BORDER MANAGEMENT TODAY

Issue 011 | May 2024

WHAT'S HAPPENING AT THE EU BORDER?:
IBMATA HAS IT ALL

REFLECTIONS FROM PRAGUE:
A VERY SPECIAL GATHERING

DRIVE THROUGH BORDERS:
THE LATEST CHAPTER

GUARDING THE EU BORDER:
A VIEW FROM THE FRONT LINE

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BORDER MANAGEMENT TODAY

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Message from the Chairman

Welcome to our eleventh edition of "Border Management Today".

In this issue our focus returns to Europe – and specifically to EU borders. At IBMATA we pride ourselves on bringing real experts from both government and industry together to discuss the very latest developments in border management. This cannot be done without the support of border agencies from host countries – so it was a real pleasure and a privilege to work with our friends from Czechia to bring together some very high-quality speakers from EU Member States and EU institutions in the beautiful city of Prague, in February. We cover the highlights of the event in this edition. We also include in this issue our usual mix of contributions from international government organisations and border agencies (Frontex, EU Lisa, DG Home & Estonia border guard); academia (Project Einstein); and leading suppliers of best-in-class border related technologies and systems.

One thing that we learned in Prague is that the life of a border guard is constantly changing, in response to world events. Many of us were moved to tears by the heartfelt presentation from Lieutenant General Andril Kucherenko, Adviser to the Head of State Border Service of Ukraine, as we remembered his fallen border guard comrades working on the front line with Russia. We were shocked to hear of the very significant challenges facing border guards in Finland and Estonia – and from Frontex – who are facing up to a variety of challenges on the EU Eastern border including drone incursions and weaponisation of irregular migrants, which have led to the closure of many BCPs on the Eastern front. We have an excellent article in this edition from Veiko Kommusaar, Head of the Estonian Border Guard, setting out the stark challenge of "hardening" a border with a hostile neighbour using additional barriers and technology - as opposed to "softening" it to facilitate the flow of travellers.

At the same time, we discussed in detail the significant delays that are likely to accrue on the EU Western border with the UK when the new EU Entry / Exit System (EES) is introduced - especially on key arteries for tourism and travel across the English channel (and through the channel tunnel between the UK and France) when new biometric checks for British travellers kick in later this year. This could lead to very significant delays for British passport holders seeking to cross to France and the EU, with a knock-on impact to services and a wider impact upon economic growth on both sides. Many of our articles in this edition provide more details of this, and how technology might be able to help in the future.

It is challenges such as these where the IBMATA family shows its true value, as we come together with leaders and experts from both government and industry in a spirit of collaboration to brainstorm potential solutions to border management in an inceasingly complex world.

I hope you enjoy our latest edition of "Border Management Today" – and I look forward to seeing many of you at our upcoming IBMATA (Americas) Summit which will be hosted by US Customs & Border Protection in Miami, Florida, USA on 4 – 6 June 2024.

Tony Smith

Tony Smith CBE,

Chairperson *at* International Border Management and Technologies Association

HIGHLIGHTS FROM PRAGUE

WELCOME ADDRESS FROM PAVLA NOVOTNA, DIRECTOR OF ASYLUM AND MIGRATION POLICY IN CZECHIA

OLIVIER ONIDI, DEPUTY DIRECTOR GENERAL, MIGRATION AND HOME AFFAIRS, EU COMMISSION.

UKO SAREKANNO, DEPUTY EXECUTIVE DIRECTOR, FRONTEX.

Our IBMATA (Europe) Summit in Prague in February 2024 was an outstanding success, due in no small measure to the fantastic support we received from our hosts from the Czechia Ministry of the Interior. With their help we were able to provide the very best hospitality for all our speakers, sponsors and delegates alongside an excellent programme covering the very latest developments on EU border management.

The welcome address came from Pavla Novotna, Director of Asylum and Migration Policy in Czechia, who treated us to a fascinating speech mixing her own personal experiences as a young girl growing up in the shadow of the Berlin wall to the challenges of her current role in implementing EU Asylum and Immigration policies in a country landlocked within the Schengen zone, which has no internal borders. Czechia is one of the EU countries at the very heart of Europe; and as such they are very well advanced in implementing new EU Programmes such as the upcoming EES and ETIAS projects at Prague airport.

We were then treated to presentations from senior leaders from the EU institutions including Olivier Onidi (Deputy Director General, Migration and Home Affairs, EU Commission); Agnes Diallo (Executive Director, EU LISA); and Uko Sarekanno (Deputy Executive Director, Frontex). They each gave us a very thorough overview of the European Roadmap for borders covering current EU policy regarding the implementation of the EES and ETIAS projects; technical architecture for the external EU borders; and enhancing border security (particularly at the Eastern border given heightened tensions with Russia).

PANEL DISCUSSION DISCUSSING POTENTIAL TECHNOLOGIES THAT MIGHT PRESERVE FLUIDITY OF PASSENGER VEHICLES WHILST SIMULTANEOUSLY MEETING EU COMPLIANCE AND SECURITY REQUIREMENTS.

This was followed by a panel discussion hosted by Isaac Hawari, Intelligent Optical Solutions from Rapiscan and including David Marteau, Head of European Affairs, Getlink Group (Eurotunnel) discussing potential technologies that might preserve fluidity of passenger vehicles whilst simultaneously meeting EU compliance and security requirements. Several IBMATA members have been working on alternative pre-registration and "drive through" border solutions which was the subject of a previous IBMATA workshop in Brussels in 2021 (reported in BMT 7). The panel concluded that although technical alternatives might be feasible in future, this will not be possible at point of introduction (expected in October or November 2024). This topic was explored in more detail in subsequent presentations from Marian Geleta (Head of ETIAS and VIS Front Office, Europol); Seb Dumortier, Legal Director at Getlink; and Dave Harmon, Business Development Director, Intelligent Optical Solutions at Rapiscan.

NIGEL FARMINER, HEAD OF PASSENGER POLICY AND BORDER TRANSFORMATION, UK HOME OFFICE.

During the afternoon of Day One we continued our theme of future borders with presentations from Sunil Madhugiri (CTO, US Customs and Border Protection) and Nigel Farminer (Head of Passenger Policy and Border Transformation, UK Home Office). It was evident from these presentations that both the US and the UK are driving ahead with new technologies in border processing, using technology to verify identity and entitlement in advance of arrival wherever possible. In particular the Home Office is pressing ahead with its "Universal Permission to Travel (UPT)" with the roll out of the UK ETA to Gulf States in February and a proposed global roll out by the end of 2024.

This was followed by presentations from Katie Wong (Accenture) and Andy Smith (SITA) covering the use of data to facilitate the end-to-end traveller journey and seamless travel respectively.

SEB DUMORTIER, LEGAL DIRECTOR, GETLINK.

MARIAN GELETA, HEAD OF ETIAS AND VIS FRONT OFFICE, EUROPOL.

KATIE WONG, ACCENTURE.

PANEL DISCUSSION ON THE THEME OF SEAMLESS TRAVEL FROM AN AIRPORT PERSPECTIVE.

Our second panel continued the theme of seamless travel from an airport perspective. This was moderated by Nigel Manns from Sompapa IT and included Steve Armitage (Head of Technology and Design, Heathrow Airport), Patrick Sgueglia (Senior Product Manager, Lufthansa Group) and Petr Zollman, Security Manager at Smartwings).

The day concluded with presentations from Veiko Kommusaar, Deputy DG for Border Management, Estonian Police and Border Guard and Lt Gen Andril Kucherenko, Adviser to the Head of State Border Service in Ukraine. This gave us all a stark reminder that the life of a Border Guard is not always easy in times of hostility; and those at the front line at borders in times of conflict can often pay the ultimate price. Indeed, Lt Gen Kucherenko set out details of awards given posthumously to some of his colleagues, in a presentation described by many in our audience as the most heartfelt and moving ever seen at an IBMATA event.

VEIKO KOMMUSAAR, DEPUTY DG FOR BORDER MANAGEMENT, ESTONIAN POLICE AND BORDER GUARD.

LT GEN ANDRIL KUCHERENKO, ADVISER TO THE HEAD OF STATE BORDER SERVICE IN UKRAINE.

Day Two kicked off with a panel discussion hosted by Ramesh Ramakrishnan from Mastek, who was given a rousing rendition of Happy Birthday by our IBMATA family before opening up a debate with panellists from the Federal Office for Migration and Refugees Germany (Heiko Werner)); the European Union Agency for Asylum (EUAA – Jana Coulee); and the UK Home Office (Nigel Farminer). This discussion covered potential opportunities to disrupt organised crime gangs conducting human smuggling operations across borders, and latest techniques for verifying age, identity and nationality of undocumented migrants crossing borders to claim asylum.

LOREN FLOSSMAN, COCHRANE GLOBAL

This was followed by a presentation from Loren Flossman from Cochrane Global setting out the latest developments in land and marine barriers at borders; and another from Ivanka Spadina, Senior Programme Co-ordinator from IOM explaining how the IOM can support nations in dealing with mass migration and asylum claims.

The agenda then shifted to identity verification, data sharing, and joint targeting to enhance border security and tackle terrorism and organised crime across borders. Neil Illingworth set out details of the "i-proov" system of secure facial recognition; and Johanna Morley set out latest details of innovation at Interpol's biometric hub and the importance of data quality at point of capture to maximise matching capabilities against criminal databases.

This was followed by a joint presentation from Moe El-Hamalawy and Farid Moussa from Babel Street, setting out how artificial intelligence can be harnessed to support integrated border management.

PANEL DISCUSSION DISCUSSIONG HOW PASSENGER DATA ANALYTICS CAN BE USED TO SUPPORT BORDER SECURITY MEASURES.

Andy Smith from SITA then moderated a panel comprising of Mario Wiesen (Office of the Passport, Visa and Legalisation Office, Luxembourg), Simon Deignan (Programme Manager, United Nations Centre for Counter Terrorism – UNCCT), Marian Geleta (Europol) and Marek Martinek (Czechia Customs) to discuss how passenger data analytics can be used to support border security measures.

During the afternoon of Day 2 our focus shifted to Customs facilitation and enforcement. Randy Barnby from S2 Global delivered a presentation on the expanding use of AI to Cutoms applications. This was followed by a debate hosted by Novel Daniyel (also from S2 Global) and Sunil Madhugiri (CBP) on the use of big data to identify high risk shipments, and the expansion of "Non-Intrusive Inspections" (NII) at the US border. Then Marek Stepan provided us with an overview of the Customs Administration of Czechia.

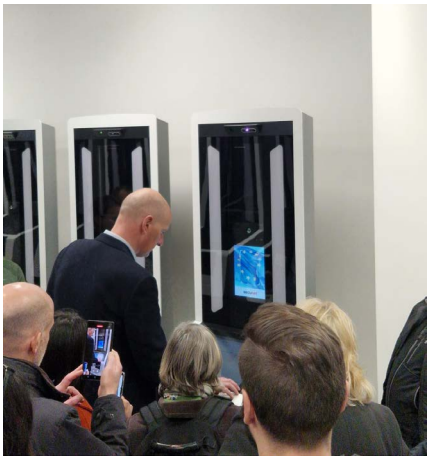
Our final session included presentations from Mathieu Guillebaud from Leidos on balancing facilitation and security at borders; from Christian Piaget from IATA on how IATA supports cargo checks on goods entering the EU; and from Samy Gardemeister, Director of Enforcement, Finnish Customs on the implementation of EU Sanctions against Russia and Belarus.

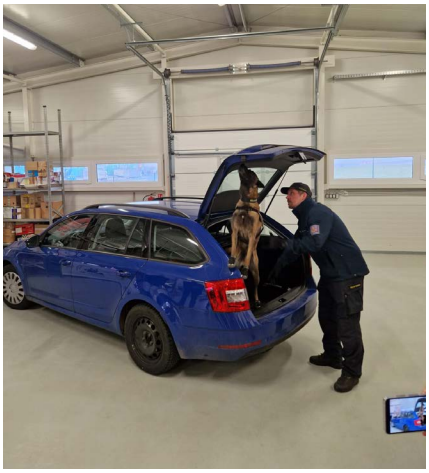
Overall, the event gave us a stark reminder that armed conflict has reached the Eastern borders of the EU which has had a drastic impact upon operations there, with many border crossing points now closed and constant threats of attack either by pushing migrants to the external frontier or by forms of technology such as drones. Whilst at the same time there will be challenges on the facilitation of British tourists on the Western Border as new biometric checks on non EU nationals come into play later this year.

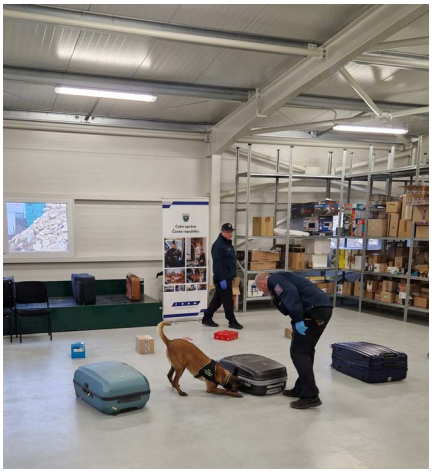
The Czechia Home Affairs and Customs Ministries kindly treated delegates to a tour of operations at Prague Airport on Day 3. Groups were given a demonstration of the new EES kiosks now installed in the passenger hall; and also a live presentation of Customs interventions on freight – including the magnificent Czechia detection dog teams.

Once again we would like to thank our hosts from the Czechia Ministry of Home Affairs for hosting our European Summit in the beautiful city of Prague – and all our sponsors, speakers, panellists and delegates for their enthusiastic support.

Next stop – Miami, USA – 4 June. Register now https://bit.ly/BMTSAmericas2024.







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- **Diane Sabatino**, Acting Executive Assistant Commissioner, Office of Field Operations, **U.S. Customs and Border Protection**
- **Jonathan Miller**, Executive Assistant Commissioner, Air and Marine Operations, **U.S. Customs and Border Protection**
- **Tayra Barsallo**, Director-General, **National Customs Authority, Panama**
- **Kara Claxton**, Director, Detection and Goods Transformation, **UK Home Office**
- **Scott Shockey**, Chief, Systems Business Operations Branch, Office of Biometric Identity Management, **U.S. Department of Homeland Security (DHS)**
- **Gustavo Lacerda Coutinho**, Head of Customs Risk Management Center, **Federal Revenue of Brazil (RFB)**
- **Andrew Wynter**, Chief Executive Officer, **Passport, Immigration and Citizenship Agency, Jamaica**
- **Katrina Yearwood**, Chief Immigration Officer, **Ministry of Foreign Affairs and Immigration, Antigua and Barbuda**

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FEATURE

By Mikko Hakkarainen, Policy Officer, Document Security and Identity Management Team, Directorate-General for Migration and Home Affairs (DG HOME) of the European Commission.

Co-author: Alexandra-Ioana Andronache, seconded to DG HOME from the Romanian Ministry of Interior.

Identity control at European borders – from beads and baubles to bits and bytes

THE ORIGIN STORY

In an area without internal border controls, managing identities is essential to ensure the internal security of the European Union and the smooth transit of goods and persons across well-functioning external borders. The border-free Schengen Area guarantees free movement to more than 450 million EU citizens and non-EU nationals living in or visiting the EU as tourists, exchange students or for business purposes. Schengen upholds this freedom of movement by enabling citizens to move around the Schengen Area without being subject to border controls.

While identity, in the broader sense, encompasses sets of personal traits, qualities, appearance as well as belief systems and other expressions defining or characterising a person, in the context of border management and immigration, identity is limited to biographic and biometric information. This set of data essentially allows someone to say, "yes, that is the person they claim to be or whom I am looking for". Travel documents, that is, documents issued by governments or international organisations that are accepted as proof of identity for the purpose of entering another country[1], are at the heart of controlling identities at borders.

Historically, the nature of such travel documents resembled that of visas or letters of recommendation, giving its holder a right of travel: a token from the traveller's sovereign as proof of title, privileges and rights. Passport booklets were introduced in Europe in the 1800s, and instead of a picture, would include a description of its holder, including name, stature, hair, eyes, face and any specific marks. In the early 1900s, passport booklets with photographs started circulating. However, in the absence of global standards for the layout and type of image, passports were brandished with rather delightful photos, as most passport collectors can attest to[2].

1 European Migration Network, glossary, derived from IOM Glossary on Migration, 2nd edition, 2011.

2 With thanks to Tom Topol for his permission to use these images from T. Topol, Let Pass or Die – Passport History, Ettlingen Self Publishing, 2019.

The first "EU" intervention in the space of travel documents can be traced back to 1954, when the first laissez-passer documents were issued to personnel of the European Coal and Steel Community. Between then and this day, several initiatives at international and EU level have been put forward to ensure global interoperability, increase security and ultimately facilitate travel across state borders.

Following the establishment of the Schengen area in 1985, that has grown from five to 29 European countries, the EU has introduced several tools ranging from uniform formats for paper-based documents and secure storage media (chips) in travel documents to comprehensive databases containing biographic and biometric data of people.
To ensure a good governance of this border-free area, the EU also introduced rules on the issuance of short-stay visas, residence permits, border controls and measures compensating for the absence of border controls at internal borders as well as judicial cooperation have been harmonised through several legal acts.

