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# INFOSECURA

## From Seville to Dublin

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MARCH  
2018**



A magazine for the security printing industry worldwide, published four times a year by Intergraf in Brussels and mailed to named members of the security printing community, such as security printers, their suppliers, banknote issuing, government and postal authorities as well as police forces in more than 150 countries.

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## Much to say about Seville



From the feedback received both during and after the Intergraf Security Printers Conference and Exhibition in Seville in October, Intergraf can with satisfaction state that it was not only a very pleasant event, with great weather in a lovely city, but a very successful one as well. Particularly the increasing representation from governments and central banks was noted and the quality of the papers delivered. We had more highly interesting papers than any single delegate could manage - as there were parallel sessions for banknotes and passports even the most dedicated ones could not be in two places at the same time. The controversial key note speaker David Birch certainly set the tone of the conference to be lively, challenging and thought (or reaction) provoking.

We cannot even attempt to give a short synopsis of presentations given to inform those that could not make it to a specific presentation. Instead we give a little more space to voices we heard in Seville and to one or two papers that caught our attention. The infographic on page three gives more details about the numbers at the conference. Attendance figures and the quality of the attendees as well as that of the papers given were excellent. Intergraf will build on this for another successful conference on 21 to 23 March 2018 in Dublin. But this issue is mainly about Seville.

The Editor

## A LONG LOOK BACK - WITH AN EYE ON THE FUTURE

**At the end of the Intergraf Security Printers Conference and Exhibition in Seville, the conference chairman Efthimios Matsoukis announced that he would retire from the chairmanship of the Committee of Experts, handing over his duties to Dr. Dieter Sauter, Managing Director of Orell Füssli Security Printing Ltd. InfoSecura's editor spoke with Mr. Matsoukis in Athens.**

When he joined Intergraf's Security Printers Committee in 1991, which at the time was called the organizing committee, having a broader and more detailed task than today, the members represented well-regarded security printers but not the top companies of the industry, such as De La Rue and Giesecke & Devrient, etc., recalled Efthimios Matsoukis in a wide ranging conversation with Intergraf's editor. The top echelon was still organized in a differently structured "club", called AIIF, which some years later closed. The Intergraf organizing committee chairman at the time was Ferdinand Count Waldburg, who worked hard to provide a meeting space for all security printers, banknote printers as well as passport and ID printers. This "universal representation" of security printers was the original formula for the conference, which has meanwhile been examined and re-examined and confirmed every time as being the best and most inclusive way to provide for an exchange of ideas and knowledge between all branches and all players of the industry.

### THE BEGINNINGS

Efthimios Matsoukis had come to the committee to help organize the 1991 conference in Vougliameni near Athens. Although his company, Alex. Matsoukis Security Printing (now Veridos Matsoukis S.A. Security Printing), was





Efthimios Matsoukis, chairman of the Committee of Experts of the Security Printers Conference and Exhibition from Montreux in 2003 until Seville in 2016

which he served as General Secretary from 1985 to 89 and the involvement in Intergraf helped to open the Greek printing industry to the European family, creating stronger personal and business bonds. When he joined the committee, the Intergraf International Security Printers Conference was the only one of its kind and the only non-profit conference (it still is), but it still lacked the full support of the big banknote printers. That support came only when the AIF ceased to exist and the large security printing companies saw the advantages of participating in the Intergraf conference. Mr. Matsoukis' first conference in Greece was also Intergraf's first to host an exhibition alongside the conference, a fact that contributed much to the growth and appeal of the event. The first exhibition was quite a modest affair with explanatory panels only. But it grew rapidly into a fully-fledged exhibition, creating a virtuous cycle benefitting printers and suppliers alike. However, Mr. Matsoukis insisted, the conference never became an appendix to the exhibition. The conference always staid as the main, defining event. The exhibition now regularly attracts over 100 exhibitors.

