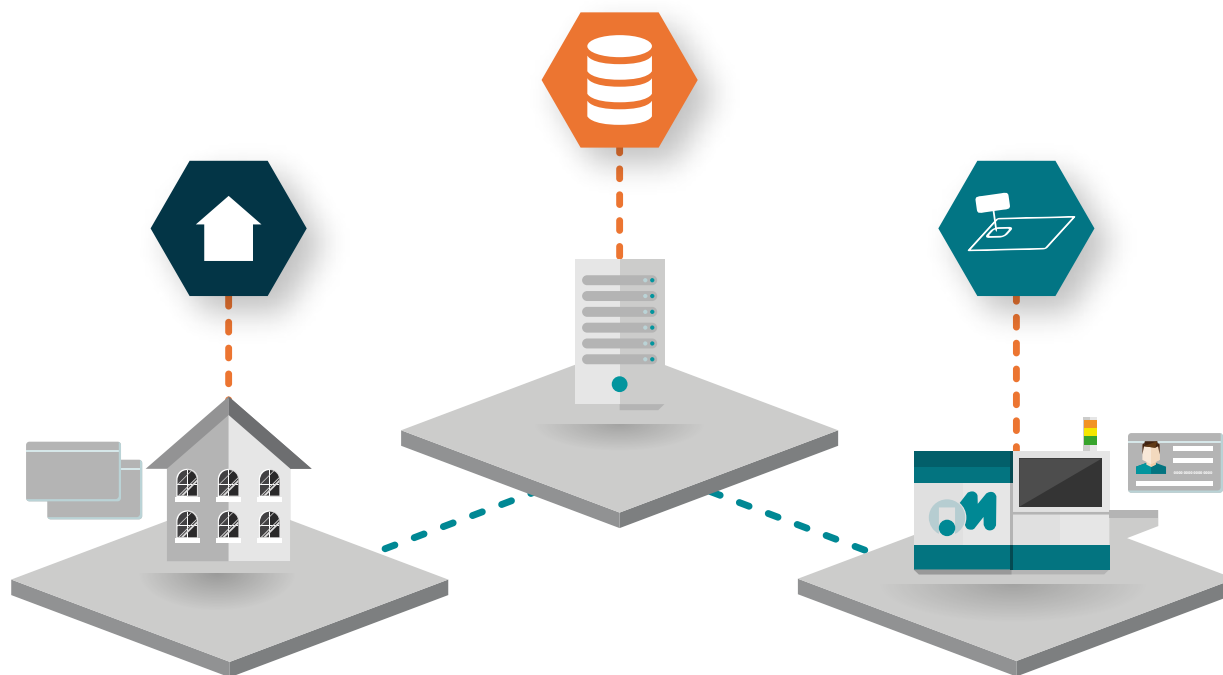
IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB WAREHOUSE covers the logical administration of materials which are stored in the central warehouse, as well as at the interim storages in the personalization environment. Incoming and outgoing blank or personalized documents must be managed, tracked and sorted. The material management system also provides information about the quantities and additional attributes such as serial numbers and storage locations. Additionally, MB WAREHOUSE notifies about materials which reached a critical quantity and should be reordered. With regard to the interim storages, this material management system is connected to MB INCAPE to automatically track the material flow during production.



FEATURES & ADVANTAGES

-  Fully-automated monitoring of complete process flow
-  Quality control of all incoming and outgoing materials and consumables
-  Bookkeeping of stored materials
-  Material preparation for personalization jobs
-  Tracking of blank documents, consumables and personalized documents
-  Initiation of ordering processes
-  Scalability regarding different documents, machines and personalization locations
-  Identification of documents by document number and storage location
-  Seamless integration with MB INCAPE
-  Custody transfer
-  Handling of responsibilities / operators