THE BITS AND BYTES: IT SYSTEMS AND DIGITAL TRAVEL DOCUMENTS

As a result of the increase in traveller volumes throughout the years, coupled with global conflicts and crises leading to irregular border crossings and threats to Europe's internal security, the EU has had to step up its efforts on border management. Ever since the roll-out of the first Schengen Information System (SIS) in 1995, the system has helped Europe preserve its security, allowing authorities to enter and consult alerts on people and objects in a single common database. The SIS has become the most widely used and largest information sharing system for security and border management in Europe. Moreover, since 2003, the Eurodac system, comprising biographic and dactyloscopic (fingerprint) data of asylum seekers, has helped Member States with the management of asylum applications. In addition, the Visa Information System (VIS) which entered into operation in 2011, has contained information of short-stay visa applicants and visa holders.

The next wave in digitalising the external borders is taking shape with the Entry/Exit System (EES), followed by the European Travel Information and Authorisation System (ETIAS).

The EES will digitally record non-EU nationals travelling to the Schengen area for a short stay, removing the need to stamp passports upon entry and exit. It will not only modernise border management but it will ultimately provide a better travel experience. Travellers will be able to check online their allowed remaining duration of stay, while overstayers will be automatically identified and detected. In addition, a mobile application will progressively be made available by the Schengen countries choosing to do so, allowing travellers to remotely pre-register with their facial image and identity data, reducing the amount of time spent at physical border crossing points.

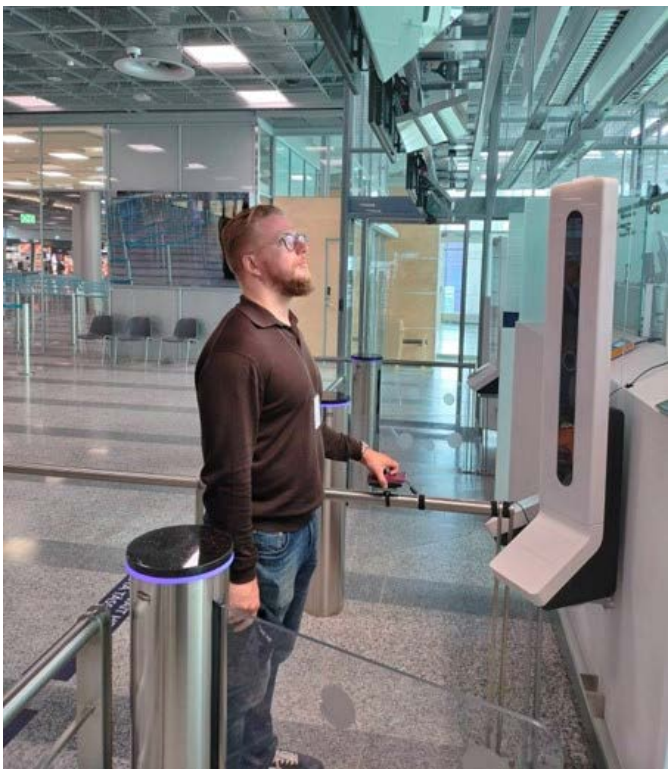
As another novelty, travellers from visa-free countries will soon need to apply for an ETIAS travel authorisation before travelling to the EU, which involves security, illegal immigration and high

epidemic risk assessments by national authorities. The travel authorisation, once issued, is valid up to three years or until the end of the validity of the travel document registered during application, whichever comes first.

The first uniform format for short-stay visas was introduced in 1995 and has since been revised several times, introducing new security features to combat document fraud. After the upgrade of the visa sticker in 2019, it was only a matter of months for high-quality forgeries and counterfeits started to emerge. During the Covid-19 pandemic, QR codes – or more accurately – different types of digitally signed barcodes made a comeback, showcasing their added value for verifying the authenticity and integrity of data in non-electronic documents. At least partly inspired by these efforts, the EU introduced a cryptographically signed digital seal (or two-dimensional barcode) on visa stickers, increasing their security. This digitally signed barcode, just like the chip of a correctly issued valid travel document, is impossible to replicate or alter in a way that would pass as the real deal.

More recently, the EU adopted rules on digitalising the visa application process, on dematerialising the current visa sticker, and refining the visible digital seal, one that contains the holder's facial image. In the future, visa holders will still be issued a barcode they can show for inspection by parties that do not have access to the Visa Information System.

While physical passports will undoubtedly continue to exist in the near-future, the EU is moving forward on the digitalisation front by introducing digital travel documents in the cross-border travel domain. The ongoing EU-funded pilot projects in Finland, Croatia and the Netherlands have demonstrated the advantages of such digital documents, benefitting both travellers in terms of faster border controls and border authorities by enabling them to do the necessary checks in advance and removing bottlenecks at physical border crossing points. This initiative is closely linked with the other ongoing developments on border management, for example, by allowing non-European travellers to pre-enrol several data remotely, reducing the amount of time for border checks. European Member States can allow European digital identity wallet users to use the same digital travel documents for proof of identity beyond the travel use case.



WRITER, COMMISSION OFFICIAL AND PILOT PROJECT PARTICIPANT, MIKKO HAKKARAINEN, PASSES THROUGH BORDER CONTROL IN AROUND 5 SECONDS AT HELSINKI-VANTAA AIRPORT HAVING SUBMITTED HIS DIGITAL TRAVEL DOCUMENT FOR PRE-CHECK AND GOING THROUGH PASSPORT CONTROL BY SIMPLY TAPPING HIS CLOSED PASSPORT ON THE READER AND BEING BIOMETRICALLY MATCHED TO THE DIGITAL TRAVEL DOCUMENT THAT WAS SUBMITTED AHEAD OF TRAVEL (ICAO DTC TYPE 1).

INNOVATION AND AWARENESS

Despite state-of-the-art systems and the ongoing progress on digitalising borders, external border management in the EU still faces several challenges. This digital transformation poses operational difficulties and calls for a change in mindsets of travellers, authorities and other stakeholders involved in international travel.

Collecting travellers' biometric data at the external borders for short-stay journeys and storing them in the EES is new. It is a big change for travellers, especially for those who have never visited countries with a longstanding practice of collecting biometric data. To prepare for this, the EU has developed tools to inform and familiarise travellers on these novelties (informative templates, leaflets and other communication materials as part of the information campaigns, websites, online services).

Experts have also cautioned about the potential increase in waiting times. This is an inevitable yet temporary consequence of any transformation. Waiting times will gradually shorten with the use of automation, introduction of digital solutions allowing different processes to be carried out remotely and acclimatising border guards to the new practices. Traveller behaviour will play a key role during this process; statistics show that people of all ages are increasingly familiar with and open to using new digital tools. Nevertheless, the traveller's capacity to understand and complete the required steps when using automated systems at the borders will have a notable impact on waiting times, as every second counts. Considerably faster process is expected from travellers with previous experience in using similar systems.

In case of ETIAS, we need to find solutions to address the lack of awareness about applying for a travel authorisation, misinformation and the proliferation of unofficial ETIAS websites unlawfully using the EU logo. Next to the Communication Advisory Group – comprising communication experts from the transport industry as well as tourism and travel sectors – and the official EU website (travel-europe.europa.eu), a global communication campaign will be launched a few months before the start of operations of ETIAS addressing myths and clarifying "musts".

When it comes to accepting important changes, the focus needs to be shifted from immediate doubts and concerns to the significant medium-term advantages that are perhaps less obvious at first.

On the document security front, fraudsters and impostors keep coming up with increasingly high-quality counterfeit and forged documents to enter Europe. These developments testify to the importance of digital credentials, relying on uncompromisable digital signatures, as well as the utility of the upcoming interoperability components, including automated fingerprint identification systems and capabilities to detect identities registered in the various databases with both biographic and biometric data.

It is only by ensuring that the guardians of our borders are well-trained in these aspects and equipped with proper tools that they can continue their critical work in ensuring Europe's internal security and the existence of the World's largest area of free movement.

Mikko Hakkarainen works as policy officer, leading the Document Security and Identity Management Team in Directorate-General for Migration and Home Affairs (DG HOME) of the European Commission. His work covers everything from the management of identities in the immigration and travel domain to technical standards on visas, residence permits and travel documents. Mikko has previously worked on policy and regulatory issues on transportation, external borders, visas, legal migration, irregular migration and return as well as large-scale IT systems at national and EU level. Current buzzwords in his daily work include digitalisation, facilitation and security.

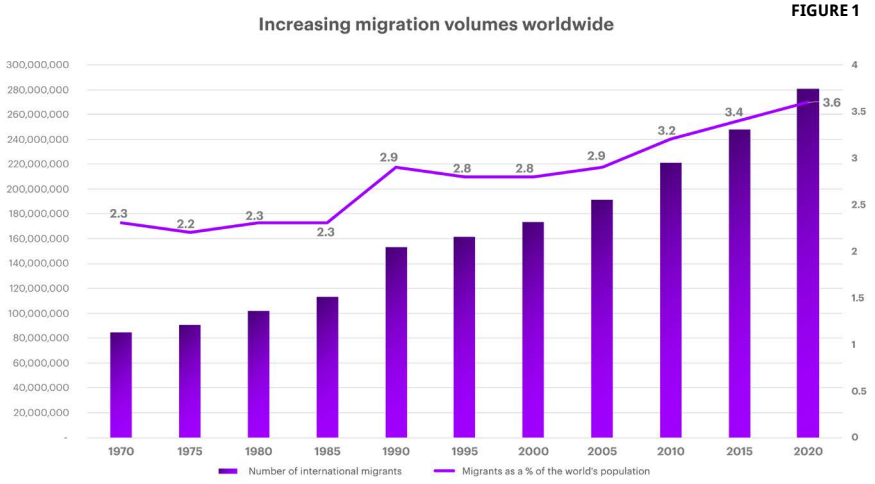
Alexandra-Ioana Andronache is seconded to DG HOME from the Romanian Ministry of Interior and is a former border guard with experience at the external borders of the EU.

By Gerco Landman, Director in Immigration & Borders Transformations at Accenture (left) and Sharif Alqadrie, Border Services Consultant at Accenture (right).

Reimagine better migration processes and experiences.

Migration, a complex and multifaceted global phenomenon, is impacted by various external trends that shape the dynamics of societies and economies worldwide. Understanding and adapting to them is essential for those policymakers, stakeholders and individuals involved in migration processes. In this article, we will outline the key trends shaping migration today, whilst also analysing those that that will have an impact in the future.

FIGURE 1



WHAT IS SHAPING MIGRATION TODAY?

1.Increasing volumes

Migration levels have experienced a steady rise over the past five decades, with over 281 million people currently residing in countries different from their birthplace, according to the World Immigration Report by the United Nations International Organization for Migration (IOM) (Figure 1). Migration is not only growing in absolute numbers but also as a percentage of the world's population, increasing faster than the world's population is growing. While unplanned immigration, often associated with refugee crises, garners significant media attention, many countries view immigration positively, seeing it as a solution to address labor shortages and drive economic growth through the exchange of ideas and innovations. However, managing both planned and unplanned immigration presents complex challenges for government agencies such as the volumes of people, and myriad circumstances leading to migration and work needed to set the new residents up for success in their new communities.

2.Increasing volatility

Migration patterns, once relatively stable, have become increasingly volatile in recent years; particularly in terms of origin, destinations and numbers. The universal access to the internet and social media has accelerated the dissemination of information, leading to much more sudden shifts in migratory patterns than seen in previous decades. This poses challenges for policymakers, public service organizations and stakeholders, necessitating swift adaptation to evolving realities. The unpredictability of migration patterns complicates decision-making processes and requires proactive measures to address emerging challenges effectively.

3. Speed of Technological change

Figure two below shows the trajectory of new technology adoption since the automobile was introduced. One can look at this and easily conclude that many of these technologies have played a significant role in migration trends and processes for the past decades. But the increasing speed at which technology evolves and how migration agencies respond, demands a quicker response. On one hand, technology offers the potential to streamline procedures, enhance efficiency, and improve service delivery. But it also introduces opportunities for nefarious actors to try to defraud public systems such as such as counterfeit documentation and identity theft, all of which are becoming increasingly sophisticated and prevalent. As Canadian Prime Minister Justin Trudeau aptly noted in 2018, "The pace of change has never been this fast, yet it will never be this slow again." In the context of borders and immigration, things are only going to speed up, and it's up to immigration agencies to keep pace to ensure mission success.

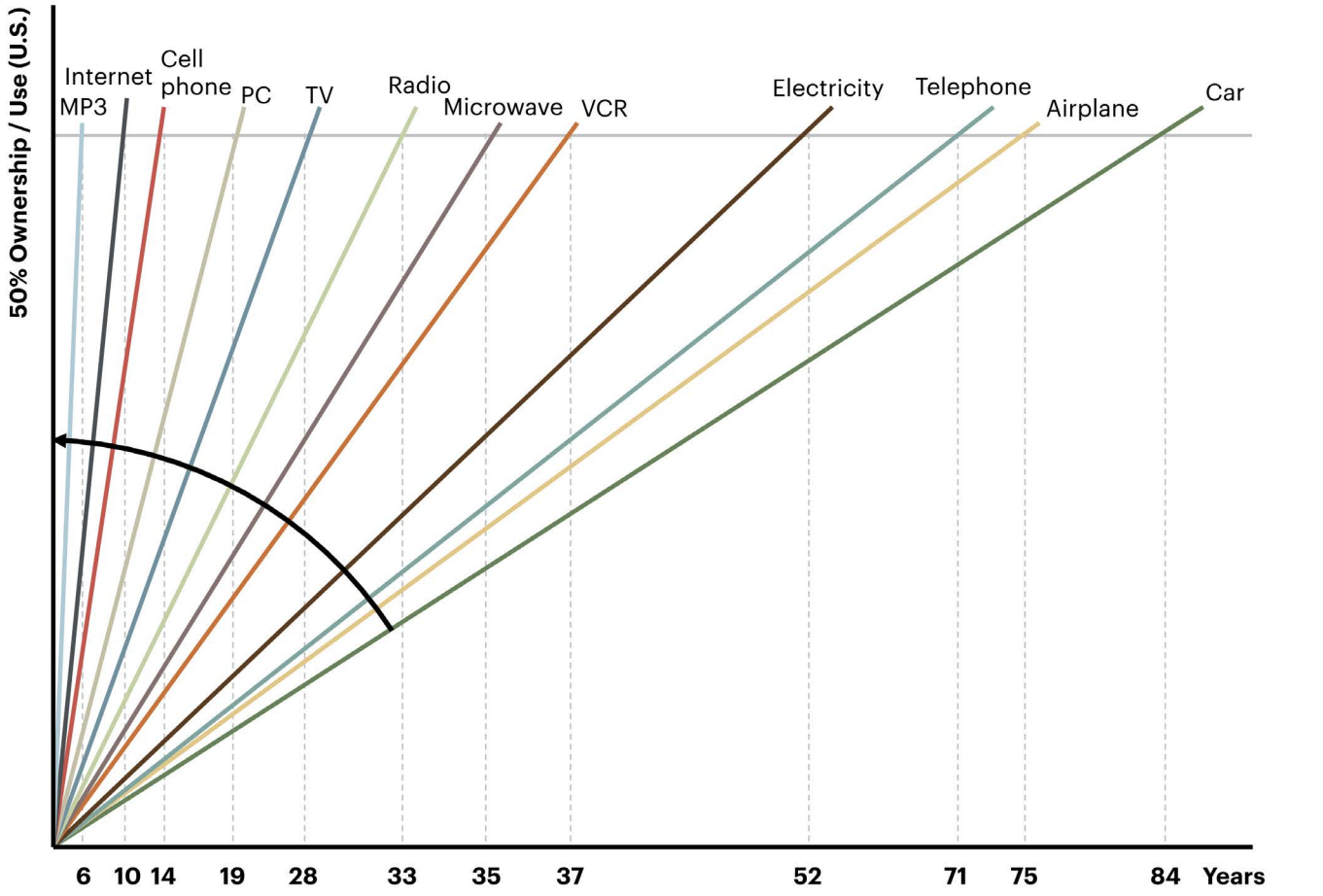


FIGURE 2; SOURCE: WHY ADOPTION OF SOME TECHNOLOGIES IS FASTER? AN EXPLANATION THROUGH SEQUENTIAL COHERENCE

WHAT IS ON THE HORIZON?

Predicting how lifestyle trends might impact migration patterns is not an exact science. However, the annual Accenture Life Trends 2024 helps frame some technological trends and concepts that might impact how and why people move across borders.

1. Life Trend #1: The Great Interface Shift

There is a Great Interface Shift taking place and its intuitive interfaces are revolutionizing internet experiences for citizens and migrants alike, making online interactions more customized and relevant than ever before, moving from transactional to personal. This shift also affects how citizens and migrants want, and are able, to access and consume the information they need to cross borders.

Artificial Intelligence (AI) and Generative AI can benefit both immigrants and government agencies by helping develop new ways to interact and create better experiences. For example, visa

applicants' motivations can be understood more quickly and accurately using AI while border agencies can then shape their offerings and services to make it easier for legal migrants to complete processes to enter their country of choice. This promise of generative AI could be one of the most important developments for public service agencies if thoughtfully and strategically put into practice.