In 2000 Count Waldburg stepped down from the committee chairmanship. He was succeeded by Johan Wotte of Royal Enschede, who brought much technical expertise to the committee. He subsequently had to relinquish his post when he retired in 2003. Efthimios Matsoukis' chairmanship began at the 2003 Security Printers Conference in Montreux, Switzerland, enabling him to preside over a string of ten successful and growing conferences, reaching 1020 participants in 2010 in Barcelona. Attendance figures have now settled to around 850. More conferences have come up and there is now competition on international as well as on regional level. However, Mr. Matsoukis points out, Intergraf and the Committee of Experts has brought more than just conferences and exhibitions to the industry.

#### BEYOND CONFERENCES

Under his leadership and that of the Intergraf

a prominent company in Greece, with a close relationship to Germany's Giesecke & Devrient and a clientele extending well outside Greece, joining the Intergraf committee broadened not only his international perspective but that of his company as well. The company had been active in the Greek Printing Federation, of

Secretary General, Beatrice Klose, a new standard for the management of security printing processes was developed and internationally recognized as CWA 14641, later transposed into ISO 14298. This work had become necessary, Mr Matsoukis recalls, after Eastern European security printers entered the world markets and needed to prove to their customers - and their peers - that their businesses had the same level of security and management competency as their longer established competitors. But established companies all over the world quickly saw the advantages of certification as well. CWA has also been extended to suppliers of the security printing industry and and Intergraf has currently certified over 100 companies in 44 countries.

The Committee of Experts, as it is now called, also expended much time and effort in refining the format of the invitation-only High Security Printers Meeting. The meeting goes back to the early days of the conference enabled participants to discuss more confidential subjects. Mr. Matsoukis is proud of the fact that a continuous updating of rules regarding eligibility to attend ensures the perfect balance between security printing customers such as governments, central banks and law enforcement and the printing companies providing security solutions. Especially successful, he thinks, was the decision to split the event into separate meetings for banknote production and passport and ID production, with only a single joint session and common lunch and coffee breaks to emphasize the unity of the industry. This gave delegates much more time devoted to their respective specialities.

Another major function of the committee is to ensure a close and constructive contact with the diverse institutions, companies and personalities that make up our industry, with the aim that any changes and advances, both technically and economically, are reflected in the programme of the conference. It is this task that Efthimios Matsoukis saw as one of his main responsibilities.

#### THE FUTURE CHALLENGE

Security printing has become a high-tech industry, Mr. Matsoukis said, but it is technology that will pose the greatest challenge for its future. The industry will have to adapt in a more and more digital world. It has shown in the past that it has the capacity to do so. But technology is also an opportunity. Security printing will move from a capital-intensive industry to a "brain-intensive" one. And as it has the brains, it will succeed. From his vantage point in Athens, the world's early intellectual centre, Efthimios Matsoukis will confidently continue to watch the industry's fortunes. ■



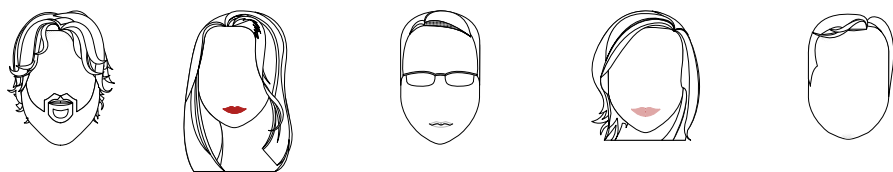
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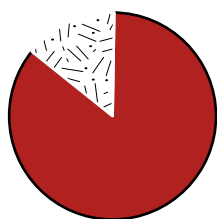
## 880 DELEGATES

INCLUDING 40% FIRST - TIME ATTENDEES  
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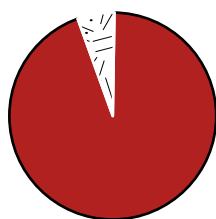
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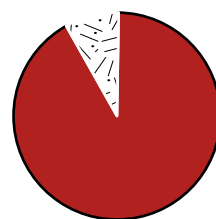
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81% ■ MADE GOOD AND EXCELLENT BUSINESS CONTACTS