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

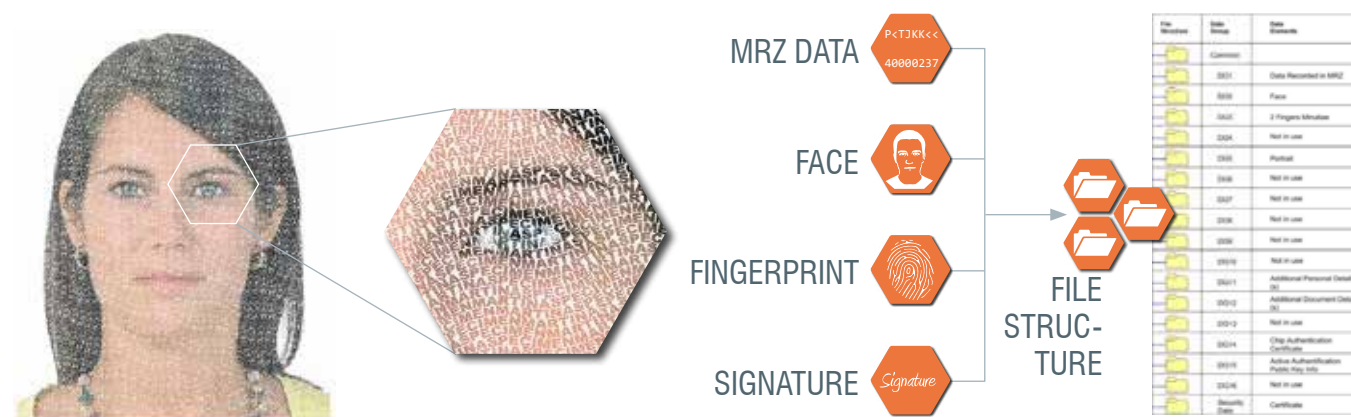
VERIFICATION



MB DATA PREPARATION

FOR ICAO COMPLIANT eMRTD

MB DATA PREPARATION provides interchangeable and customizable functions for implementing the preparation of personalization data for electronic travel documents in accordance with ICAO Doc 9303 and ISO/IEC 18013-2. The data is generated and delivered to the production management system in use. Moreover, MB DATA PREPARATION provides an interface to the PKI system in order to handle activation or encryption keys, as well as certificates for signing and encrypting electronic chip application data.



FEATURES & ADVANTAGES



VISUAL AND CHIP DATA PREPARATION (ICAO-COMPLIANT)

- Truncation, concatenation, formatting
- Value mapping, country codes transformation
- Image processing, resizing, enhancement, converting
- Data calculation (date of expiry)
- Barcode generation
- IPI, MLI picture generation
- Letter-screen support



MRZ DATA PREPARATION (ICAO-COMPLIANT)

- Data formatting, replacing, mapping
- MRTD-dependent support for first, second and third line MRZ



INTERFACES

- SOAP web service
- Document Signer
- Support of third-party plugins
- File interface
- Chip-coding DLL



Seamless integration with standard interfaces to MB TRUST, MB MCES and MB INCAPE

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



MB MCES is a personalization management software, which integrates incoming data with product definitions and controls the associated physical and electrical personalization processes. MB MCES handles personalization data from a variety of different input methods and formats and applies them to the cards, regard-

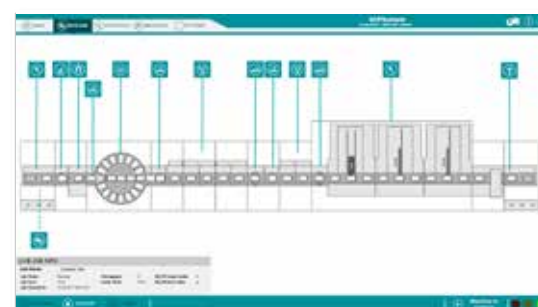
less whether magnetic stripe, chip encoding, or one of the various optical personalization processes such as thermo-transfer printing, laser engraving, embossing or indent printing. MB MCES manages all personalization processes within only one software system.

JOB PAGE



To do, In Progress & Finished Queues

MACHINE PAGE



Documents & their Current Locations

HELP PAGE



Documentation Display

SERVICE PAGE



Chip Coding Stations

MB MCES is able to supports different interface methods. The data acquisition handles the input files with a variety of different formats ranging from classic formats like Type-Length-Value (TLV) coded files, through Comma Separated Lists (CSV) flat files, to Extensible Markup Language (XML) files. The data required for the personalization process is merged with the product information within MB MCES.

All personalization data can be buffered in encrypted form. They are deleted after use. The backend of the MCES are Mühlbauer's master system and various processing units. After the personalization process is finished, all stored personalization data is deleted. These processing units operate the individual personalization actions during which a large amount of logging data is generated which allows the generation of reporting information in Extensible Markup Language (XML) format, which can be transformed into any required format.