2. Life Trend #2: Decade of Deconstruction

With people living in a more flexible manner, demographics and trends are being upended, signifying the possibility of a decade-long deconstruction of patterns that have previously existed. For years, the correlation between customer experience and revenue growth for the private sector has inspired organizations to hold the customer at the center of every decision. This has driven changes in what citizens expect of their interactions with government.

Yet many areas of the public sector are being faced with the reality of cuts in services, that will be keenly felt by residents at a time when people expect a more seamless, efficient experience like what they get in a consumer setting. Government agencies are being tasked with showing strong returns on program investments.

In this age of budget scrutiny and the need to prove value, border agencies need to think about deconstructing what has been in place for decades and be more selective about the budgets they must spend to improve migrant processes and experiences. Technological advances, coupled with the widespread adoption of remote work, necessitate innovative approaches to support functions that historically required face-to-face contact, such as conducting interviews, processing visa applications and accessing and processing secure data.

For example, a simple tourist visa application should not take four trips to an embassy because of errors in a form. These types of 'old school' approaches should be challenged and reinvented for a smoother, more accurate process that benefits both the applicant and the government entity. People don't want more apps and more touch points; they want touchpoints that make sense — help when it's needed and the right information when it's needed.

WHAT DOES THIS MEAN FOR BORDER AGENCIES?

The continued increase in people moving across borders and the constant evolution of migration trends carries significant implications for border agencies to reinvent how processes like visa applications are streamlined and digitally integrated.

In today's fast-paced world, characterized by diminishing attention spans and evolving information consumption habits, there is a growing demand for streamlined processes and timely information delivery. People no longer have the patience to sift through extensive guidance materials. Instead, they seek purposeful and efficient solutions that cater to their specific needs.

Today, Gen AI agents could facilitate visa application processes by synthesizing case information from various systems, thereby expediting agency personnel decision-making and reducing administrative burdens for both applicants and the agencies. This will remain supporting technology, as ultimately it will have to be the human making the decision.

AI's pervasive influence does underscore the imperative to ensure data accuracy and strike a balance in providing information to humanize the migration experience. As AI continues to reshape work processes and technological interactions, it becomes increasingly crucial to navigate this transformation adeptly. By keeping the human experience at the forefront for both migrants and agency workers and having a responsible strategy toward Gen AI and other emerging technologies border agencies can meet the evolving needs of migrants and facilitate their journey toward a better future in countries rich with opportunities.

Gerco Landman is a global leader in Accenture's Immigration Transformation business. With extensive experience in Digital Identity and Border Transformations, he has successfully led initiatives across Europe, Australia and most recently Canada, ensuring long-term success. Gerco's expertise in driving seamless and efficient immigration processes has contributed to delivering transformative solutions for Borders and Immigration organizations worldwide.

Sharif Alqadrie is a technology consultant for Accenture Global Border Services, specializing in supporting Border Services clients to improve their strategy and operations using the latest technologies. As an industry expert with deep understanding of the border services ecosystem, Sharif is passionate about helping clients on their transformation journeys and building innovative border agencies of the future.

FEATURE

By Agnès Diallo, Executive Director of eu-LISA the EU agency in charge of large-scale IT systems.

How eu-LISA is revolutionising EU border management

EU-LISA HAS EMBARKED ON AN ASPIRATIONAL JOURNEY TO REVOLUTIONISE EU BORDER MANAGEMENT WITH CUTTING-EDGE TECHNOLOGY AND ENHANCED SECURITY MEASURES, CAN YOU TELL US MORE ABOUT WHERE WE ARE COMING FROM AND HOW THESE CHANGES HAVE ARISEN?

Over the past decade, the European Union (EU) has seen a remarkable evolution in border management. We've fully embraced rapid digitisation and cutting-edge technologies, completely reshaping our approach to border security. Our main goal has always been to find that perfect balance between ensuring smooth border crossings within the Schengen area and strengthening security measures to safeguard our region.

Back in 1995, the EU reached a significant milestone by lowering internal borders within the Schengen area. This move ushered in a whole new era of interconnectedness and unrestricted movement across borders. However, it also meant we had to step up our game when it came to external border controls to tackle potential security risks. That's when we implemented various integrated IT systems like the Schengen Information System (SIS), the Visa Information System (VIS), and Eurodac. Each of these systems serves a specific purpose in enhancing security and managing border flows.

To ensure these systems run smoothly, eu-LISA[1], the European Agency for large-scale information systems in the field of justice and home affairs, was set up in 2009. Acting as a central technology operator and advisor for the EU, eu-LISA plays a crucial role in maintaining the delicate balance between security needs and ensuring seamless border crossings. With our headquarters in Tallinn, Estonia, and an operational technical site in Strasbourg, we've put together a team of around 400 specialists from across Europe.

The landscape of border management saw significant changes in the mid-2010s, largely driven by the influx of migrants fleeing the conflict in Syria and heightened security concerns following terrorist attacks. In response, the EU embarked on an ambitious mission to modernise our border management framework. This involved introducing a range of new information systems aimed at boosting security while still ensuring a smooth travel experience for legitimate travellers.

HOW IS THE SMART BORDERS FRAMEWORK REVOLUTIONISING BORDER MANAGEMENT IN THE EU?

The Smart Borders Framework is at the core of this initiative, aiming to revolutionise border management in the EU through four key pillars:

Firstly, the Entry/Exit System (EES) will replace manual passport controls at external borders with a sophisticated digital platform. This system automates the registration of travellers' entry and

1 Discover eu-LISA Core Activities and IT Systems for A Safe Europe: https://www.eulisa.europa.eu/SiteAssets/Discover/default.aspx/home

exit data, enabling the identification of overstayers. By streamlining border controls, enhancing security measures, and modernising operational procedures for both border guards and carriers, EES promises to significantly improve border management efficiency.

Next, the European Travel Information and Authorisation System (ETIAS) operates similarly to systems in the US, Canada, and Australia. It facilitates travel for visa-exempt travellers by conducting pre-travel authorisation checks. By verifying eligibility before travel, ETIAS reduces the risk of travellers being denied entry at border checkpoints. This platform will impact more than 1.4 billion people from over 60 visa-exempt countries worldwide. That's roughly 1 out of every 8 people on the planet!

Thirdly, the ECRIS-TCN System supports judicial cooperation by facilitating cross-border collaboration and information sharing of criminal records for third-country nationals among EU member states.

Lastly, interoperability serves as the cornerstone and most distinctive feature of the EU's border management strategy. This aspect integrates various smart border systems, enhancing their effectiveness through seamless data exchange and cooperation. Leveraging advanced technology, including biometrics and artificial intelligence, interoperability allows for searching through a single interface, expediting biometric matching, recognising multiple identities, and collecting statistics. Ultimately, this simplifies the daily tasks of border guards, immigration officers, and law enforcement personnel.

EES HAS BEEN IN DEVELOPMENT FOR SEVERAL YEARS. HOW DID YOU MANAGE TO REACH THE FINAL STAGE OF DEVELOPMENT? HOW DID THE AGENCY SUCCESSFULLY MANAGE TO ACHIEVE ITS TURN AROUND?

It is true that the development of the Entry/Exit System (EES) stalled at the end of 2022, leading to successive delays in its delivery. To address the situation, in 2023, we implemented a new strategy known as the 3Rs – Remobilising suppliers, Resolving elements of implementation complexity, and Renewing working methods within the Agency in a more horizontal and agile way – to kickstart progress. This strategy was all about breaking the deadlock and preparing a fully functional release for Member States to put to the test. It has produced its first results during 2023, allowing for advanced versions of the system delivered to Member States so they could progress with their preparations. This rebuilt the trust both internally and with our stakeholders.

COULD YOU EXPLAIN THE INTEROPERABILITY ROADMAP AND HOW IT MAPS THE WAVES OF DEPLOYMENT?

Well, on the basis of these successes, eu-LISA put forward a new roadmap for advanced border management systems, that was unanimously adopted by our all our Governance bodies and validated by the Justice and Home Affairs (JHA) Council in October 2023.

It lays out the journey ahead in a really clear way, split into waves of implementation. The idea behind this roadmap is to get these systems up and running quicker so that people can start benefitting from them sooner.

The first wave, set to be finished by the end of 2024, focuses on rolling out the Entry/Exit System (EES), a first level of the common biometric system, and web services for operators. Then, hot on its heels, the second wave aims to deliver ETIAS by mid-2025. And then there's the third wave, which is about strengthening judicial cooperation by implementing the ECRIS-TCN system.

Finally, by the end of 2026, all the remaining components of interoperability will come together. That's going to really boost the efficiency of the entire border management framework and bring some serious value to professionals, allowing border guards to replace repetitive tasks by higher value tasks such as risk analysis, and EU citizens by providing better services through a more seamless journey and faster border crossing.

Since then, eu-LISA has been making significant strides in developing the EES. By the end of January 2024, the Agency had delivered a fully functional release with all the necessary functionalities to Member States for compliance testing with their national systems and for a comprehensive end-to-end evaluation.

In January, the Agency also launched the test environment for the web service with carriers after rigorous security testing.

Highlighting the momentum and credibility of these ongoing developments, the analogy of a departing train aptly captures the progress made so far. With three fully operational test versions delivered since the summer, Member States, providers and carriers are actively engaged in testing the systems, training users, such as border guards, refining and finalising the systems before the summer.

As the journey progresses, our commitment to seamless border management remains steadfast, with the ultimate aim of enhancing the security of the Schengen area, improving the efficiency of border guards' work, and ensuring a smoother travel experience for passengers entering the Schengen area. The European Commission has announced plans for Entry into Operation by the end of 2024.

WHY IT IS IMPORTANT TO PREPARE AND WHAT IS AVAILABLE TO HELP YOU?

Certainly, the journey towards implementation comes with its set of hurdles. It's absolutely crucial for EU Member States, carriers, and operators to collaborate closely to ensure these systems are deployed on time and function smoothly. This means everything from adjusting infrastructure and equipment to training staff and reconfiguring business processes and passenger flows. It's going to take a united effort to fully realise the potential of these game-changing initiatives.

To ease this transition, both the EU institutions and eu-LISA are actively involved in providing support and guidance to Member States and carriers. They're rolling out training programmes, setting up testing environments, and launching communication campaigns to ensure everyone is well-prepared for the upcoming changes. Looking ahead, there are even more innovations in the pipeline, including the future EU digital visa portal and the digitalisation of travel documents. These developments underscore the ongoing commitment to innovation and ensuring seamless travel experiences at the EU level.

WHAT IS THE IMPACT OF THE DEVELOPMENT OF THE EES AND ETIAS ON EU BORDER MANAGEMENT AND SCHENGEN TRAVEL AND SECURITY DEVELOPMENTS?

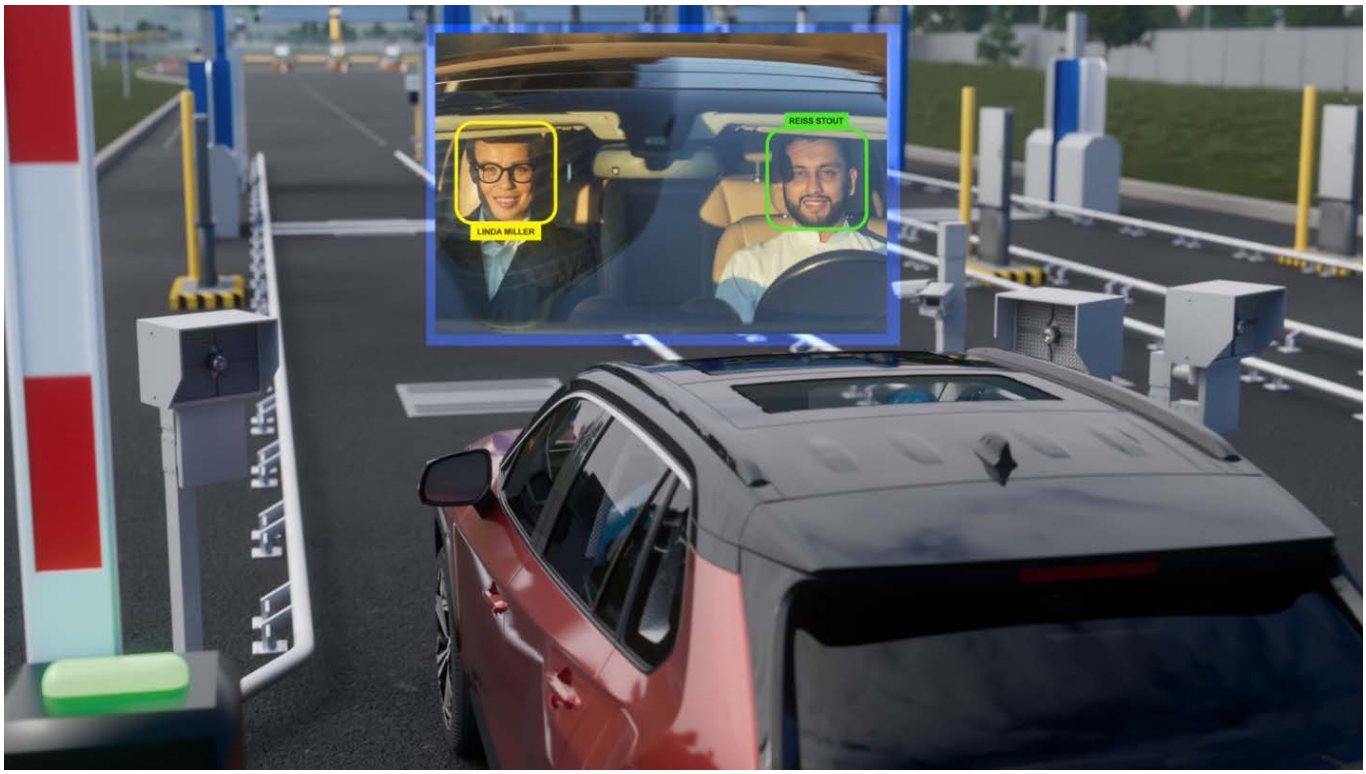
The ongoing development of the Entry/Exit System (EES) and European Travel Information and Authorisation System (ETIAS) marks a significant turning point in border management, offering a host of advantages for all involved parties. Travellers stand to gain from simplified pre-travel authorisation processes and quicker border crossings. Meanwhile, carriers will benefit from access to up-to-date information via user-friendly digital tools, and border control authorities can bolster security measures and streamline passenger flows. Moreover, ports and airports now have a unique opportunity to modernise border controls, strengthen security screenings, and enhance the overall passenger experience.

The evolution of border management within the European Union is now at a pivotal stage, poised to reshape the future of travel and security within the Schengen area. Moving forward, eu-LISA remains fully dedicated to realising the European vision of seamless and secure borders. With robust cooperation and strategic preparedness, we are well-equipped to navigate this transformative landscape and usher in a new era of unparalleled excellence in border management.

Agnès Diallo has over 20 years of experience supporting government-level institutions and private sector organisations in France and across Europe in the areas of digital identity, data protection, security, as well as business transformation.

By Jon Payne, Director, Government Relations, Entrust.

The Nonstop Vehicle Border Has Arrived



At the end of 2021, in our first in-person meeting after the COVID-19 pandemic, many of us in the IBMATA family gathered in Brussels for a pre-conference workshop with an intriguing question: Drive Through Borders: Fiction or Reality? The conclusions from that session appear in BMT Issue #7 (December 2021).

The workshop was full of thorny questions but also real optimism that, between us, the border management community could deliver a vision we've talked about for years: nonstop, drive-through lanes at land or maritime vehicle borders that are smart and secure enough to clear most passengers automatically, referring a minority of exceptional cases for in-person scrutiny.

We talked about pre-travel identity checks, policy around eligibility for automated lanes, making space for new infrastructure, the use and reuse of digital travel credentials, and legal restrictions around admissibility decisions being made by humans versus machines.

Two and half years and a lot of work later, we're on the verge of turning this concept into reality. Both US CBP and UK Border Force, to name just two examples, have talked publicly about their interest in these solutions. And many of us in the technology community have been working hard to put together offerings that meet the needs of these and other countries.

TEAMING FOR SUCCESS

We at Entrust have a market-leading remote biometric registration capability called Identity Verification as a Service (IDVaaS) that is already used by the UK Home Office, for example, to support their EU Settlement Scheme, Generic Identity Verification and Electronic Travel Authorization programs.

When used in a seamless travel setting (such as our integration within the Eurostar SmartCheck system), IDVaaS also allows passengers to derive a Digital Travel Credential from their passport and store it securely in their mobile device for future use, meaning that they don't need to repeat the identity verification process for each journey.

But these are only the first steps in what's required.

To start building out the nonstop vehicle border, we partnered with Gatekeeper Intelligent Security, fellow IBMATA member, now part of Rapiscan, and the market leader in secure, automated vehicle lanes for both security and border use cases. Their Intelligent Vehicle Occupant Detection (IVOD) system provides highly accurate, through-windshield biometric face matching that operates in any weather.