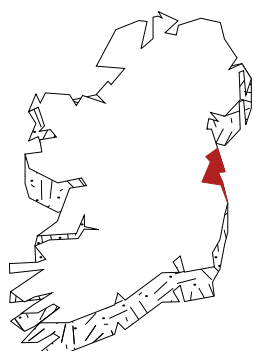
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93% ■ SAY IT WAS A GOOD INVESTMENT



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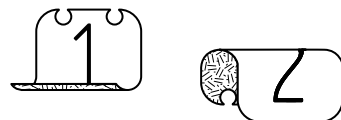
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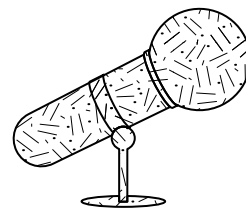
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# DUBLIN

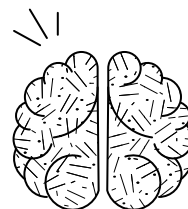
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3 DAYS OF SHARING KNOWLEDGE AND  
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SECURITY TECHNOLOGIES



66 EXPERT SPEAKERS



1625 MINUTES OF BIG IDEAS

## 100

EXHIBITORS



## Voices from Seville

What is the greatest challenge to banknotes now? This was one of the questions we put to a number of selected delegates at the Intergraf conference

Conferences offer a means to transfer knowledge and opinions from speakers to the audience. But that is only half of the story. Just as important is the exchange of knowledge and opinions between delegates. Intergraf's Security Printers Conference and exhibition in Seville from October 5 to 7 and the High Banknotes and High ID Meetings on the preceding day gave ample opportunity for exchanges in any direction. The whole event also offered the editor the opportunity of talk to some key delegates and speakers and compare their answers to some simple questions.

### THE GRAND VIEW OF THE INDUSTRY

Asked of what he sees as currently the greatest challenge to cash, Eric Boissonnas, CEO of KBA NotaSys said that there is a lot of false information about banknotes swirling around, which the industry has to try to correct. It has been said that (in industrialized countries) only 15 per cent of banknotes issued are truly in circulation, implying that the remaining 85 per cent are used for criminal purposes and for tax avoidance. That is wrong, Mr. Boissonnas insists. The "missing" 85 per cent are in the cash cycle, or locked away in safety deposit boxes in banks, hidden under mattresses, etc. (The fear or the reality of negative interest rates makes this quite understandable.) The proportion used for criminal purposes is very small. However, banknotes have to address this issue. If a country abolishes its banknotes, people will not only use cards but alternative currencies or payment means which are much harder to control. A cashless society will not make the black market disappear. Banknotes have many positive sides, which have to be more clearly explained to the population.

Asked about the way, banknotes will need to develop in the short to medium term, Mr. Boissonnas thought that some banknotes have become too complex. They should become more simple, and easier to understand, perhaps with fewer but more recognisable security features. Anonymity was another key word the industry should think about. In a decision whether to use cash or cards in a purchase, anonymity plays a very minor part, convenience is a far stronger deciding

factor. Mr. Boissonnas said he was not sure that people in the street would have a problem if cash, or at least high denomination notes, would become traceable - perhaps not completely, but to a certain limited extent. Banknotes may well develop in this direction. Linked with these questions, the decision of the European Central Bank to phase out the € 500 note and the pressure on many other central banks to eliminate high denomination notes was purely political, as was the decision by the Swiss National Bank to continue issuing the Sfr. 1000 note. The SNB used this issue to clearly differentiate itself from the ECB.