FEATURES & ADVANTAGES

-  Product Designer: layout & product design for different products
-  In-line card data testing data pre-test, sample post-test & full test
-  Flexible reporting
-  SDK Vendor-independent position through powerful SDK
-  System simulator
-  Multiple data input formats
-  Chip OS specific coding applications
-  Configurable payment application scripts
-  High-secure document & data processing
-  User configuration
-  Messenger page displays all production data & incidents

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

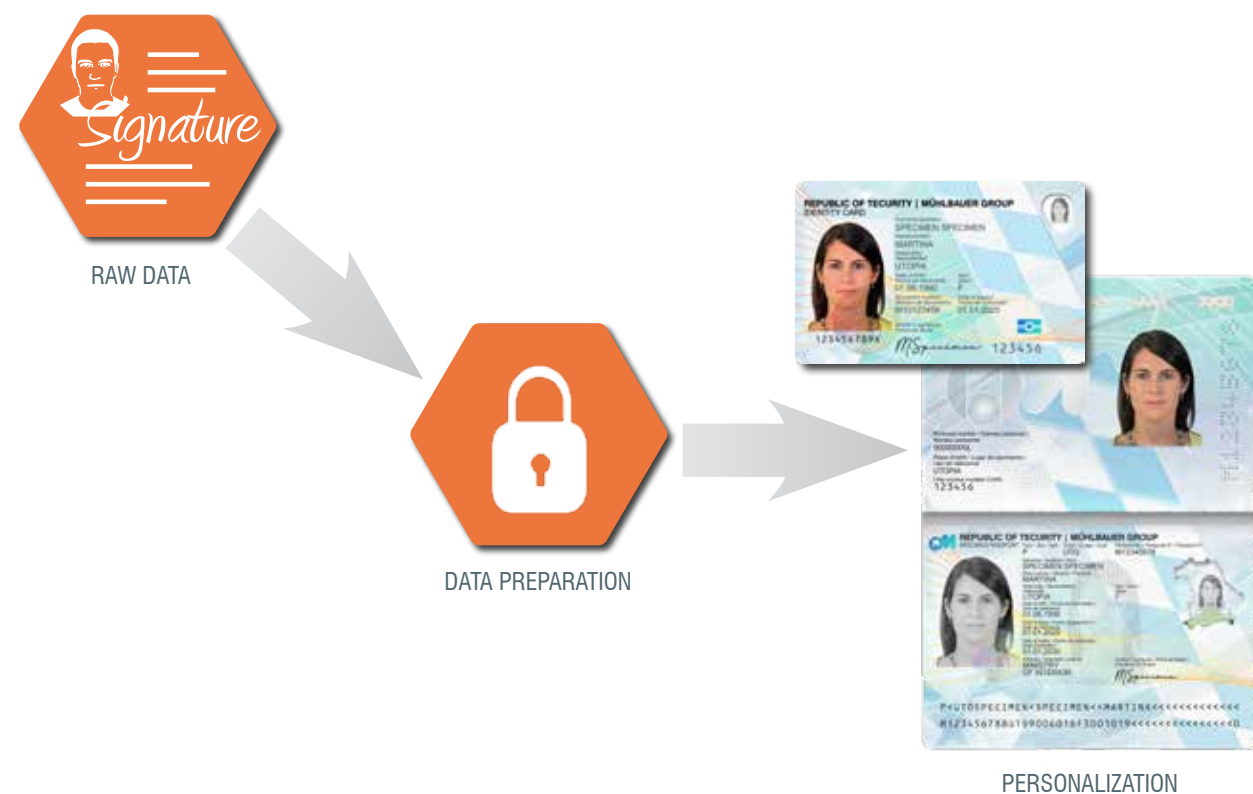
PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



Mühlbauer's customized Chip Coding Application guarantees the successful personalization of ICAO (International Civil Aviation Organization) compliant ID chip applications with BAC and SAC functionality or EAC functionality. Based on our broad experience and background in ID projects, we develop ID personalization ap-

plications according to your requirements with state-of-the-art technologies. Furthermore, we support you with our professional services during every step of the development process: specification, design, implementation and testing.