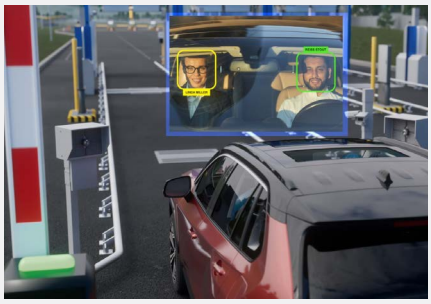
Gatekeeper technology is also capable of recognizing vehicle types and reading license plates, which allows for the possibility of binding driver and passenger identities to a particular vehicle that can be declared in advance, at the time of registration.

During integration and testing between the Entrust and Gatekeeper capabilities, we realized that a piece was missing. What we had built worked well for private cars, but not for buses and coaches. In discussions with border agencies in different countries, there was a clear focus on ensuring that nonstop lanes could accommodate coach parties as well as private cars.

What if we could emulate airlines by checking coach passengers' identity and credentials at the time of boarding? Another IBMATA member, Mobile Edge, offered an answer: its EdgeSecurity system links coach manifests with pre-enrolled identity data, allowing a coach driver to check passengers in easily and quickly on a tablet or mobile phone (or even via smart glasses), while they board the bus, thus avoiding the need for passengers to disembark at a border crossing point.

A SOLUTION READY FOR PRIME TIME

The system we've now developed is built around these three key elements:

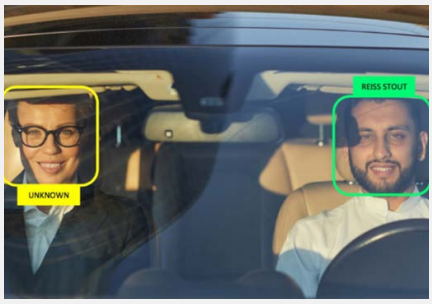


1. REMOTE IDENTITY AND TRAVEL DOCUMENT PRE-REGISTRATION AND VERIFICATION

Entrust's Identity as a Service (IDVaaS) solution creates a trusted identity with an optional, multi-use, Digital Travel Credential (DTC), ensuring the verified identity of each individual before travel.

2. ADVANCED RISK ASSESSMENT, REAL TIME COACH AND PASSENGER VERIFICATION AND TRAVEL STATUS

Mobile Edge's EdgeSecurity solution links coach manifests with biometric pre-enrollment, enhancing operational efficiency, planning and security by providing upstream information and removing the need for passengers to leave the vehicle.



3. A SEAMLESS BIOMETRIC LANE, FOR ALL VEHICLE TYPES, INCLUDING BOTH TOURISM AND TRADE

Gatekeeper's Intelligent License Plate Analytics (ILPA), Intelligent Vehicle Classification Analytics (IVCA) and Intelligent Vehicle Occupant Detection (IVOD) technology integrates with biometric pre-registration to facilitate a nonstop border crossing point for most eligible passengers.

This team was proud to contribute in 2023 to the UK Border Force maritime proof of concept testing at the Port of Ramsgate. That process enabled us to demonstrate that the solution works well in real-world conditions, as did our earlier work with Gatekeeper for the land border element of the Chain of Trust project with Canada Border Services Agency. Both projects provided valuable feedback about where iterative improvements needed to be made.

We look forward to contributing to the next stage of the UK Border Force process, and to demonstrating the solution not just to other governments, but also to ports and transport operators wrestling with similar issues.

TOWARDS INTEROPERABILITY

It's an exciting time to be working on seamless travel. Concepts that have been merely ideas for years are now being put into practice. The UK is rolling out its biometrically secured ETA system, the US is adding biometric capabilities to its ESTA program, and ICAO-compliant digital travel credentials are being piloted in Croatia and Finland. In Sweden, the European Union will soon test an app designed to allow pre-registration into its forthcoming Entry-Exit System (EES).

Given all this innovation and piloting, it's no surprise that interoperability has become the new buzzword. In an interview with a technology magazine recently, the journalist asked me if all this activity isn't more confusing for passengers. This is a good question. If we simply replace paper-based confusion with digital confusion, the traveling public are not likely to feel that their journey is any more seamless than it was before.

This is why interoperability is so important. And it's why Entrust, Gatekeeper and Mobile Edge have built a solution that's based on digital travel credentials derived from passengers' ePassports.

There is no point creating innovative pilots if they don't have the potential both to meet international border management standards and ultimately to link up with other innovations happening elsewhere. The best way to achieve that is to avoid proprietary credentials and stick to international standards.

LET'S NOT FORGET ABOUT LAND AND SEA BORDERS

Another way to think about interoperability is across transport modes. The traveling public will not thank us if we achieve seamless air travel, only to require a completely different set of rules and processes when crossing land and sea borders. This is just another recipe for confusion.

The ongoing work we're doing with Gatekeeper and Mobile Edge demonstrates that the nonstop vehicle border – on both land and sea – is rapidly becoming a reality.

Jon Payne is Director, Government Relations at Entrust. He joined Entrust in 2021 via the acquisition of WorldReach Software. Jon has more than 25 years' experience in immigration policy and operations, having served at the UK Home Office as Regional Director, Americas (UKvisas) and Chief of Staff (UK Border Agency). He also served as Deputy Head of Mission at the British Embassy in Kabul, Afghanistan, and as Director of CSC's Global Citizen Services Center of Excellence.

FEATURE

By Jeff Goldfinger,
President of Xtra Mile
Training and Development

AI – It's Time to Get a Little Loopy

At both WCO Tech (Hanoi) and IBMATA (Prague), many of the speakers and panelists talked or answered questions about the role of artificial intelligence (AI) in frontline operations.

"When will AI replace customs inspectors?" seemed to be the most pressing question as a result of an unprecedented confluence of world events:

- Politicians and regulators mandating 100% cargo inspection and individual identification rates.
- Growth of illicit cargo and tariff avoidance schemes.
- Masses of human migration from trafficking and / or refugee crises.
- Paucity of qualified applicants.

Interestingly, there was wide disparity among the educated answers. The most optimistic opinion was that AI is already here and can serve in some meaningful ways – examples

include risk analysis and imagery interpretation. By contrast, several speakers reminded the audience that fully semantic AI, like ChatGPT's natural language processor or Tesla's full self-driving neural network video processor (aka v12), are many years away from replacing front line agents.

I am certainly not qualified to even remotely guess "when" semantic AI will happen. Rather, I want to focus on the "what and how" to describe it. To be most efficient in conversations between buyers (government agencies) and sellers (equipment manufactures and service providers), I suggest we adopt two specific linguistic conventions.

Before I reveal them, it is important that we all share a common understanding of the role that humans play when interacting with technology.

The phrase "feedback loop" is used in a large variety of disciplines. In biology, animals, including us humans, have feedback loops that keep heart rates, breathing, and hormones at more or less normal levels – what is referred to as homeostasis. In astronomy, feedback loops are used to constantly monitor atmospheric turbulence to provide instantaneous corrections to adjustable optics. Electrical circuits are designed with feedback loops to keep equipment operating within normal ranges. In business, analyzing customer buying habits and social media comments provide feedback to improve existing products or drive new development. In finance, fund managers use feedback loops to keep their portfolios appropriately balanced.

Some feedback loops necessitate the presence of a human operator. Riding a bicycle requires one to constantly judge the balance of the bike so as not to fall over. When the bike leans left, the operator leans right. When first learning this skill, our feedback loops aren't mature enough, resulting in jerky movements, over correcting,

and the occasional collision with terra firma (or worse). Driving a car, piloting an airplane, performing surgery are all examples of activities that today mandate the presence of a human operator as part of the feedback loop.

This is what we call human-in-the-loop (HITL) operations – the first of the two terms I'm introducing here.

In the border security domain, manual cargo inspections and imagery analysis are a form of HITL operations.

You are likely aware that nearly all modern commercial airplanes have autopilots that relieve the pilot of HITL-style flying. The technology of flight management systems (FMS) has reached such a level of sophistication that many models can taxi, takeoff, cruise, land, and even shutdown with the push of just a single button. This is definitely the case for several models of unmanned aircraft (aka drones) like Northrop Grumman's Global Hawk. For vehicles, there are many consumer-produced videos online demonstrating how a Tesla with FSD v12 software can drive point-to-point without any intervention from the human operator.

In both cases, regulators and the public still require a human to monitor the performance of the aircraft or vehicle and takeover control in the event of an anomalous situation. As an instrument rated, commercial pilot myself, I often describe to non-pilots that my role onboard is not meant to handle the routine but rather to handle emergencies since there hasn't yet been invented the autopilot that can autonomously handle a "Sully" Sullenberger's "Miracle on the Hudson" situation (ditching a fully loaded commercial airplane in New York's Hudson River after a dual-engine flameout without a single loss of life).

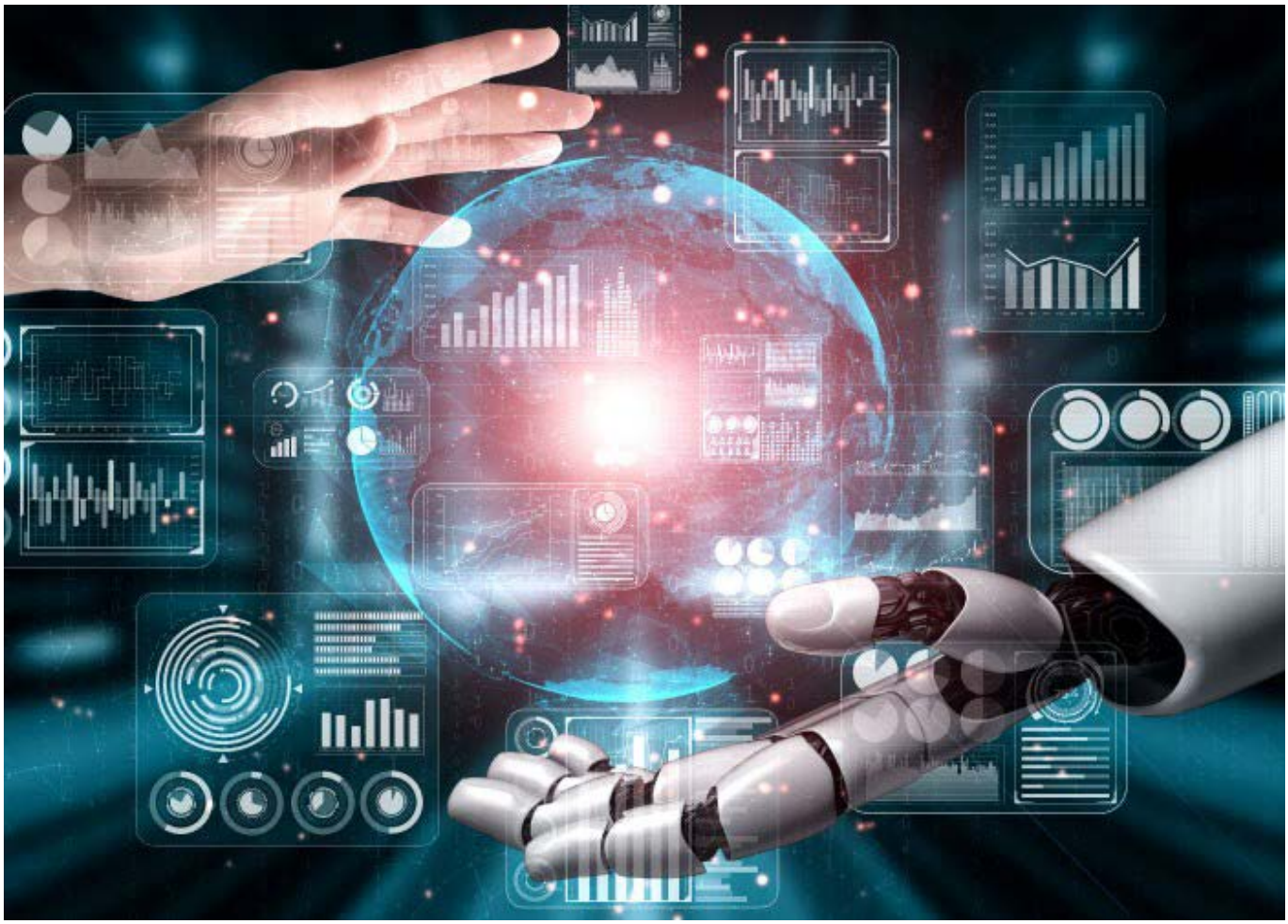
When the feedback loop is overloaded or incapable of autonomous response, the human must intervene.

This is what we call human-on-the-loop (HOTL) operations – the second new distinction.

As technology gets more mature, more and more activities, including border security operations, have or will transition from human-in-the-loop (HITL) to human-on-the-loop (HOTL).

HOTL is often far more efficient since the humans can now perform other, more intellectually noble tasks. Imagine a future where instead of two pilots flying onboard a single jetliner, a single HOTL pilot at a ground control station can monitor the flights of two or more aircraft. This is the dream of nearly every airline CEO as it will significantly reduce labor costs.

This is the exact situation we're facing in border security operations. Can we convert some highly HITL tasks to a more operationally efficient HOTL environment? I submit that



examples can already been found. By incorporating S2 Global's CertScan software with HOTL features, the Port of Authority in Puerto Rico implemented a 100% NII inspection program that increased Customs compliance and virtually eliminated smuggling through the Port of San Juan.

I submit then, instead of asking manufacturers the question posed above, "When will your AI replace my customs inspectors?" you should be asking: "How can your AI solution help me transition from HITL to HOTL?"

To reinforce this point, let me cite two quite absurd examples of failing to adhere to the HOTL principle.

The first is merely embarrassing. It involves the case of Steven A. Schwartz, Esquire, who, in May 2023, used ChatGPT in a personal injury lawsuit on behalf of his client but failed to HOTL-check the output which included several non-existent court cases as precedent. Contrast that with the financially devastating "flash crashes" of stock markets due to HOTL-less trading algorithms running wild.

As the title of this article recommends, stay "loopy" my friends – HITL or HOTL as you see fit.

Jeff Goldfinger is the president of Xtra Mile Training and Development, a U. S. Veteran-Owned Small Business in the defense and security sector. Prior to starting his company, he held roles in military flight operations and training, program management and procurement followed by industry roles in program management, capture management, business development, and business unit leadership. He has a B.S. in Computer Science and an M.S. in Higher Education.

FEATURE

By Farid Moussa,
Vice President of Strategy and
Public Sector, Babel Street

Closing the Risk-Confidence Gap:

Harnessing the Power of Open-Source Intelligence and AI-Powered Name Matching to Aid Decision-Making at the Border

Unsafe borders endanger citizens and stifle economic growth; failure simply isn't an option. Border security professionals need to make rapid decisions at points of entry to disrupt the flow of illegal goods and immigration, but dated technology and information overload hinders these efforts.

Experts have predicted that by 2025 over 463 exabytes of data will be generated each day globally. Not only are we seeing exponential growth in the volume of data, we are also experiencing growth in the veracity and the variety of data. With digital data growing exponentially, border security professionals need better and faster ways to separate the meaningful from the meaningless.

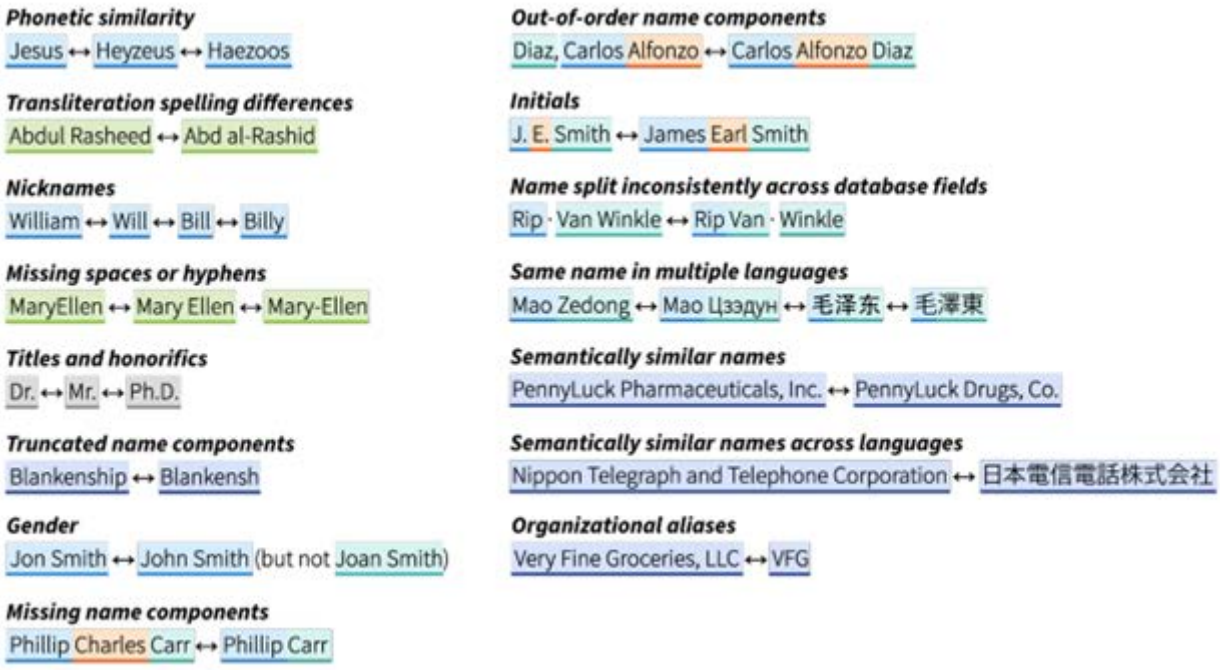
With the dark web, by design every user is attempting to obfuscate their identity, and bad actors are hiding much better. This presents a cat and mouse game wherein the cat must be smarter than the mouse, but the mouse is continually getting smarter.