### A VIEW FROM THE PRINTING WORKS

The heads of central bank printing works asked had a slightly narrower view of the challenges for banknotes. Erick Lacourrége, General Director of the Banque de France said in response to the question of what currently is the greatest challenge to banknotes, that there is in fact a two-pronged challenge. Although cash is growing in developed countries on average at 5% per annum and in developing countries at twice that rate, there is strong bias against cash on the part of the banking industry and, to a certain extent, from government as well. There are several well-rehearsed reasons for this. Banks see cash as a cost and governments see it as a means of tax avoidance, fuelling the black economy, organized crime, etc. He thinks there is little evidence that this assertion is correct. However, this attitude will eventually lead to a reduction of the market share of cash. The pace in which this is happening is different in different countries and regions, e.g. in the Nordic countries the move away from cash seems to be very strong, but also we see the same phenomenon, perhaps less pronounced, in France, while in Germany, cash seems to be much stronger. It is a cultural question. In France, Mr. Lacourrége said, cash is used most often for smaller purchases, while for larger ones, cards are preferred. Whatever the use of cash is in the different countries, it is still very much part of the established payment system. And cash is still very much trusted and with good reason. Although banknotes evidently have been and still are counterfeited, most people have never come across a counterfeit note. Card fraud, by contrast is much more common. Mr. Lacourrége said that he thinks the ratio of counterfeit banknotes to card and other payment fraud is one to ten in favour of banknotes. However, figures about card fraud are not generally known by the public and the card industry is very anxious to keep these figures secret in order not to undermine the trust in cards.

Asked in which direction cash will – or should – develop, Mr. Lacourrége said that the production of cash has to become more cost effective. The



industry will more and more use technical solutions that do not come from within the banknote industry but form outside. This means that the industry should shed its insularity and become more open to outside influences.

Openness is good, but on the other hand the solutions the industry comes up with, regardless of their origin, need to be exclusive to the industry in order to guarantee security and perhaps also to reduce costs. Tailoring substrate to the usage patterns of banknotes is also a cost effective solution, as e.g. is practiced by the Bank of Mexico, which uses polymer for low denomination, high circulation notes, strengthened cotton banknote paper for medium circulation notes and standard cotton banknote paper for high denomination notes. Mr. Lacourrége on behalf of the the Banque de France, had introduced a new banknote substrate at Intergraf's Security Printers Conference and Exhibition in Seville that aims to increase the life of banknotes in circulation and thus reduce costs.

High-denomination notes will continue to come under increased pressure Mr. Lacourrége thinks, as both governments and the banking industry are biased against cash, if for different reasons. The debate is not settled yet. The alternative use of payment cards is well established and secured by standards, but the latest alternative payment methods, such as payments by Smartphone, are neither secured by regulations nor are there standards in place to guarantee interoperability. This technology has not yet reached a high level of acceptance, but before long, standards and regulation will have to be introduced, especially in the light of the frequent updates, Smartphone operating systems are subjected to. Compared to the use of cash, payments by mobile phones face many challenges.

Julio de Ancos Morales, the CEO of the newly established Spanish Euro banknote printer IMBISA defined the biggest challenge to banknotes today more in terms of competition and commercial considerations. He said that as a printer of the second series of Euro banknotes he needs to be very competitive, especially if, as he thinks, volumes will decrease. There is a real need to reduce cost for raw materials and for labour across the board. The reason is that there is more than enough capacity in Europe to produce the volume of Euros needed and it is not only the printing works linked to central banks or the state that are ready to fill the quotas, but private banknote printers as well are part of the competition. IMBISA has an additional problem in that the company was formed out of a publicly owned entity, the FNMP RCM and there is a challenge to change the work culture within the

new company, which Mr de Ancos Morales wants to operate like a company in the private sector.

Asked how banknotes, and especially the Euro will develop in the future, Mr de Ancos Morales again pointed to cost. The cost for raw material should come down, especially that for paper not least because a significant part of the cost of producing the Euro is made up of the cost of security features. But reducing the cost of the substrate without compromising security is also a very difficult thing to do, especially as the paper in the new series is three times as expensive as the paper in the first series, he said. Raw material is supposed to make up 45% of the production cost of the Euro banknote and if the cost of raw material goes up steeply, even if labour costs do not change, keeping the Euro within a desired cost range will be very difficult.

When the ECB announced that the €500 note would no longer be printed, printers expected that the print run for e.g. the €50 would go up. But that has not happened. However, the final decision has not yet been announced.