- Personalization of Basic Access Control (BAC) & Supplemental Access Control (SAC) or Extended Access Control (EAC) passports & ID cards
- Increased security: Uses PACE v2 (Password Authenticated Connection Establishment) & asymmetrical encryption
- SAC & EAC secure the chip access control mechanism & allow the usage of the Card Access Number (CAN)
- Mandatory for electronic passports issued in Europe from 2014 on
- Recommended by ICAO for all new issued passports worldwide
- Fully compliant to BSI (Federal Office of Information Security) & international standards
- Seamless transition: compatible to BAC
- Easy-to-use chip coding applications, customizable to individual requirements
- No modification of personalization hardware necessary

FEATURES & ADVANTAGES



ICAO-compliant, electronic ID documents provide highest security for the identification and authentication of the cardholder. Electronic ID cards and passports have a security chip embedded, which stores personal and biometric cardholder data. Several security mechanisms protect the cardholder data against unauthorized access, in order to ensure the authenticity of the ID document and protect it against forgery.



BASIC ACCESS CONTROL (BAC) / SUPPLEMENTAL ACCESS CONTROL (SAC)

Basic Access Control (BAC) protects the chip against skimming (reading content from a distance) and ensures the information exchanged with the reading device is encrypted. BAC and PACE (Password Authenticated Connection Establishment), i.e. Supplemental Access Control (SAC), additionally strengthen the chip access control mechanism.



EXTENDED ACCESS CONTROL (EAC)

Extended Access Control (EAC) provides the full BAC functionality, but also includes several advanced security protocols like chip authentication (detection of cloned chips) and terminal authentication and provides additional security.

An ID chip personalization application takes the personalization information of the document holder and encodes it to the integrated chip in the security document, e.g. ePassport or ID card. The application securely encodes the chip's files and datagroups according to the individual project requirements. This results in a fully personalized and valid ICAO document.

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& ISSUANCE

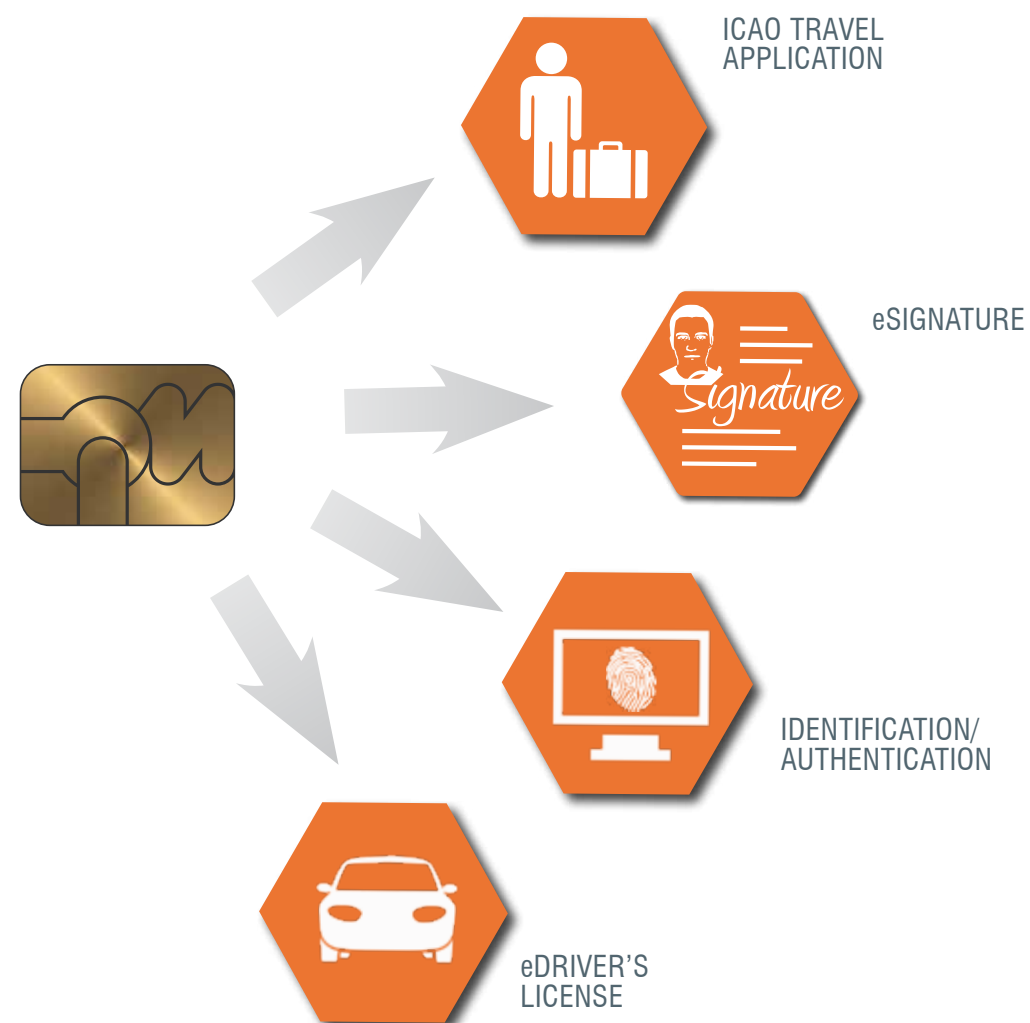
IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