Multilingual data poses additional challenges for detecting and preventing terrorism, transnational crime, cybercrime, intellectual property theft, and counterfeit goods — all of which threaten global and national security and economic vitality.

This is presenting a concerning Risk-Confidence Gap — a widening chasm between the escalating volume and variety of data that must be examined to obtain insight and identify threats, and the resources available to analyze that data. Agencies have no way to confidently and efficiently parse the volume and variety of data — in different languages and scripts — for issues and threats.

Moreover, there's a need to minimize the high cognitive burden inherent in identity verification and remove repetitive and rote tasks.

As a result, we are increasingly seeing the need for open source intelligence (OSINT), enhanced with artificial intelligence (AI) and natural language processing (NLP) for improved threat intelligence decision-making for border screening.



NAME MATCHING, USING AI, ANALYZES MULTIPLE CONTEXTUAL DATA POINTS ACROSS LANGUAGES TO ARRIVE AT MATCHES.

OPEN SOURCE INTELLIGENCE – UNLEASHING THE POWER OF UNCLASSIFIED DATA

While intelligence has traditionally been based on classified data, today, unclassified data is increasingly being used to provide context for other types of intelligence. Open source intelligence is collected by searching on topics or entities of interest that are publicly available on the internet at large.

In the past, OSINT has been seen as a "lesser form" of intelligence since it is unclassified. However, the view of the value of OSINT has changed dramatically over the past few years. SIGINT and HUMINT are the most expensive forms of intelligence, however OSINT is far more cost-effective. It's also becoming invaluable to support a key imperative: international communication and collaboration which is necessary to secure and reinforce borders for global trade and travel.

WHAT'S IN A NAME? CHALLENGES AND COMPLEXITIES ABOUND

Border control involves the scanning and matching of millions of names a day to secure borders and facilitate lawful international trade and travel, while enforcing laws and regulations.

Verifying identity has been an ongoing challenge for intelligence analysis due to the vast complexity of linguistics, spelling and cultural variances, human error, as well as human evasion.

It's tempting to think that name matching is like doing a keyword search, except the complexity of language makes it more challenging. New names are constantly created, with multiple spellings and no set of rules to encompass how names are formed. They are variable across languages, scripts, cultures, and ethnicities. Culturally-specific nicknames and aliases add to the complexity.

Some older name matching systems use a "brute force" approach, generating all possible spelling variations to increase possible matches. This approach has weaknesses, such as dealing with not-yet-seen names and names with added or missing spaces.

Compounding this issue is the fact that more data than ever before is being published and posted in languages other than English. To this end, border security professionals must have linguistic capabilities that span hundreds of languages. Best-of-breed natural language processing capabilities run against the data while it is still in its native language. This minimizes the occurrence of analytic errors caused by inaccurate machine translations.

NLP recognizes the richness and variety of words and names in multiple languages and scripts, and their use across cultures. Using machine learning (ML) and linguistics algorithms, the technology simultaneously considers numerous types of name variations.

NLP and AI algorithms are employed to enhance datasets

for greater quality, usability, and completeness. Unstructured and relationship data are visualized through advanced link analysis, geographic heat maps, influential entity carousels, topic clouds, and patterns by time and day.

These advanced algorithms accurately score and prioritize critical entities within a relationship network while providing the citations from which an AI/ML-based decision is made. The technology has matured such that today, world-class entity matching technology measures over 100 features to calculate the similarity of entities across multiple languages.

TECHNOLOGY AS A FORCE-MULTIPLIER FOR MODERN BORDER MANAGEMENT

Modern border management cannot continue to rely on traditional tactics in today's vast digital landscape. We cannot "hire" our way out of this problem. Instead, it is imperative that we adopt technology to scale our efforts and free humans to solve the harder problems that machines cannot solve.

OSINT with AI and NLP is a critical force-multiplier; the technology can efficiently analyze massive volumes of data and distill actionable information, enabling analysis at speed and scale beyond human capacity. This is helping border security professionals overcome the Risk-Confidence Gap, while allowing humans to focus on the more difficult problems and/or vetting the results of AI.

Advances in technology are making it possible to streamline and scale cross-border screening prior to and during entry, while incorporating multilingual publicly available information and text analytics for enhanced decision making. With these technologies, border control professionals can put in place consistent, repeatable processes for automatically screening entities against public records, watchlists, social media presence, and other factors, that reduce the risk of human error and missed threats. As well, they can speed processing and reduce false positives, so as not to impede border crossing of legitimate trade and transit.

Farid Moussa is Babel Street's Vice President of Strategy and Public Sector. Prior to joining Babel Street, Farid retired from the National Security Agency as a member of the Senior Executive Service cadre. In his last position with the government, he led the Video, Image, Speech, and Text Analytics (VISTA) effort. Having guided language analysis teams for the counterterrorism target set in the post-9/11 era, he developed a deep appreciation for human language technology and its role in prosecuting the mission. Over the past 15 years, he drove the development of several VISTA service capabilities, empowering over 10,000 analysts within the U.S. Intelligence Community. Farid was a two-time keynote speaker at the Massachusetts Institute of Technology / Lincoln Lab biannual Human Language Technology Applications conference. He is a recipient of the Presidential Rank Award of Distinguished Rank.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INTERNATIONAL BORDER MANAGEMENT
AND TECHNOLOGIES ASSOCIATION
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By Veiko Kommusaar,
head of Estonian Border Guard

Guarding the European Border

Estonia regained its independence from Soviet occupation almost 33 years ago. After the collapse of the Soviet Union a big part of Europe lived for decades under the assumption that the Cold War is over and Russia can be seen as a partner to the European countries. People who hoped that the fall of the Berlin Wall meant the end of history were wrong.

For decades, Eastern European countries have been cautioning Western Europe about Russia's unchanged ambitions and its efforts to destabilize neighboring societies. Unfortunately, these warnings went largely unheeded, leading to Russia's aggression, such as the attacks on Georgia in 2008 and the annexation of Crimea in 2014. This allowed Russia to attack Georgia in 2008 and annex Crimea in 2014.

The final wake up call for Europe was Russia's full-scale military assault launched on Ukraine in February, 2022. This day the war started – 24th of February – holds great significance to every Estonian – it is the Estonian Independence Day.

Estonian-Russian border is about 330 kilometers long. About 130 kilometers of it runs on land and the rest on lakes and rivers. The land border with Russia has three border control points. About 75% of the people crossing the Estonian-Russian border do it at Narva – a border city that was bombed to ground by the Soviet forces during World War II – in north-eastern Estonia. The rest of the 25% people crossing the border are divided equally between our other two border control points in south-eastern Estonia.

Today the total number of people crossing the Estonian-Russian border is about 40% of what it was before the covid19 pandemic, that brought along a lot of travel restrictions.

Although Estonian intelligence agencies have warned for years about Russian efforts to use the Estonian-Russian border area for all manner of unfriendly activities, the border guard used to prioritize adding convenience to the people crossing the border and solving conventional problems one might expect to counter at borders – preventing illegal border crossings and cross-border crime.

While Estonian intelligence and defense authorities did not have any illusions about the intentions of Russia, the final wake-up call for the society came in 2014 when an Estonian counter-intelligence officer was kidnapped from Estonian territory by Russian Federal Security Service (FSB) agents.

FSB is a successor agency of the infamous KGB and Russian border guard is part of it. Because of that the aim of Russian border guard is not to work together with us to deter cross border criminal activities, but rather use the border as an operational area to further their efforts in destabilizing the societies of their neighbors. For that they cannot be considered our partners but rather we have to view them as a liability.

In the recent times the main challenge of the countries in our region is combating illegal migration that is orchestrated by Russia.

For the past years Russia and its puppet state Belarus has flown in people from Africa and Middle East to then direct those people towards the borders of Latvia, Lithuania and Poland. At the end of last year, a similar campaign was launched against Finland. This forced Finland to temporarily shut down its border control points with Russia. Recently they extended the closing of the border control points indefinitely.

At the end of last year small groups on illegal migrants were directed to the Estonian Narva border control point by Russian border guards as well. Estonia denied entry for them and prepared all our border control points to be able to immediately close them should the situation take a turn for worse.

After the end of last year Russian border guards have not used instrumentalized migration against Estonia, but the fact, that it has not happened, does not mean, that the threat of it is not present. The people that Russia sent towards Finnish border control points are still in Russia meaning that the only thing needed to start directing these people toward Estonian or any other NATO/EU member state border is the will to do so.

While we'd like to focus our efforts to improving the customer experience at our border control points so that people entering or exiting Estonia could do so fast, smoothly and comfortably, we don't have the luxury to do so on our eastern border. On our border with Russia our focus is – and it will be so for the foreseeable future – to ensure that we have our eyes and ears everywhere on the border.

We are currently modernizing our entire eastern border. Our land

border with Russia has ran for years through forests and swamps and was marked only with border posts. By the end of next year, it will be entirely fenced up. In addition to the fence we are constructing new patrol roads next to it, renovating old and building new access roads to the border and making all the necessary preparations that we can add electronic surveillance equipment to the entire land border.

Currently about half of the border infrastructure on our land border is already completed. We are working on building the next half and at the same time are adding electronic equipment on the part of the border that is already done. In addition to setting up electronic surveillance equipment on our land border we are also working to cover our entire river border with electronic surveillance. The part of the border running through in the middle of lake Peipus – the largest border lake in Europe – is already covered with necessary equipment.

One is right to ask us if our push towards equipping our border with the most modern technology is enough to keep our borders secure. The answer to that question is short – no, not in the slightest.

The equipment is there to delay people intending to cross into Europe without proper documentation. However modern the infrastructure, at the end of the day the cameras, sensors, radars and the razor wire are there to give the people guarding the border enough time to react and get to the border in time to stop any illegal activities.

The cornerstone of guarding a border is a skilled and experienced border guard – the men and women who know every meter of the border and the area surrounding it. We are lucky to have such people and because of the times we are encouraging the people working in border control points to transfer to the border guard stations to have even more people available guarding the border between our border control points.

Estonian-Russian border is not only the border of Estonia but also the border of Europe. Estonian border guards have participated in numerous border guarding missions at different parts of Europe and we are always happy to welcome the border guard units of our allies in Estonia. Guarding Europe's border is our mutual responsibility and the importance of sharing best practices and working together cannot be understated.

While we would like to invest into technologies that help people cross our borders more easily, for the foreseeable future this is will not be a priority. All our efforts are directed towards securing that only people who are allowed into European Union can cross the European-Russian border.

Veiko Kommusaar has over 20 years of experience in law enforcement. His public administration career commenced in 1999 as a specialist at Estonian Citizenship and Migration Board, progressing to the position of Head of Unit at the North Prefecture, Estonian Police Board.

By Johanna Morley,
INTERPOL

Enhancing border security: INTERPOL's crucial role and technological advancements

In today's interconnected world, effective border management is paramount for safeguarding national security and combating transnational crime. At the forefront of this endeavour stands INTERPOL, serving as a cornerstone for international police cooperation and support for law enforcement agencies globally. The Vienna Declaration of 2023, released on the centenary anniversary of INTERPOL's foundation, outlined five priority actions:

1. Elevating transnational organized crime as a global national security priority.
2. Fostering greater cooperation to combat criminal activities.
3. Facilitating increased information sharing.
4. Empowering frontline law enforcement personnel.
5. Promoting investment in innovation and technology.

Progress in these priority actions is essential in combating crimes across four global areas that INTERPOL considers the most pressing today: terrorism; cybercrime; organized crime; financial crime and anti-corruption. When it comes to organized crime, typically, structured criminal syndicates engage in a wide array of illicit activities across various nations and borders. These pursuits encompass human trafficking, narcotics distribution, smuggling of contraband, arms trafficking, and financial fraud. With earnings reaching into the billions, their illicit ventures bear striking similarities to legitimate multinational corporations. They adopt operational frameworks, strategic planning, and hierarchical structures, all geared towards maximizing profits while minimizing exposure to risk.

The fifth priority action, investing in technology and innovation, is especially important when it comes to enhancing border security. As criminal tactics evolve, law enforcement must adapt and anticipate by harnessing advanced tools and methodologies to effectively combat these threats. Partnering with private sector companies is essential as

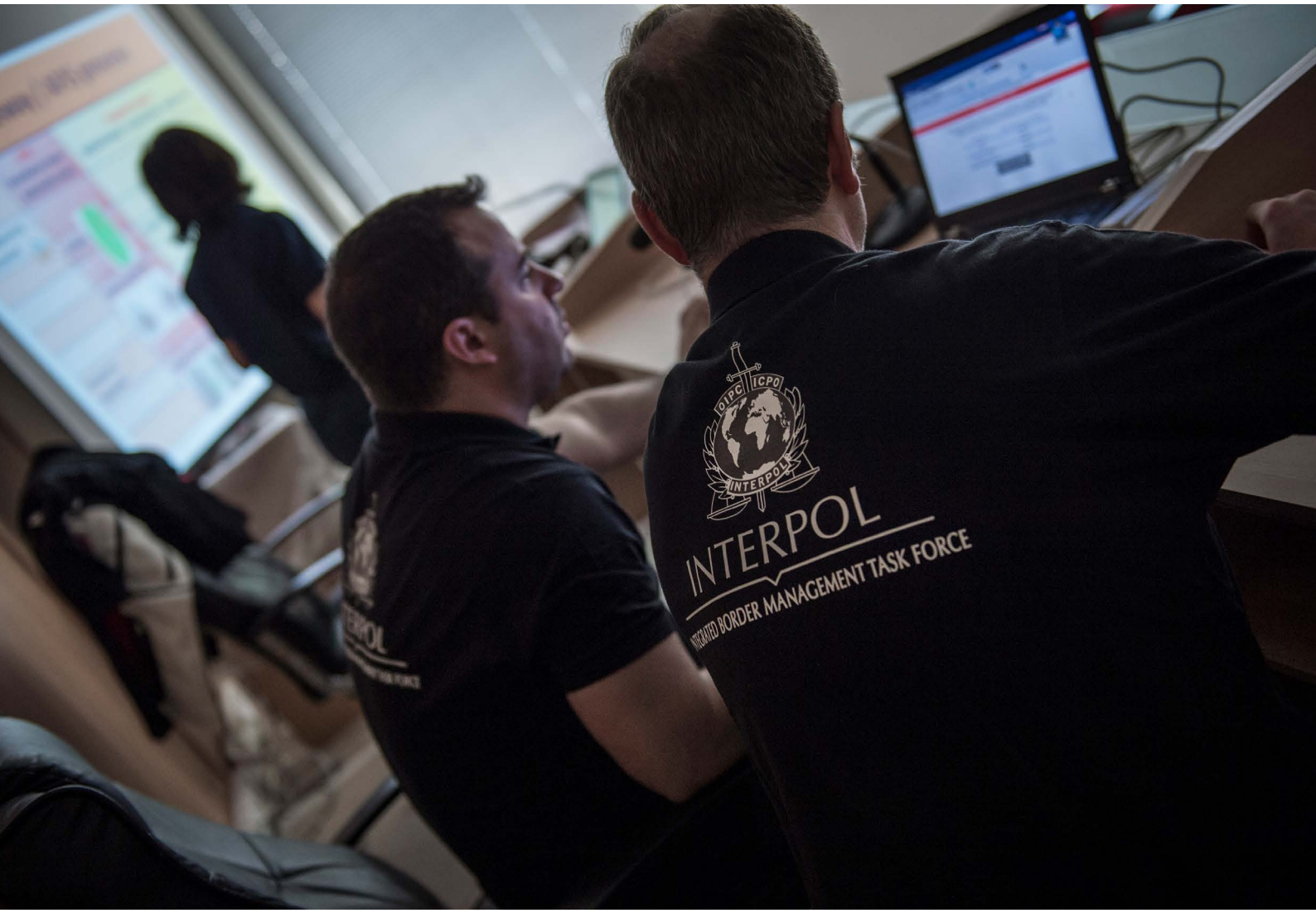
they often possess cutting-edge technologies, such as artificial intelligence, predictive analytics, and biometric identification systems, which significantly enhance their capabilities in crime prevention, detection, and investigation. Ultimately, investing in technology and partnering with the private sector are crucial steps towards creating safer communities and ensuring the security of society as a whole.

BORDER MANAGEMENT CHALLENGES

Despite technological advancements, border management presents myriad challenges that necessitate continuous attention and innovative solutions. Mass migration, in particular, poses significant humanitarian and security concerns, placing immense strain on resources and infrastructure while creating opportunities for exploitation by transnational criminal organizations. The influx of migrants often overwhelms border authorities, making it difficult to screen individuals effectively and detect illicit activities such as human trafficking and smuggling. Moreover, the presence of undocumented persons within border regions further complicates efforts to maintain integrity and security. These challenges underscore the critical need for comprehensive and adaptable border management strategies that prioritize the protection of vulnerable populations while effectively addressing security threats. International cooperation and coordination are crucial in tackling these complex issues, as they transcend national borders and require collective action to ensure the safety and well-being of communities worldwide.