Regarding the competition to cash from alternative payment systems, Mr. de Ancos Morales said that he expects that these alternative payment systems will take about 7 to 10 per cent of the current volume of banknotes. The use of cash is a cultural question and Mr. de Ancos Morales said that Spaniards do not like the idea that their spending habits could be monitored, as happens with cards or with mobile payments. This does not mean that people in Spain bypass the banking system. It is not common in Spain to keep cash under the bed, cash is kept in bank accounts, but on the whole, Spaniards are not great savers, they prefer spending.

#### AN ASIAN COUNTERBALANCE

To balance these views on the question about the future of cash with a view from outside of Europe, we talked to Ravi Kumar Sesha Murthy and Dangeti Kukkuteswara Rao, both Deputy General Managers at Bharatiya Reserve Bank Note Mudran in India and to Manoj Malpani, Chairman of Infinity Security Paper in India. Mr. Malpani said categorically that India cannot become a cashless country, at least not within the next 40 years.

India is a vast country and 70 to 80 per cent of the country is still rural, BRBNM's Mr Murthy said. Many rural people are poor and with a monthly income of perhaps \$200, they only make small purchases, and all of them in cash. The rural population clearly prefers cash. Although the urban population is growing and there is therefore some card use, the majority of purchases, especially small ones are made with cash. India has growth in cash of



10 per cent p.a. In urban areas there is growth in card payments as well, but overall, 90 per cent of all transactions are in cash. Cards are used mainly to withdraw cash from ATMs. As India has a vast network of ATMs, cash is very much entrenched. Also, many people still have no bank account, which means no access to payment cards. Mr. Murty estimates that cash will remain the clear favourite for the next 40 year, at least.

India prints about 24 billion banknotes now, a figure that is set to rise to 30 billion in the near future. India

has four banknote printers, two belong to BRBNM, owned by the Reserve Bank of India and two belonging to the Ministry of Finance. As proof of the belief of the Indian authorities in the future of cash, a new printing facility has come on stream last year in Mysore and India has also increased its banknote paper capacity significantly. Production costs are of course a factor and BRBNM is trying to prolong the circulation life of banknotes by adding varnishes and other means. There had been some thought of using polymer for some denominations, but after some tests that idea was dropped. ■



# Cash skirmishes

Cash is being discussed by the public. Does the industry have the right arguments in its favour?

There is a lot of false information about banknotes swirling around, which the industry has to try to correct, said Eric Boissonnas, CEO of KBA NotaSys in an interview with Infosecura's editor. The industry is certainly trying. There is the newly founded International Currency Association, which is dedicated to fighting for cash, there are companies, such as Giesecke & Devrient that have distilled arguments for cash into excellent publications, such as "Why Cash Matters", and Agis Consulting, that produced a comprehensive set of arguments in the brochure "Cash Essentials" - there is also a very informative online magazine of the same name - and there are conferences dedicated to the promotion of cash. All these efforts are commendable and need to be continued and even increased. But how certain are we that we are not only preaching to the converted but reach the everyday users of cash and alternative payment methods?

## ON THE ATTACKING SIDE ....

The general press and even some high-brow magazines do publish articles about banknotes - some in favour, some against and many that strive for a balanced view. Cash is certainly in the news - not in the headlines, but it is being talked

about extensively. One of the most serious and vocal critics of cash is Kenneth Rogoff, professor of economics at Harvard University in the US and the former chief economist of the International Monetary Fund. Rogoff uses the well-worn arguments against cash, that it encourages tax avoidance, enables criminality and generally keeps the black economy afloat. In his new book "The Curse of Cash" he does not actually advocate the abolition of cash, which he admits will be unlikely, he rather aims to make cash irrelevant. In a linked article in the UK's The Guardian (5 September 2016) entitled "Why cash isn't king anymore" he claims that central bank surveys show that only a small percentage of large-denomination notes are being held and used by ordinary people or businesses. The rest, he implies, is presumably used to facilitate crime or tax avoidance. That is a difficult claim to prove. When banknotes are returned to them, central banks see how many high denomination notes come back. But to infer from the low number of returned high denomination notes that not ordinary people but criminals and the black economy are using these notes is reckless, to say the least. Interest rates, that are close to or at zero per cent in many countries are a more convincing reason. Also, prominent currencies such as the US Dollar and the Euro are held widely in countries all over the world to give people a final reserve in the face of dodgy banking systems or precarious economies.