The MB eMRTD Applet enables smart cards based on JavaCard standard to perform all the functions required for an ICAO-compliant electronic machine-readable travel document (eMRTD) or an electronic driver's license according to IEC/ISO 18013.



FEATURES & ADVANTAGES

-  ICAO Doc. 9303 compliant data content & formats
-  Passive Authentication (PA) to prove data integrity
-  Active Authentication (AA) to prevent cloning
-  BAC Basic or Supplemental Access control (BAC or SAC) for data privacy
-  Extended Access Control (EAC) for enhanced security features
-  SSCD SSCD according to EU standards
-  eDL Electronic Driver's License according to IEC/ISO 18013
-  UID Support of random UID to protect document holders from unallowed tracking
-  Provision of the signature of the chip data of the ICAO LDS (SOD)
-  PKI Special PKI required, e.g. MB TRUST (see pages 24/25)

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

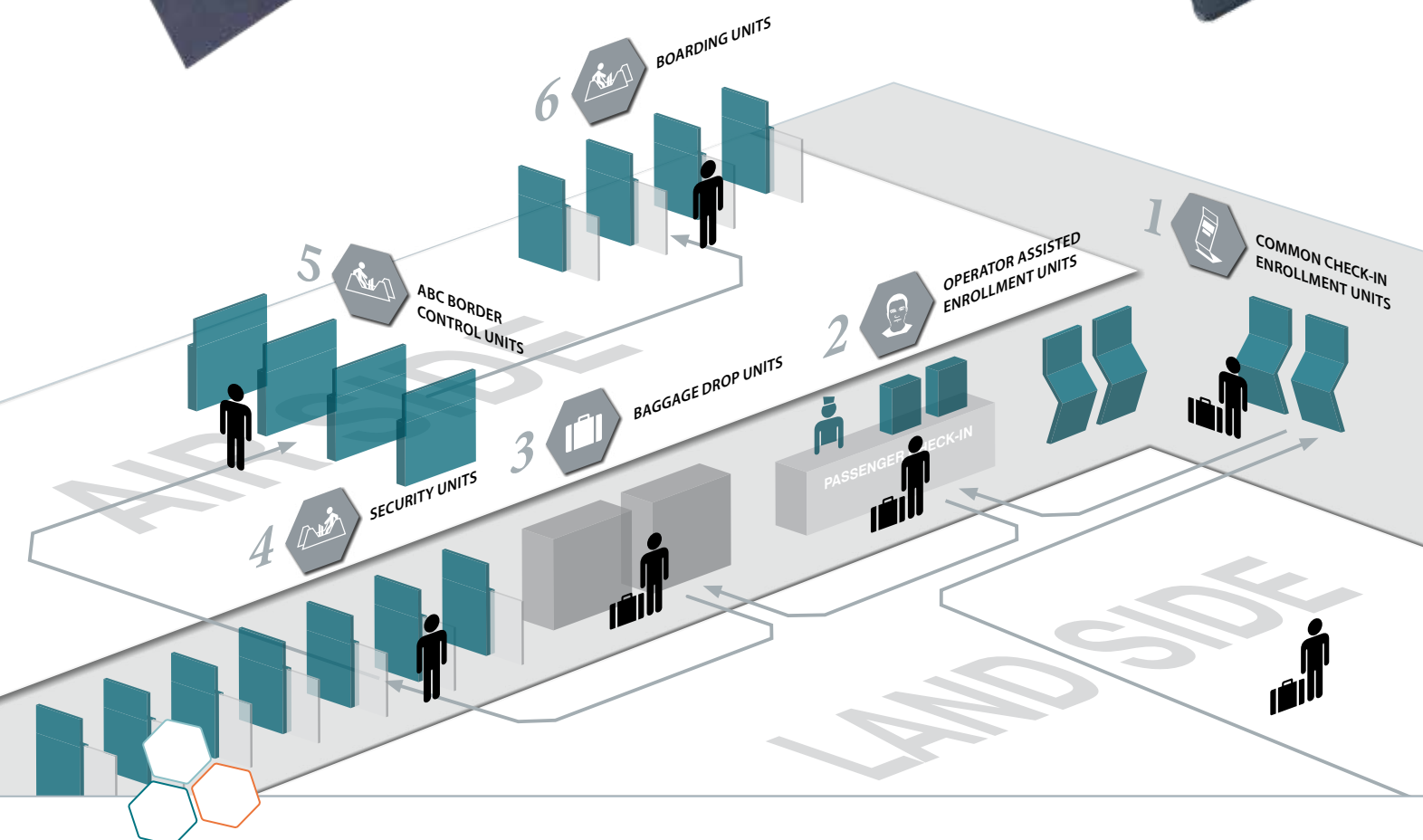
PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