INTERPOL'S BORDER MANAGEMENT CAPABILITIES

INTERPOL boasts a rich array of resources and capabilities, including 19 databases that serve as indispensable tools for law



enforcement agencies worldwide. With the escalating mobility of people and goods across borders, including the movement of criminals, ensuring the safety of citizens necessitates preventing dangerous individuals from crossing borders via land, air, or sea.

INTERPOL actively works to strengthen the capacity of border security in its 196 member countries, fostering partnerships with international organizations and the private sector, and allocating resources to border security initiatives. Its Integrated Border Management Task Force (IBMTF) serves as a lynchpin in this regard, leveraging diverse expertise to assist the organization's member countries in enhancing their border security measures.

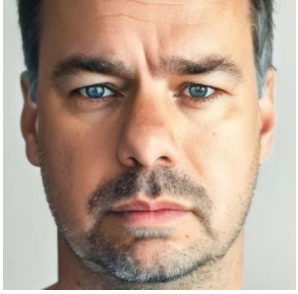
Utilizing INTERPOL's databases at borders empowers national agencies to effectively secure and manage their international borders. With INTERPOL's databases now queried almost 200 times every second, it continues to push for greater expansion of its I-24/7 secure police communications system to reach the frontlines of policing across the globe, ensuring the timely availability of police information during border controls. Collaborative operations play a vital role in augmenting frontline officers' ability to combat crimes such as irregular migration, human trafficking, and other cross-border offenses that pose threats to national and regional security. During these operations, the checks carried out against our global databases, generating hits for individuals wanted internationally, demonstrate the crucial need to extend permanently our service at frontlines.

INTERPOL's commitment to delivering technology and innovation to the frontline was underscored by the launch of its Biometric Hub in October 2023. This initiative significantly enhances member countries' biometric capabilities, playing a crucial role in counter terrorism and the identification and apprehension of suspects across borders. Moreover, biometric data facilitates the identification of criminals involved in human trafficking, drug smuggling, and other illicit activities, thereby combating organized crime. The latest fingerprint and facial matching algorithms, powered by industry leader Idemia, facilitate near real time searches against INTERPOL databases from the front line. The Biometric Hub will be further developed, with increased capacity up to 1 million searches per day in 2026 and incorporating DNA in 2027. Following the inauguration of the Biometric Hub, an operation coordinated by INTERPOL resulted in the apprehension of a fugitive involved in migrant smuggling. Despite presenting a counterfeit passport during a routine inspection in Sarajevo, Bosnia and Herzegovina, the individual's photograph, when cross-referenced with data held by INTERPOL, corresponded to a wanted individual linked to people smuggling and organized criminal activities in another country.

In summary, the complexity of managing international borders demands a comprehensive strategy that incorporates various elements such as enhanced data sharing, strategic partnerships, innovative solutions, and cutting-edge technology. As a cornerstone of global law enforcement, INTERPOL assumes a central role in this mission, leveraging its expertise and resources to combat the ever-evolving landscape of transnational crime and uphold global security standards. Recent advancements in biometric technology coupled with INTERPOL's commitment to international collaboration offer promising avenues for enhancing border management practices worldwide. Embracing these advancements and harnessing the potential of biometric data empowers law enforcement agencies to proactively address emerging threats and maintain a vigilant stance in the ongoing fight against transnational crime networks and acts of terrorism. Through collective action and a forward-thinking approach, we can strengthen border security and safeguard communities on a global scale.

For more information, contact biometrichub@interpol.int

Johanna Morley is a Biometrics Expert with Interpol, based in Lyon, France and has been involved in Facial identification since 2004, when she worked for the Forensic Science Service in the United Kingdom. Johanna joined the London Metropolitan Police Service in 2007 where she worked as a senior facial examiner as part of the digital forensics unit before becoming a senior technologist in 2011. Under Technology, Research & Innovation, Johanna managed a wide portfolio of projects working on the implementation, optimization and development of technology on behalf of law enforcement. She joined INTERPOL in 2023 and most recently was part of the team that delivered the Biometric Hub capability for member countries.



By Carl Gohringer, Vice President, Global Public Sector Business Development, Parvision Inc.

Addressing Regular and Irregular Border Management with a Unified Identity Infrastructure

In the landscape of border management, where efficiency often seems at odds with security, the juxtaposition of regular and irregular border crossings demands a unified identity infrastructure.

Massive strides have and continue to be made in facilitating regular border crossings in a seamless and frictionless manner. The optimisation of travel processes through traveller pre-registration and the integration of advanced face matching systems expedites the clearance of bone fide travellers.

However, any system must go beyond simply addressing efficiency and confront the challenges and security issues related to irregular crossings, frequently triggered by geopolitical pressures like conflict-driven migrations. Criminal organisations, unscrupulously profiting from desperation and promising to facilitate illegal border crossings via perilous means, serve as a stark reminder of how weaknesses in border management can even jeopardise lives.

Cutting-edge technologies, such as highly precise biometric face matching, accurate AI-based liveness detection, age estimation, and those that address the challenges from burgeoning deepfake imagery, offer huge potential that will only be fully realised when considered as integral components of an easily deployable and scaleable border management system.

The convergence of these advanced technologies can enable a border infrastructure that not only meets the demands of facilitating regular passenger journeys, but also addresses the security challenges posed by irregular migration, whilst laying the groundwork of an advanced border managed system.

EFFICIENCY GAINS IN REGULAR BORDER CROSSINGS: A SEAMLESS JOURNEY

Efforts to enhance regular border crossings have seen substantial progress, particularly in streamlining the travel experience for regular travellers. The implementation of pre-registration mechanisms, coupled with advanced face matching systems like Paravision Search, has revolutionised the clearance process, creating a seamless journey process.[1]

Pre-Registration: The Gateway to Frictionless Travel

Increasingly, travellers will have the option to pre-register their intent to cross borders, providing authorities with essential information before their journey begins. This pre-registration, facilitated through secure mobile applications, allows for the submission of biometrics, biographical details, travel itineraries, and other pertinent information well in advance of their arrival on the border.

Seamless Face Matching Systems and Reducing Passport Checks

The integration of face matching systems plays a pivotal role in expediting clearances at various points throughout the travel continuum. Rather than repetitive passport checks at multiple points, face matching systems create a streamlined process by linking the pre-registered traveller's face to their submitted information. From check-in at departure points to arrival at the destination, the traveller's identity is verified efficiently using facial recognition technology, reducing both time and bottlenecks.

Automated Entry/Exit Systems: Enhancing Border Monitoring

Furthermore, automated entry/exit systems (EES), often enabled with face matching technology, facilitate the automatic recording of the entry and exit of individuals, creating a digital footprint that aligns with the pre-registered information. This contributes to a more secure border environment, allowing improved identification of overstayers.

GEOPOLITICAL PRESSURES ARE DRIVING MIGRATION WOES

Whilst legitimate traveller journeys continue to increase, so does the rise of irregular migration and border crossings worldwide. For example, the European continent has been a focal point for migration challenges, experiencing a significant influx of asylum seekers and economic migrants. Conflicts in Eastern Europe

1 Read about Paravision's Reference Design for Contactless Corridors in IBMATA BMT10

and the Middle East, coupled with socio-economic disparities, have fueled mass migrations, placing immense pressure on European borders

Conflict-Driven Migrations

Conflicts in Ukraine, Syria, Afghanistan, and other regions have triggered large-scale displacements, leading to a surge in asylum seekers seeking refuge in Europe. The magnitude of these migrations has strained existing border management systems, necessitating new approaches to maintain both efficiency and security.

Organised Criminal Organisations' and Irregular Migration

The challenge of irregular border crossings is significantly compounded by the insidious scourge of organised criminal organisations capitalising on the desperation of individuals fleeing dire circumstances. Not only do they exploit and endanger the vulnerable, but they exacerbate security concerns by employing sophisticated tactics and technologies making it more difficult to distinguish legitimate and illegitimate asylum claims.

ADDRESSING THE CHALLENGES OF IRREGULAR MIGRATION

In addressing irregular migration, the challenges extend beyond efficient processing. Criminal elements take advantage of the desperation of migrants, manipulating vulnerabilities and using unscrupulous means to gain entry.

Enhancing Precision in Migrant and Asylum Processing

Effective and streamlined processing of migrants and asylum seekers upon their arrival at the border is imperative. Essential to this process are enrollment procedures that facilitate the swift capture of biographic and biometric data, encompassing in particular fingerprints and face photographs. Individuals attempting to claim asylum repeatedly by using different names or nationalities can be detected by using their biometrics to search for duplicates in the system. Additionally, external systems, such as national and international criminal records and Visa systems, can be searched to assist in determining previously established true identities.

Innovative artificial intelligence techniques further fortify these procedures and can help determine the veracity of supplied information, such as by allowing for the nuanced analysis of voice patterns and dialects / accents to accurately trace claimants' geography of origin. This comprehensive approach not only elevates the efficiency of handling migrant and asylum applications but also reinforces the system's proficiency in identifying security risks and potential fraudulent activities.

The Need to Accurately Assess Applicants' Ages

A concerning trend is the abuse of the asylum system by migrants without documents falsely claiming to be minors. Special considerations and preferential treatment afforded to minors create an incentive for adults to misrepresent their age. This not only strains resources but also undermines the fairness of the asylum process.

Deepfake Manipulation in Irregular Migrations

The rise of deepfake technology further complicates border management efforts. Criminal trafficking gangs are beginning to use deepfakes to create fraudulent images of travel documents, manipulate imagery on migrants' mobile phones, and even spread misinformation on social media platforms, all to support bogus asylum claims. Detecting such manipulated media is becoming crucial to maintain the integrity of identity verification processes.

PARAVISION SEARCH: UNDERPINNING ADVANCED CAPABILITIES

Paravision Search[2] has emerged as a key enabler for next-generation border management, providing advanced capabilities that address the challenges of irregular migrations whilst simultaneously underpinning the enablement of frictionless regular travel.

Biometric Precision

Paravision Search's biometric precision enables accurate identification even in challenging scenarios. The NIST FRTE-leading[3] system helps to ensure reliable identity verification across use cases, environmental conditions, and demographic variables, all crucial for addressing the misuse of asylum claims and preventing entry based on falsified information.

Biometric Enrolment and Harmonised Face Searching

The efficient registration of migrants' biographic and biometric data is paramount. A unified matching platform can enable bi-directional cross-referencing and searching using face recognition across datasets encompassing both regular and irregular travellers.

Presentation Attack Detection During Pre-Registration

Paravision Liveness can identify presentation attacks during remote selfie capture, thus preventing individuals from falsifying their identities in an attempt to exploit new seamless border procedures designed

2 https://www.paravision.ai/paravision-search/

3 https://www.paravision.ai/benchmarks/

to facilitate border crossings for genuine travellers.

AI-Based Age Estimation: Protecting Against Deception

Paravision Age Estimation can assist in combatting the abuse of the asylum system. By analysing face images, the system provides highly accurate age estimates, adding a layer of scrutiny to prevent fraudulent exploitation of age-related benefits.

Deepfake Detection: Safeguarding Against Manipulated Media

Paravision Deepfake Detection can aid in the detection of manipulated media. The system employs sophisticated deep learning to identify and differentiate between authentic and manipulated images, ensuring the validity of imagery and preventing misinformation.

CYDONIA: A FULLY MANAGED, MASSIVELY SCALABLE MATCHING ENGINE UNDERPINNING A HOLISTIC SOLUTION FOR BORDER MANAGEMENT

Integrated with Cydonia[4], the capabilities of Paravision Search enhance IdentityE2E's platform to provide a unified, holistic approach to border management. This integration ensures security, scalability, and exceptional cost efficiency, while meeting the comprehensive array of requirements outlined previously.

Fully Managed SaaS

Cydonia's fully managed Software as a Service (SaaS) in AWS integrates Paravision's advanced biometric face recognition technology as a fully managed service for government agencies, providing world-class accuracy, scalability, and security alongside a dramatic reduction in total cost of ownership. Alternatively, Cydonia can be deployed and managed within customer controlled cloud accounts, where this is a requirement.

Government Standards Compliance

Meeting stringent government standards is imperative for effective border management. Cydonia helps ensure compliance with these standards, offering a turnkey solution that combines efficiency, security, and adaptability.

Dramatically Reduced Total Cost of Operation

An independent evaluation conducted on behalf of a national government agency established that Cydonia is up to 90% cheaper to operate than comparable platforms for certain SLAs. The auto scaling-functionality significantly reduces compute costs and enables governments to only pay for necessary compute at all times. Platform management requires a small team of engineers for a national-scale solution, as opposed to 10-20 with other comparable platforms.

Extremely Fast, Trusted, Automated and Scalable Installation

Additionally, greenfield, national-scale solutions enabling AWS best practice security and compliance to stringent standards can be deployed in under 24 hours. Enrollment of 20 million identities is possible in less than 24 hours, as opposed to multiple months with other comparable platforms. All while allowing scalability to hundreds of millions of gallery images and thousands of concurrent searches per second.

CONCLUSION: AN IDENTIFICATION FOUNDATION TO ENABLE A FUTURE-PROOFED BORDER MANAGEMENT SYSTEM

Migration challenges demand a multifaceted approach that harmonises efficiency with heightened security. Paravision Search, with its advanced capabilities in biometric precision, AI-based age estimation, presentation attack detection, and deepfake detection, is a significant enabler of this endeavour. When delivered via IdentityE2E's Cydonia platform, a comprehensive and future-proofed border management system is realised.

The collaboration between Paravision and IdentityE2E[5] signifies a commitment to addressing the unique challenges faced by border management agencies. As the migration landscape evolves, the synergies offered by this integrated solution pave the way for a secure, efficient, adaptable, and highly cost-effective border management system. With a focus on precision, compliance, scalability and rapid deployment, the partnership contributes to shaping the future of border management in an ever-changing world.

Carl Gohringer is Paravision's Vice President of Global Public Sector Business Development, focussing on borders, travel, identity documents, counter terrorism, national security, police, defence, and home affairs. Working with end-clients, partners, and system integrators to meet the demand for accurate, secure and convenient identification solutions, he is passionate about leveraging technology to enable a safe and secure society and is always looking for new opportunities to collaborate with government agencies and industry partners to achieve this mission.

4 https://aws.identitye2e.com/cydonia-advanced-biometric-face-search-platform

5 https://www.paravision.ai/news/identitye2e-and-paravision-partner-to-revolutionize-government-operations-with-cost-effective-face-recognition-at-scale/

FEATURE

By Uku Särekanno,
Deputy Executive Director,
Frontex

Towards fully digitised European border management

The situational picture of the European Union's external borders is a complex one. Over the past three years, we have witnessed a significant increase in the migratory pressure at EU's external borders, with some 380 000 irregular border crossings recorded in 2023 – the highest level since 2016. At the same time, the instrumentalisation of migration by state actors along the Eastern border and the less stable geographical environment stemming from the war in Ukraine have created a need for even more coordinated efforts to maintain the security and integrity of our borders while providing shelter and protection to those in need.

Furthermore, as a major travel destination, Europe's Schengen area is seeing regular travel flows returning to their pre-pandemic levels, with over half a billion visitors in 2023. Each of these border crossings entails checks on travellers and documents, requiring significant human resources. Yet, at the same time there is no comprehensive, EU-wide system for registering those entering and exiting the area, which makes it impossible to accurately estimate the number of non-EU nationals staying in the Schengen area.

This has posed significant risks, along with less effective identification of overstayers and of those without a right to enter. The lack of fully automated, centralised systems for biometrically registering travellers coming into the Schengen area has also made it easier for criminals to use fake identities and fraudulent travel documents, while putting bona fide travellers at a disadvantage as manual administrative procedures at the border crossing points translate into longer waiting times.

UPGRADED IDENTITY MANAGEMENT

European border management is currently undergoing a profound transformation to address these security gaps and facilitate a more seamless travel experience for the visitors.

Replacing the manual stamping of passports, the Entry/Exit System (EES) will provide a centralised database where entries and exits of non-EU travellers will be automatically registered along with their biographical and biometric

information. With ETIAS – the European Travel Information and Authorisation System – European authorities will be conducting pre-travel security checks on non-EU nationals who have so far enjoyed visa-free travel to find out in advance who intends to come to the Schengen area.

The introduction of these groundbreaking border management initiatives serves a dual purpose: they will provide a more personal risk assessment of those entering the Schengen area, mitigating many of the risks that currently exist. At the same time, they will enable further automation of border management in Europe and eventually facilitate travel across the border. The technology will not replace the need for manpower, rather it will enable us to manage resources in a wiser manner and move them to where they are most needed.

Introducing changes of this magnitude simultaneously at the borders of 30 different countries does not come without challenges. On the one hand, operational risks accompany any kind of digitisation effort and digitising the management of our external borders is no exception. While many of these risks can be managed with technical solutions, the worst-case scenario should always be taken into account. In other words, we must have a plan B for situations where the systems are down.