Rogoff favours a very gradual phasing out of large notes, while leaving small notes (\$10 and below) in circulation indefinitely. This would divide money into "serious" (digital) money and the frivolous, easily spent kind, with banknotes being the latter. There then would be a point at which it would be no longer economically sensible to develop, print and issue banknotes, let alone sophisticated new substrates and security features.

## PLAYING FOR THE DEFENCE....

*"If there is a curse between the covers of this thin, self-satisfied volume, it doesn't have to do with cash, the title to the contrary notwithstanding."*



*Freedom is rather the subject of the author's malediction. He's not against it in principle, only in practice",* writes James Grant, editor of Grant's Interest Rate Observer in an article published in the Wall Street Journal (Hostage to a Bull Market, September 9, 2016). He is shooting at Prof. Rogoff from the right - much of the other criticism is from the left. Grant strongly condemns Rogoff's premise that the Federal Reserve should be able to put interest rates to minus one, two or even three per cent, to get people to take money out of their bank accounts and spend it, thus aggregating demand and prosperity. That idea would flounder of course, as long as there is still cash around.

Among Mr Grant's many arguments against negative interest rates, one stands out: *In a world of 2 per cent long-dated Treasury yields, pension managers operate under the fanciful assumption that they can, on average, generate annual returns in excess of 7.5 per cent. Just how America's income-starved savers and pensioners would receive the news of the adoption of negative interest rates could be a fruitful topic for Mr. Rogoff's next book; it plays no part in this one.*

The article finishes on this note: *"Mr. Rogoff's brief is best seen not as detached scientific analysis but as a kind of left-wing crotchet. Strip away the technical pretense and what you have is politics. The author wants the government to control your money. It's as simple as that."*

The fight for cash is by no means a conservative American or European preserve. The left of centre UK daily "The Guardian" notes that by 2025, three quarters of payments in Britain are expected to be made without notes or coins. In the last financial year more than 600 UK high street bank branches closed, which is bad news for the elderly and those that can't travel, but even worse news for people working in them, the paper said. A cashless society can move all financial matters onto the Internet and do away with brick and mortar banks entirely.

Apart from every electronic transaction being traceable, a cashless society would require absolute trust in banks. *"When Cyprus's banks teetered on the cliff of financial disaster in 2011, we saw bail-ins. Ordinary people's money in deposit accounts was sequestered to bail out the system. If your life savings were threatened with confiscation to bail out a corporation you considered profligate, I imagine you too would rush to withdraw them"* Dominic Frisby wrote in "The Guardian". *"Small businesses starting out need the cash economy. Poor people need the cash economy. The war on cash is a war on them."*

And there are other effects of life without cash. Although it makes it difficult for 'illegal' immigrants to survive, surely a vote-winner in some countries, for every one of the 'illegals', there will be homeless or otherwise marginalised local citizens struggling to get by without smartphones and bank accounts. And linking cash and migrants, or refugees or immigrants, call them what you will, is no trivial point, considering the number of displaced persons around the world. There are 4.4m registered Syrian refugees scattered across Turkey, Lebanon and Jordan, 90% of whom live outside refugee camps, making the distribution of food aid extremely difficult for agencies such as the World Food Programme (WFP). The agency found a solution by switching to cash, which is transferred to cards that can be used to buy food. Now just over a quarter of WFP aid globally is cash-based. The EU recently launched one of its largest humanitarian-aid projects in Turkey: €348m for the WFP, will be transferred to electronic cards held by up to 1m refugees.

#### BUYING TRUST - RATHER THAN EARNING IT

Payment cards have been around for quite a while and most people in industrialized countries use both cash and cards. While some on the "cashless" side advocate the abolition of cash, the cash industry certainly has no desire to eliminate cards. Both means of payment are important, but there is surprisingly little information around about the cost of cards. A recent article in "The Economist" (15-21 Oct., 2016) sheds some light.