THE FUTURE OF AIRPORT TRAVELER MANAGEMENT

MB IDVERSO® FASTLANE guarantees the efficient and reliable administration of passenger and baggage handling, border control and boarding. Based on the autonomous operation of each single process step by the passenger, this highly sustainable solution ensures an optimized process flow. State-of-the-art technologies perfectly meet the demands imposed by the constant increase of passenger volumes. Based on the system of biometric data processing and management, MB IDVERSO® FASTLANE combines three sub-processes: Automated Border Control, on-the-fly security systems and self-boarding systems without any physical barriers. To ensure the most efficient use of these components, a comprehensive cooperation between governmental authorities, airport operators, airlines and the solution provider is essential.



AUTOMATED FASTLANE PROCESS

An individual token, which refers to a dataset of enrolled and process data, functionally connects the separate units. The dataset consists of a combination of demographic and biometrical data such as face, fingerprint and iris, as standardized by ICAO. The token is temporarily stored in the airport's background system. The data is used to validate the traveler's identity throughout the whole process on all biometrical interfaces.

During the automated FASTLANE process, the passenger autonomously performs the defined process steps:

STEP 1: SELF-ENROLLMENT & CHECK-IN

The passenger enrolls at a common use self-boarding kiosk which reads out the boarding pass and matches the information with the data stored on the ePassport. With the personal and biometric data provided by the passenger, the identity authentication is performed and the temporary token is created.

STEP 2: OPERATOR-ASSISTED ENROLLMENT

In case of operating errors or technical problems at the self-boarding kiosk, an additional service terminal is provided. This is where service staff assists passengers with the enrollment and check-in.

STEP 3: BAGGAGE DROP-OFF

Specific self-service units are provided for the baggage drop-off. The background system identifies the passenger by matching live data with the temporary token, and processes the luggage data. The luggage is equipped with a physical token and the data is added to the enrolled passenger's information dataset.

STEP 4: SECURITY CHECK

The security units separate the land side from the air side. Once travelers pass through the security check, they are automatically identified and the status "passed security check" is added to their datasets. Within the air side, the temporary token allows for the passenger's automatic authorization to use duty-free shops, lounges, as well as premium- and VIP-services.

STEP 5: BORDER CONTROL

At an ABC unit, the border crossing is performed within the air side. The passenger's biometrics are captured and matched with the virtual token for the reliable identification. Secondly, the data is matched with international watch lists in order to identify criminal or high-risk passengers. After successful verification, the passenger receives clearance for entry.

STEP 6: BOARDING

Upon the passenger's arrival at the boarding unit, the background system automatically captures the face biometrics and matches them with the virtual token. The passenger can instantly pass the unit without delay and the dataset referred to by the token is enhanced by the status "on board".



ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION

MB STEEL READER

DOCUMENT VERIFICATION SOFTWARE

MB STEEL READER is a software solution for examining electronic identification documents in combination with a full-page document reader. It is designed to use secure communication channels to read the chip data via BAC/BAP, SAC or EAC. MB STEEL READER supports ICAO Doc. 9303-compliant travel documents, international Driver's Licenses (iDL based on ISO/IEC 18013) and electronic Vehicle Registration Cards (eVRC).