At the same time, the digital evolution in the European border management profoundly changes the way we conduct our business. As we aim to replace the traditional stamping of passports with technology, this does not mean only a new approach to infrastructure development at airports and other border crossing points, but also changes the way European border guards perform their tasks and how their work is organised. This requires careful planning and preparation across Europe.

NEW WAY OF TRAVELLING TO EUROPE

The EES and ETIAS will not only transform the tasks of European

border authorities, but they will also profoundly change what the traveller's journey to the Schengen area will look like.

Let's take visa-free nationals of non-EU countries as an example. Currently, they follow a rather traditional travel process. Once they arrive at the border crossing point, the border authorities, lacking advance information on incoming travellers, check their identity and assess whether they pose a security risk. Once deemed eligible to enter, the travellers get a stamp in their passport, showing the date of entry, that can later be used to calculate the remaining period of their allowed stay in the Schengen area.

With the new systems, the process for visa-free travellers will start much earlier, even before they physically leave their place of residence. They will be required to apply for a travel authorisation through the official ETIAS website europa.eu/etias, allowing the European authorities to perform an advance risk assessment on them. The travel authorisation will also be checked by carriers, such as airline, coach or ferry companies, prior to boarding. As the non-EU nationals arrive at the border crossing points, the border guards will verify that they possess a valid ETIAS travel authorisation and register their travel document data in the EES along with their facial image and four fingerprints. These data will be verified each time the traveller crosses the Schengen border.

The launch of the EES is likely to cause longer waiting times at the external border, especially in case of first enrolment. To speed up the border checks, Frontex is developing on its own initiative, an EES mobile application which will allow travellers to share some of the information required in advance. We do this to support border agencies, businesses and travellers, and it will be soon tested at Arlanda airport in Stockholm, Sweden. Our aim is to have a fully-fledged version of the app ready by the end of the summer, so it can then be gradually integrated by Member States into their national systems starting from early autumn. It should be stressed however, that the use of the EES mobile app is not mandatory – it will be up to the Member States to decide if, when and where they may wish to use it. It will also be voluntary for travellers to make use of the app.

As a pre-travel screening system, ETIAS will contribute to reducing administrative burdens at borders, making travel easier and more convenient for the 1.4 billion potential visa-free travellers, while also bridging significant security gaps. Moreover, the biometric check with the EES will help to prevent terrorism or other serious criminal offences by boosting the capacity of the border guards to detect identity or document fraud thanks to the biometric enrolment. It will also enhance capabilities of the Schengen countries to manage migration through the systematic detection and identification of overstayers, which should also facilitate their return process. The introduction of the EES will also allow for a better monitoring of the total number of all refusals of entry at the external borders.

JOINT EUROPEAN EFFORT

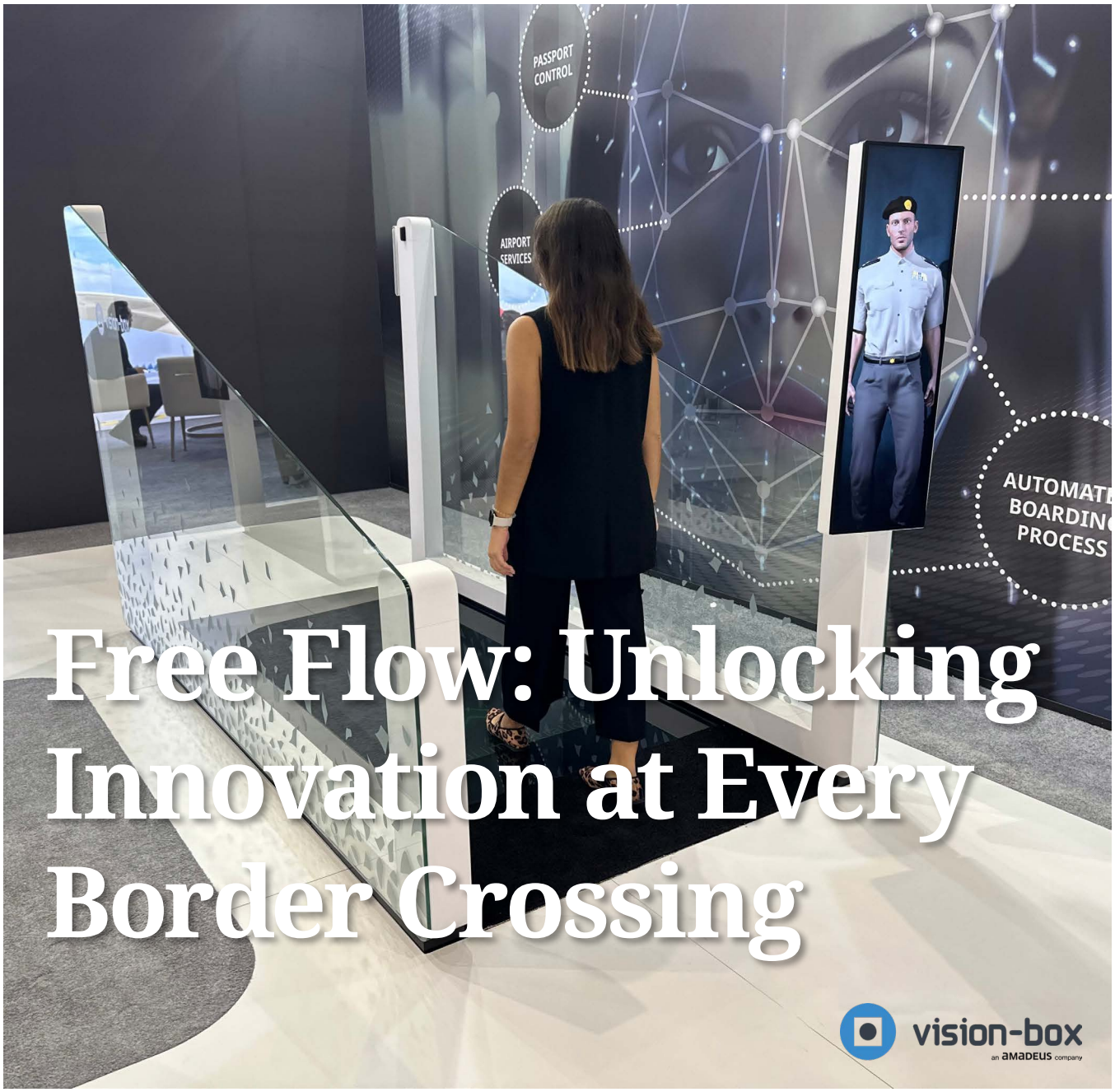
The EES and ETIAS focus on more effective and secure management of regular traveller flows, and are set to change how European borders are managed. Their implementation, however, is a challenging task, requiring seamless coordination among four EU institutions and the national authorities of 30 European countries. This means that the role of the European Border and Coast Guard Agency Frontex in ensuring success of both projects is increasingly important.

As an agency with a unique capacity to continuously follow the situation at the external borders, Frontex will continue supporting Member States and guiding them on how to make the best use of the systems, adjust their business processes and ensure uniform practices on border controls. All this in close cooperation with our stakeholders and institutional partners.

Uku SÄREKANNO is serving as Deputy Executive Director of Frontex. He is responsible for the Agencies corporate functions, budget and finances, crises management and ICT. His tasks involve direct oversight and coordination of ETIAS Central Unit Division and Financial, Digital and Security Division.

FEATURE

By Davydson Carnelossi,
Head of Product Innovation, Vision-Box



Free Flow: Unlocking Innovation at Every Border Crossing

In the fast-paced world of travel, operators and border forces strive for an effective and faster way of processing travellers. Modernisation is key to achieving a higher throughput while maintaining high-level security standards. This is only possible through automation. The implementation of a framework based on biometric and biographic information capture allows for precise and secure handling of millions of individuals. This process is streamlined only by a robust digital identity management platform able to handle all data and give back to officers the relevant information for a better decision-making process.

Automated systems can quickly match images against biometric galleries to authenticate identities, reducing wait times and improving the overall travel experience. Biometric systems provide an additional layer of security at border crossings by ensuring that individuals are who they claim to be. This helps authorities to detect and prevent border crossing of criminals, terrorists and other

security threats. With the use of automation, we improve efficiency, increase accessibility to travellers' information, standardise data collection methods and help in the reduction of illegal movements.

The facilitation of border forces mechanisms and the streamlining of identification processes can be an opportunity to automate border control for countries that haven't yet implemented this type of technology. Although the common rule is to perform 1:1 verification, where border forces verify individuals are who they say they are, by implementing biometric backend systems that aggregate the traveller's biographic and biometric data captured on past interactions and enabling the 1:N face identification of travellers, countries can streamline even more border crossing without requiring an enrolment process. Verification is only performed as a fallback after the identification.

HOW DOES THIS HAPPEN?

This is only possible in combination with systems such as the API/PNR (Advanced Passenger Information / Passenger Name Record). PNR refers to a unique identifier containing traveller information stored by airlines for booking and management purposes. It includes information on travel itinerary, ticket information, contact details, means of payment and others. API gathers traveller details before arrival or departure to enhance border security and streamline processes.

The process at the border control touchpoint is simplified. Travellers only need to have their face image captured to get a transaction outcome. It significantly reduces the issues with document reading interactions, reducing the processing time, and improving the traveller experience, as the individual is required to perform a simpler process. This enables converting traditional ABC (Automated Border Control) gates into on-the-move solutions, as well as the creation of biometric corridors with much higher throughputs.

The free flow concept eliminates the need for traditional control barriers and creates an uninterrupted traveller experience, replacing them with a risk-based digital ecosystem, supported by consented data, smart infrastructure allocation and free flow forward workflows.

HOW IT WORKS?

Travellers will arrive at the border pre-cleared to travel and go through a corridor that will perform 1:1. Free flow replaces narrow access controls with wider corridors equipped with AI-based image processing and tracking technology. Advanced camera systems increase efficiency by capturing high-quality images for biometric processing. The traveller only needs to enrol biometrically via our Seamless Kiosk® or through our Seamless Mobile® solution. This process can be performed by the travellers using their mobile phone, by projecting their ID into a digital sphere. This way travellers can arrive at the airport pre-cleared using their face as their passport.

Free Flow is an innovative concept, with on-the-move biometric capture that prioritises efficiency, and security, and provides a better experience for travellers. It has the highest standard of security and privacy while having the fastest throughput. Free Flow orchestrates real-time data with biometric devices within a collaborative ecosystem, integrated with AI biometrics and highly accurate passive presentation attack detection algorithms.

Davydson Carnelossi is a professional with over 25 years of extensive experience in the aviation industry. Currently serving as the Head of Product Innovation at Vision-Box, an AMADEUS company, he leads strategic initiatives to drive innovation and enhance customer experience within the aviation sector. With a proven track record of excellence, Davydson has held various leadership roles, demonstrating expertise in aviation operations, strategy development, and business management. Throughout his career, he has consistently driven innovation and efficiency, contributing to the success of both large-scale airlines and smaller aviation enterprises. Prior to his current position, Davydson held key leadership roles at Azul Linhas Aéreas Brasileiras and GOL Linhas Aérea, where he played a pivotal role in optimizing IT operations and infrastructure to support the company's growth objectives, driving IT initiatives to streamline processes and enhance operational efficiency.

FEATURE

By Georgios Stavropoulos,
Centre for Research and Technology Hellas, GR
(left) and James Ferryman,
University of Reading, UK (right).

Enhancing Border Security Through Innovation: The EINSTEIN Project

ABSTRACT

Border security is a critical aspect of national security, with law enforcement agencies and border guards tasked with combating frauds on identity and travel documents both physically and online. The EINSTEIN project aims to significantly enhance the capabilities of police and border authorities in this regard through innovation. This paper explores the objectives of the EINSTEIN project, its applications in border checks and combating identity frauds, and its focus on ensuring interoperability, flexibility, and privacy compliance. By leveraging and enhancing proven technologies and piloting various use cases, EINSTEIN seeks to address the challenges posed by highly skilled defrauders and contribute to strengthening border security measures across Europe.

INTRODUCTION

The proliferation of identity frauds and fraudulent travel documents poses significant challenges to law enforcement agencies and border guards worldwide. While various technologies and strategies have been employed to combat these threats, there is a continuous need for innovation to stay ahead of

increasingly sophisticated fraudsters. The EINSTEIN project, co-funded by the Horizon Europe programme, seeks to address this need by enhancing existing public authorities' means through innovation. This paper delves into the objectives, applications, and implications of the EINSTEIN project in the context of border security and identity fraud prevention.

EINSTEIN OBJECTIVES

The primary objective of the EINSTEIN project is to enhance the capabilities of public authorities in combating identity frauds by leveraging innovative technologies. To achieve this goal, EINSTEIN aims to deliver six essential applications:

1. Online ID Issuance: An eGovernment platform that allows citizens to apply online for the renewal of their travel documents (i.e. passports). Users upload a facial photo (i.e. "selfie"), which, along with stored reference biometrics, is sent to a trusted cloud-based server. This server houses a Biometrics Assessment Service (BAS) that evaluates the photo for potential morphing or manipulation attacks and assesses its quality. The goal is to prevent fraudulent enrollments. Initially using existing technology, the BAS will continuously improve with new algorithms. Integration with offline processes like MRTD enrollment is possible. Face image quality meets ISO/IEC 39794-5 standards, ensuring compliance with ICAO. The service is adaptable, potentially extending to assess other biometric data like fingerprints from EES kiosks.
2. Mobile Document and Identity Checks: A mobile application to be used by police officers "on the "go" on smartphones and tablets that will scan ID documents, identifying their nature and assessing their authenticity. It integrates Morphing Attack Detection (MAD) and Presentation Attack Detection (PAD) modules, verifying document security features. Anomalies are highlighted for further review. Police officers receive guidance and online training during scanning. If legally permissible, facial biometrics can verify document-person match. EINSTEIN will develop an expandable framework for: (a) Document types, (b) Customizable analysis modules, and (c) Future support for biometric modalities like fingerprints.
3. Document Authentication Module: This application aims to aid immigration services and border guards in authenticating breeder documents. It comprises a central computer for experts and then clients with scanners at remote locations for less-experienced users. Genuine documents enjoy a fast lane with minimal expert interaction. Suspicius scans receive thorough examination by experts, with interpretive system suggestions. Negative decisions require human confirmation. Experts can enhance the system by adding annotated images and knowledge. Collaboration with FRONTEX (DOC-EXP) ensures progress monitoring, insights exchange on fraudulent documents, and compliance with FIELDS and FADO databases.
4. Pre-Registration for Land-Border Crossings: will facilitate pre-registration for border crossings, akin to the check-in process for air travel. Travellers will submit their travel credentials (ePassport, biometrics, DTC, etc.) along with travel details (exact border crossing point, estimated arrival time, mode of transportation, companions, etc.). This provides border authorities with advanced traveller information, enabling them to (a) better allocate resources at the border and (b) conduct preliminary checks on the submitted data, thereby enhancing border security. Initially focused on land border scenarios, the pre-registration application will explore adaptations, modifications, or extensions to accommodate other types of border crossings as required (e.g. integration with Fast Corridor below)
5. EES Kiosk with Advanced Fraud Detection: Kiosks are to be installed at Schengen borders to input Third Country Nationals' (TCNs) data into the Exit Entry System. TCNs will provide fingerprints, facial images, and biographical information at these kiosks. While it's essential for border guards to oversee biometric data acquisition to assist travelers and prevent fraud, this places a significant burden on border authorities. Automation of some processes is necessary to alleviate this burden. In addition to incorporating advanced MAD, PAD, and other face manipulation detection methods into the EES kiosk, EINSTEIN proposes automatically monitoring travelers' behavior during data input using video analytics. Alerts will be raised in case of anomalies, such as improper submission of biometrics by a traveler.
6. Fast Track for Enrolled Travelers: This application will be in the form of a smart corridor that will enable travelers to undergo seamless identity verification at border crossings without stopping. It will utilize face and iris recognition technologies within a biometric corridor, focusing on accuracy and efficiency. Building on previous projects achievements, the corridor will prioritize face and iris biometrics. Travelers will enroll for fast-track usage online, generating a Digital Travel Credential (DTC),

validated by border authorities. The process will ensure a smooth traveler experience while maintaining security and efficiency. Interoperability testing will involve various types of DTCs from different providers.

To ensure the readiness of these applications for operational use, the project aims for a Technology Readiness Level (TRL) of at least 7. This is to be achieved through the implementation of six different pilot use cases in practitioners' environments.

INTEROPERABILITY AND FLEXIBILITY

An essential aspect of the EINSTEIN project is ensuring the interoperability and flexibility of its components. This is critical for enabling the reuse of developed technologies in different contexts and by different providers. To achieve this objective, the project emphasizes the design of open, well-defined, and standardized interfaces. By adhering to these principles, EINSTEIN aims to maximize the scalability and applicability of its innovations across various border security scenarios.

PRIVACY CONSIDERATIONS

Privacy is a paramount concern for European citizens and governments, especially concerning the processing of personal data in border security initiatives. Recognizing this, EINSTEIN incorporates privacy-by-design principles into its development process. This involves developing flexible components that can be easily customized to meet not only European legislation on data protection but also national regulations, which may vary significantly across different countries. By prioritizing privacy compliance, EINSTEIN aims to build trust among stakeholders and ensure the responsible use of data in border security operations.