In the USA, credit and debit card purchases typically attract a processing fee, called an interchange fee, of between 0.5 and 3 per cent of its value, payable by the merchant. In Europe, the figures will be broadly similar. In 2015 merchants in the US alone paid over \$ 40 billion as interchange fees to the card issuers, the banks, and the payment-card networks, such as Visa and MasterCard which set the fees. Some portion of these fees is borne by consumers, including those who pay by cash, in the form of higher prices. Many banks rely on card fees for much of their income. They and the payment-card networks argue that the level of fees is justified to cover the cost of processing payments and combating fraud. The card industry does not publish figures about the cost of fraud, but as interchange fees are going up, it must be substantial, as the loss by card fraud to the card-holder is fully absorbed by the payment institution. If the true extent of card fraud were known, customers might think a little more which payment mode to use.

In recent years the card industry has acquired a new competitor, mobile payments via mobile phones. Here the players are not financial but



technical companies. Apple for example wants to “wean the world off cash”, according to its CEO Tim Cook, preferably in favour of using the Apple Pay app to buy everything via their smartphones. Google has a similar scheme called Android Pay and there are other tap-and-pay payment systems. Their main attraction for users is convenience and as often no pin number is necessary, contactless purchases are typically limited to a relatively low amount per transaction. Europol’s annual “Internet Organised Crime Threat Assessment Report” warned that “*organised crime groups are starting to manipulate or compromise payments involving contactless (NFC) cards*”. It seems that especially Android phones are used to trigger fraudulent tap-and-go payments, but the police are unsure exactly how the attacks are being carried out and how common they are.

Among the arguments for cash, safety is an important one and comparing with alternative payment systems, banknotes tower above all other. But one argument is not enough, we must use all of them and direct them at the people that count: the general public. ■

Tallberg’s organization have joined *Kontantupproret*, “Cash Uprising,” a loose coalition for the preservation of cash founded by Björn Eriksson, a former president of Interpol. Cash Uprising believes that everybody should be able to get and deposit cash anywhere. Even in Sweden, Cash Uprising is not totally exotic. “When I speak with an organization, this is actually one of the key topics, the key frustrations, that they’re very angry about,” says Jan Bertoft, the secretary-general of the Swedish Consumers’ Association, a federation of twenty-four groups, including retirement, disability, and immigrant organizations. The Uprising publishes editorials that are critical of what Eriksson calls “this abnormal way of making it as difficult as possible to use cash out of the pocket.” At first, it tried appealing to the banks, but they were not interested. So the Uprising petitioned politicians, among them Sweden’s deputy minister of finance, Per Bolund. In late June, Christina Tallberg handed him a petition, signed by 139,064 pensioners, asking the government to safeguard the use of cash. Bolund seems to favour persuasion over regulation. “I will have a dialogue with the private sector, trying to point out that they have a responsibility for giving payment services for all citizens.”

## CASH RESISTERS

**Even in Sweden there are opponents to the move towards a cashless society and in the UK, in some areas, access to cash is sorely missed**

The situation about cash is broadly similar in industrialized countries with the everyday use of cash declining and the number of large denomination banknotes increasing. Usually Scandinavian countries, and especially Sweden, are seen as being in the forefront of the transition from cash to - well, something else. But even in Sweden, living cashless is becoming the norm only in urban areas and especially in the South, while in the more rural North there is resistance. Cash use is also a question of wealth and age. As about half the country’s banks don’t allow deposits or withdrawals of cash, closing or de-cashing of bank branches changes daily life. Locals, especially those with cash-intensive businesses, like shops, now drive great distances to find a bank that lets them deposit their cash takings, complains the *Småföretagarnas Riksförbund*, or National Small Business Association, which represents thirty thousand firms, writes *The New Yorker* in an article about the cashless society.