FEATURES & ADVANTAGES

-  Various fields of application such as production release, quality assurance and verification in the field
-  Complete verification, including chip authentication
-  Provision of overview of visual data, MRZ and chip data
-  Verification of physical security features on visible image, infrared image and UV image
-  Verification of electronic security features such as PA, AA and CA
-  Management of CSCA certificates and revocation lists for verification
-  Comparison of holder-page information (MRZ, photo) and chip data
-  Optional comparison of document data and corresponding record in a database
-  Three forms of data representation: interpreted data, hexadecimal, Type-Length-Value
-  Possibility to store document information for future examination



ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



Electronic Machine-Readable Travel Documents (eMRTD) like biometric ePassports and eID cards require appropriate reading devices to access the information and to compare and verify the document and its holder. In order to allow for mobile verification anywhere inside a security area and at any time, the MB STEEL READER MOBILE App checks electronic travel documents and verifies travelers based on face recognition against the eMRTD.

ICAO Doc 9303-compliant eMRTDs as well as ISO 18013-compliant driver's licenses can be verified by the chip content or by using internal and external services offering additional document information, white-lists, stop-lists etc. A built-in face-matching feature allows to verify the holder's image on the chip against a live face image of the traveler. Besides physical cards and passports, MB STEEL READER MOBILE can also verify mobile identification documents such as MB TECURE-ID®.

Since MB STEEL READER MOBILE allows for secure document and person verification with standard mobile devices like smartphones, tablets or other commodities, specialized reading equipment or stationary inspection counters are no longer needed.

FEATURES & ADVANTAGES

VISUAL VERIFICATION

- MRZ recognition
- MRZ verification of check digits
- Live face-image verification against eDocument in online and offline mode

CHIP ACCESS

- Support of ISO 14443 Interface
- Usage of MRZ to access the chip
- Manual Data entry as fallback
- Comparison of optical MRZ and MRZ data from chip

SECURITY PROTOCOLS

- Basic Access Control (BAC)
- Supplemental Access Control (SAC)
- Password Authenticated Connection Establishment (PACE)
- Support of Card Access Number (CAN)
- Passive Authentication (PA)
- Active Authentication (AA)
- Extend Access Control (EAC)
- Chip Authentication (CA)
- Terminal Authentication (TA)



SERVER-BASED-VERIFICATION

- Secure identification of the card holder using face match of
 - » Digital image from background system against live photo
 - » Digital image from chip against live photo
- Support of
 - » CSCA/DS certificates
 - » Stop lists
 - » White lists
 - » Master lists
- Compliant with following standards
 - » ICAO Doc 9303 Machine Readable Travel Documents (MRTD)
 - » ISO/IEC 19875 Common Biometric Exchange Framework Format
 - » ISO/IEC 19794-4 Fingerprint image
 - » ISO/IEC 19794-5 Facial image

ENROLLMENT
& ISSUANCE

IDENTITY
MANAGEMENT

PERSONALIZATION
& PRODUCTION
MANAGEMENT

VERIFICATION



GLOSSARY

AA	Active Authentication	ICAO	International Civil Aviation Organization
ABIS	Automated Biometric Identification System	ICR	Intelligent Character Recognition
AFIS	Automated Fingerprint Identification System	IDL	International Driver’s License
AI	Artificial Intelligence	IRS	Iris Recognition System
AMS	Appointment Management System	LDS	Logical Data Structure
API	Application Programming Interface	MRTD	Machine-Readable Travel Document
BAC	Basic Access Control	MRZ	Machine-Readable Zone
BAP	Basic Access Protocol	NFC	Near Field Communication
CA	Chip Authentication	OCR	Optical Character Recognition
CAN	Card Access Number	OEE	Overall Equipment Effectiveness
CRL	Certificate Revocation List	OS	Operating System
CSCA	Country Signing Certificate Authority	PA	Passive Authentication
DLL	Dynamic Link Library	PACE	Password Authenticated Connection Establishment
DS	Document Signer	PKD	Public Key Directory
EAC	Extended Access Control	PKI	Public Key Infrastructure
eDL	Electronic Driver’s License	QMS	Queue Management System
eMRTD	Electronic Machine-Readable Travel Document	SAC	Supplemental Access Control
eVRC	Electronic Vehicle Registration Cards	SDK	Software Development Kit
FAR	False Acceptance Rate	SDM	Secure Document Management
FRR	False Rejection Rate	SOAP	Simple Object Access Protocol
FRS	Face Recognition System	SSCD	Secure Signature Creation Device
GSM	Global System for Mobile Communications	TA	Terminal Authentication
HSM	Hardware Security Module	UID	Unique Identifier



NOTES





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