CONCLUSION

EINSTEIN represents a significant step forward in enhancing border security measures through innovation. By focusing on developing practical applications to combat identity frauds, ensuring interoperability and flexibility, and prioritizing privacy compliance, EINSTEIN aims to empower public authorities in their mission to safeguard national borders. As the project progresses and pilot use cases are implemented, it is expected to contribute valuable insights and solutions to the ongoing efforts to combat frauds on identity and travel documents physically and online across Europe. More information on EINSTEIN project can be found online:

- Website: www.einstein-horizon.eu
- LinkedIn: https://linkedin.com/einstein-horizon
- X: https://x.com/einstein-horizon
- Email: coordinator@einstein-horizon.eu

Co-funded by the European Union

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His main research interests include signal processing, computer vision, biometrics, artificial intelligence, visual analytics, natural language processing, internet of things (IoT) and more. Since 2006, he has been involved numerous European and National projects, both in coordination & scientific management but also in R&D activities. Currently, he is coordinating the Horizon Europe projects Ceasefire (GA. 101073876) and Einstein (GA. 101121280). As an expert developer, with a lot of experience in C++, C# and Python programming languages, as well as various libraries, SDKs and API's, he has developed numerous applications and algorithms for information collection and visualization, text mining, text sentiment estimation, biometric authentication and verification, activity recognition, image analysis and more. He is a member of the Technical Chamber of Greece. His involvement with these research areas has led to the authoring and co-authoring of more than 30 articles in refereed journals and international conferences.

PROF. JAMES FERRYMAN is a computer scientist and leads the Computational Vision Group within the Department of Computer Science, School of Mathematical, Physical and Computational Sciences (SMPCS), University of Reading. His current research interests include multimodal biometrics, automated video surveillance and benchmarking. He is the author of more than 100 scientific publications. He has participated in a wide range of UK and EU funded border seucity research programmes including as overall coordinator of the EU H2020 PROTECT project (www.projectprotect.eu) on exploration of current and future use of biometrics in border security and key partner in the previous EU FastPass (www.fastpass-project.eu) and current EU D4fly (www.d4fly.eu) projects on border security. Prof. Ferryman is an appointed member of both the UK Home Office's Border Vision Advisory Group (BVAG) and the European Commission's Expert Group for the Community for European and Innovation for Security (CERIS) Border Management sub-group.

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FEATURE

By Antony Vendhan,
Co-Founder, Identy

Prevent Potential Chaos for Travelers with mobile biometrics: Seamless Border Crossing - An Innovative Approach

LONG QUEUES AT BORDERS

We can't forget the impact of Covid-19 and Brexit. It dramatically shocked our way of life, reshaping various processes and prompting adaptability in how we approach everyday tasks. One clear example that has experienced significant change is biometric identity verification, particularly in the context of travellers and government agencies. Before the completion of Brexit and the onset of Covid-19, government agencies were adopting biometric technologies such as scanners and fingerprints to verify customers' identity. The Covid-19 pandemic brought disruptions and challenges such as restrictions on physical contact and social distancing measures. The old way of biometric verification often required physical contact with surfaces or devices, this became less feasible in some situations due to potential health risks associated with the pandemic. Also, many travellers are not comfortable using these verification devices due to the potential health risks associated with the surface transmission of the virus.

Brexit has also had implications on biometric identification regulations and data protection. Brexit ended the UK's participation in the European freedom of movement policy. This impacted immigration policies and the movement of people between the UK and the EU. Due to these new changes citizens/travellers need to verify their identity during border crossing. What used to be a quick border crossing will now likely become a lengthy process, potentially extending from minutes to hours. With the anticipated increase in the number of travellers, the time taken is expected to increase. The need for a thorough identification process may lead to delays and congestion at the border checkpoints further

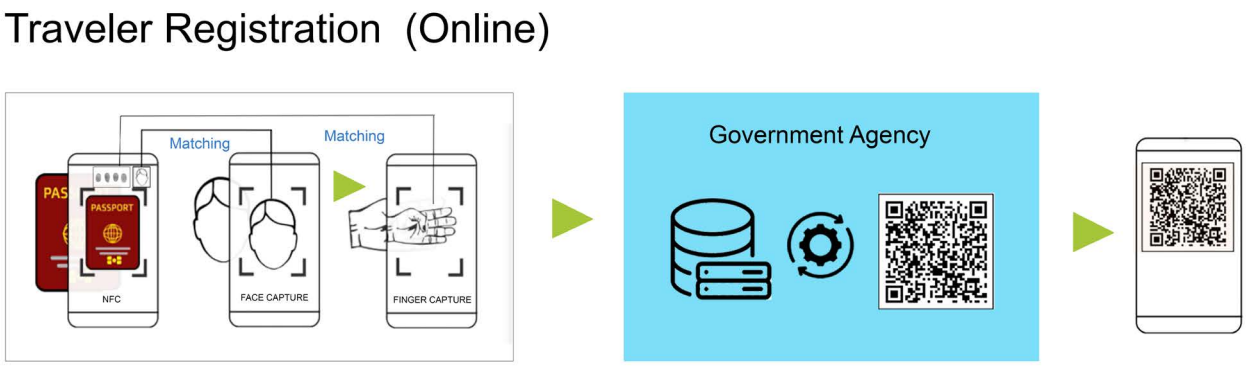
inconveniencing the travellers.

Millennials are comfortable doing anything and everything using their mobile phones.

As a result, now more than ever, it is important to explore contactless biometric technology to streamline the border-crossing process and alleviate the impact of these inevitable delays.

Identy has the right technology to identify travellers without friction or delays. This technology is well suited to solve the current problems in cross-border travelling.

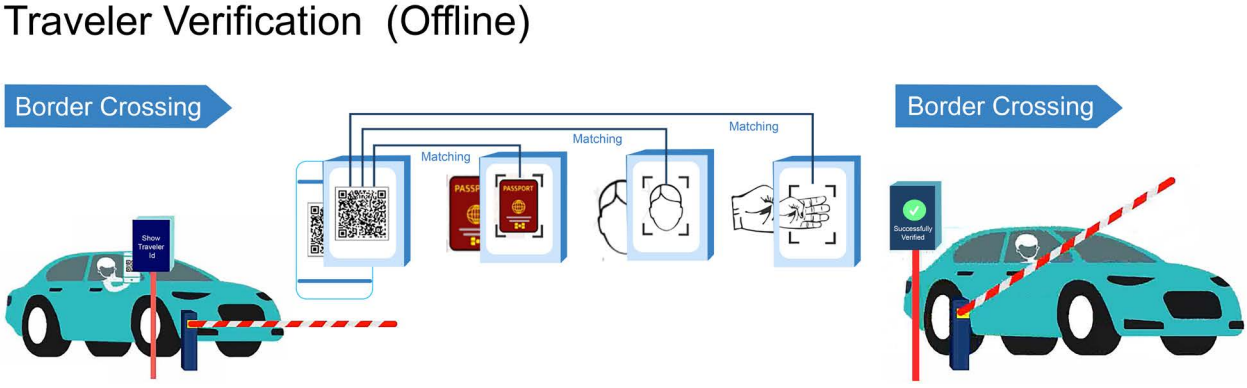
SO HOW DOES IDENTY TECHNOLOGY WORK?



Identy's technology can turn smartphone cameras into advanced fingerprint, facial, and ID scanners. This particular patented technology will carry out biometric verification by simply capturing the photo of an individual's ten fingerprints and face using a smartphone's camera.

During the photo capture, a traveller is expected to look steadily at the camera or just to keep their fingers under the camera for accurate results. This biometric image data is then electronically verified against the biometrics data that is stored on the passport's NFC chip. The matching happens within a couple of seconds at the traveller's convenience. Identy seamless integration enhances the accuracy and reliability of the verification process which ensures the security standards set by the government are met. By collaborating with government agencies, Identity ensures that travellers' sensitive information is protected against unauthorised access. Furthermore, the ministries will develop mobile apps leveraging the technologies provided by Identy. Upon successful verification of the traveller, the Identy solution converts the biometric data into a safe and secure digital ID. The digital ID stores a user's credentials in electronic format.

Once the traveller is at the border checkpoint, the traveller's digital ID will be presented to the officer at the border. The border officer should be equipped with Android/ iOS devices to allow the extraction of the traveller's fingerprints and facial image from the digital ID. After the extraction, it will match the biometric data against the traveller's fingerprint and face biometrics in real-time for accurate verification. Once the verification process is complete the traveller will be allowed to cross the border and this facilitates a smooth travel transition.



BENEFITS

This streamlined mobile contactless biometrics at land border clearance has major key benefits. By utilising a smartphone camera as the primary tool for biometric verification, Identity's approach eliminates the need for often expensive hardware. This promotes accessibility and ensures that biometric verification competencies are available to a wider audience. Capturing fingerprints and facial images using a smartphone is an intuitive task that can be completed within a few seconds. This efficiency translates into time saving for all the parties involved in the process. Since Identy's solution relies on smartphones it is cost-effective since the customer and the government agencies will use their existing smartphones. Travellers will no longer need to visit specific locations for identity verification purposes. Instead, they can do the verification process conveniently with access to smartphones. This will make the process convenient for travellers and passport officers.

The Identy approach is scalable and reliable in the sense that it can accommodate a large number of travellers using our biometric verification at the same time. It is highly performant meaning it is designed to meet the changing needs and demands throughout. Smartphones are ever-evolving, and the scalability of identity's contactless approach ensures that biometric verifications can accommodate evolving requirements in the face of population growth.

The use of digital identity ensures the traveller's identity is verified using electronic credentials, in our case the fingerprints and the image which are securely stored. These digital IDs are difficult to tamper with since the data is encrypted. In addition, the digital IDS biometric data is unique to each individual and provides an additional layer of security. This ensures the traveller presenting the ID at the border checkpoint is indeed the authorised holder. The data exchange between the traveller's device and the border officer's device is also protected from tampering due to the use of a cryptographic technique offered by Identy.

With Identy's approach border control officers can oversee the verification process in real-time and can act promptly against any security breaches and take immediate actions to address security concerns.

The traveller's experience is greatly enhanced by the simplicity and convenience of capturing fingerprints and facial images using a smartphone camera since they are accustomed to using their smartphones daily. This familiarity contributes to a higher success rate and overall adoption of a smooth mobile contactless biometric verification process.

The integration of identity's mobile contactless biometric solution into the land border clearance process is crucial in enhancing data protection and convenience for travellers and border control officers. Identy solution approach ensures biometric verification can be conducted seamlessly without the need for physical contact or cumbersome operations.

Beyond Identy's benefits, Identy's technology offers solutions to combat identity fraud.

By making use of advanced and safe biometric processes, it provides security against

identity frauds. Implementing a contactless biometric solution can shore up your security and limit losses for the long term.

More and more people will be travelling and that number is not going to go down anytime soon. Implementing a contactless biometric solution can shore up Government efficiency and will allow the traveller to cross the border quickly to reach their destination faster. This happy customer will also spend more money at the destination and that will help the economy as well.

Though still a new concept, Mobile biometrics will become more popular in the future due to its main function. It provides convenience for all its users. Biometric verification doesn't need to be a hassle or stressful and people don't want it to be. Instead, it should be easy and smooth. Mobile biometrics provides exactly that with the assistance from digital identity verification.

In light of these benefits, we urge the government to consider partnering with Identy to implement mobile contactless biometric technology for border crossing.

In closing, it's clear to see that more people than ever before will become aware of contactless biometrics and that this is an opportunity for Government agencies to improve their systems for the future.

END GOAL

The governments should enable access to the fingerprints stored on the NFC chip.

Minimum Device Requirements:
Android: Android 6 and above, 2 GB RAM, 5 MP Camera with flash
iOS: iOS 11 and above.

Antony works at IDENTY. IDENTY offers contactless mobile biometrics solutions to identify users remotely and securely using patented AI technologies. Antony, along with his team, is committed to enabling the reach of digital and financial services at the last mile by empowering the people to prove their identity by just using the mobile phone.

FEATURE

By Paul Hollingshead,
Vice President of International
Strategic Partnerships,
S2 Global

The Future of Customs Inspection: Embracing a System of Systems

In recent years, the world has grappled with a multitude of challenges, from pandemics and climate change to evolving geopolitical landscapes and the spectre of global conflict. Amid these complexities, the agencies responsible for safeguarding national borders, our customs and border authorities, contend with a perennial need to adapt. They are tasked with managing the secure and efficient flow of goods and people across borders, and this responsibility demands continuous innovation in response to strategic shifts. These demands are seldom accompanied by a proportionate increase in financial or operational resources.

Traditionally, customs personnel have played a pivotal role in the intricate workflows which facilitate trade, ensure security and promote national prosperity. Yet, as the volume and pace of global trade have surged, officers have found themselves inundated with data. They are caught in an intensive cycle of navigating incompatible systems, burdened with the cognitive strain of correlating, analysing and making critical decisions. In a world where automation, autonomy and AI permeate our daily lives, customs authorities find themselves struggling to apply it. They remain hamstrung by monolithic systems designed without interoperability in mind, and they are reliant on suppliers with business models that hinder rapid innovation.

In an era of advanced software, abundant computing power, and intelligent networks, we have the opportunity to alleviate the burdens of data collection, analysis, decision-making, and physical intervention in the inspection process. The era of hardware-centric, inflexible software should be a thing of the past. In this context, a "system of systems" approach, facilitated by open software platforms, should be a priority for customs authorities.

This approach, already widespread in the commercial realm through

the Internet of Things (IoT), involves integrating independent systems and products into a cohesive, interoperable framework. Imagine a smart home where one manufacturer's security system seamlessly connects with another's smartphone or smart speaker to alert the homeowner of a visitor or delivery. Each manufacturer actively collaborates to enhance interoperability and collectively drive the value they offer. Furthermore, they are incentivised to continue innovating, providing increasing value during the period of consumption to stay ahead of their competition and promote brand loyalty.

For customs authorities, adopting this approach means identifying well-defined workflows and employing a software platform to connect the panoply of inspection sensors, communication networks, databases, and user interfaces. This accelerates the transformation of data from diverse sources into actionable information, leading to efficient adjudication decisions and subsequent actions or releases. Drawing inspiration from advancements in our domestic lives and the business sector, where competing companies collaborate to create integrated systems, customs authorities can achieve efficiency gains in specific workflows and rapidly move on to adjacent ones. Consider how Amazon initially began as an online bookstore, streamlining the purchase and consumption of books before ultimately becoming a platform for buying and selling anything, revolutionising the entire retail industry.

A "system of systems" approach not only generates economic benefits to the nation leveraging it but also strengthens diplomatic ties. It enables countries to pool resources, expertise, and capabilities, sharing integrated data packages that document sensor data and human interactions. By intelligently exchanging this data, customs authorities can conduct joint operations, enhance combined situational awareness, and optimise resources. Furthermore, this software-defined, hardware-enabled approach can often align with national economic agendas. It creates the conditions for the development of sovereign AI programs and critical national technologies. By ensuring open system architectures and APIs, governments can assess whether to use domestic or international modules, or even opt for bespoke solutions, thus avoiding supplier-driven monopolies that have historically hindered rapid innovation. Additionally, certain technological elements can be protected for unilateral use if necessary.

To bring this vision to fruition, customs authorities must incentivise industry participation. They should be willing to experiment, articulate desirable outcomes, establish meritocratic competitions, and offer viable contracts to competition winners. Encouraging private sector investment in research and development, while sharing this vision of an integrated system of systems with industry, is crucial. Diversifying the supply base will foster interoperability and drive advancements, not just in technology but also in techniques and procedures.

Selecting the best technologies necessitates performance-based testing and evaluation, and an assessment of how multi-vendor components operate together, importing and exporting data efficiently. In this way, industry will be motivated to interoperate, and the outcome will provide customs authorities with the capacity they need to manage their national borders effectively. Multiple countries can act as one, driving cost efficiencies and improving situational awareness across trading blocs. Such a coordinated approach will impose significant costs and risks on organized criminal networks that seek to exploit extant vulnerabilities in customs processes.

By thinking software-first, vendors and customs authorities will enable the swift adaptation of inspection solutions as threats evolve. Just as the owners of smartphones or electric vehicles anticipate regular updates and new features, customs authorities can act as a community to focus on desired outcomes, rather than rigid specifications, demanding continuous improvements to inspection capabilities. Selecting vendors open to an iterative, open architecture approach reduces risks, safeguarding both investments and reputation.

In conclusion, the "system of systems" approach offers a remarkable opportunity to redefine how we approach national security, trade facilitation, and international cooperation. The time is ripe for embracing this approach, leveraging modern software-centric business models, and innovative procurement methods. This strategy not only fuels progress but also aligns with national agendas, stimulates local industry growth, and creates new export opportunities. By drawing inspiration from technological advancements in other sectors, we can pioneer an efficient and effective model for driving innovation, accelerating trade and ensuring our national borders remain secure against all threats.

Paul Hollingshead is the Vice President of International Strategic Partnerships at S2 Global responsible for strategic business development and the deployment of the S2 Global product suite to international customers. With a history of leading regional growth at Anduril Industries and strategizing border security at Rapiscan | AS&E, Paul has been solving complex security and defence issues throughout his career.

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