Increasing cashlessness affects the elderly most. Many struggle to track debt, don’t like smartphones, and forget the PIN codes needed for their bank cards. And many are members of the *Pensionärernas Riksorganisation*, or National Pensioners Organization headed by Christina Tallberg. *Småföretagarnas Riksförbund* and

Swedish small businesses are not the only ones complaining. In a report entitled “Locked Out: The impact of bank branch closures on small businesses”, published in October, the UK Federation of Small Businesses (FSB) claimed the productivity of companies was being hindered by banks shutting down. The report is not directly about cash, but points at problems with bank branches and ATMs. However, FSB points out that in spite of an increasing range of payment methods used by small businesses, cash is still vital to the operation of many local economies. “There have even been several instances of villages and towns literally running out of money during peak periods of economic activity,” the report said, giving the example of Glastonbury in Somerset, which lost four bank branches between 2014 and 2016.

The FSB, which represents over 5 million firms in the UK, said businesses feel “locked out and let down” by high street banks, which are abandoning towns and villages around the country. The FSB said: “In the last 25 years, the total size of the branch network has halved to just over 8,000 branches and is set to halve again in the next ten years”.

Last year, the banking industry agreed to a protocol requiring it to publish impact statements with information on counter usage, regular customers and the location of the nearest alternative bank, cash machine and post office. The FSB said a strengthening of this protocol was urgently needed. ■





At Intergraf's 2013 High Security Printers Meeting in Vienna, Dr Wolfram Seidemann of German papermakers Louisenthal put forward the idea that all substrates for banknotes that were available at the time have a place in the arsenal of central banks, but they fulfil their role best if used for different purposes. Banknotes need to be functional in a large variety of climatic environments and different habits of cash handling - from carrying banknotes in wallets, to stuffing them into pockets or even shoes and from spending them at market stalls or luxury shops. They have to cope with different situations in the cash cycle, in note accepting and dispensing machines, and they need to be suitable for transport and verification systems of high volume cash handling processes. To illustrate the differences in usage, Seidemann divided banknotes into low denomination market notes, middle denomination transaction notes and high denomination saving notes.

Low denomination banknotes don't need optimal security features, and high denomination banknotes, which are often used as a store of value and have lower circulation, don't need durability embellishments, with transaction notes somewhere in the middle.

#### PAPER AND ITS COMPETITORS

At the time he spoke there were several different substrates on the market. There was of course cotton paper and Guardian polymer substrate. The year before, De La Rue had added to the polymer range with its own polymer development called Safeguard. The search by the Swiss National Bank for a durable substrate that had the traditional paper feel, led to the creation of Durasafe, made by Lanqart, a multi-layer product consisting of a top and bottom layer of paper and a polymer layer in the middle. Before Durasafe made its debut, Louisenthal came onto the market with another multi-layer substrate, Hybrid, which has a polymer layer on the top and the bottom and a paper layer in the middle. Three years later, at the Intergraf

Security Printers International Conference and Exhibition in Seville, the Banque de France presented its variation on the multi-layer substrate theme.

Like Hybrid and Durasafe, EverFit, as the new concept is called, is a multi-layer product, said Erick Lacourrège, Director General of the bank's banknote manufacturing division, who introduced the BdF's latest banknote product. He described the three factors that define durability of banknote substrates: resistance to ink abrasion and colour fading, resistance to mechanical stress and resistance to soiling. Comparing paper and polymer, paper is an open and porous material that has limited soiling resistance and mechanical resistance. Polymer has excellent soiling resistance but the ink and substrate interface causes limitations in term of ink and security feature abrasion resistance. The point he was making was that a single material cannot address all durability requirements of a banknote.

Multi layer technology has become much talked about and researched in the last 15 years. It is used in several applications, among them packaging, and the properties focussed on in research and application were mechanical properties and stress resistance, friction and wear and adsorption, permeability and barrier properties. These attributes are also crucial for banknotes and multi layer technology was shown to have great potential to address durability requirements of banknotes. The first application of multi layer technology in banknotes, with a combination of paper layers and a polymer layer, appeared in 2008.

Using the findings of multi layer technology, Banque de France developed a concept for a new multi layer banknote. In contrast to other new substrates, EverFit consists of a fully printed note, including all security features. Special polymer films are laminated onto both surfaces, to protect the printing and security features from abrasion and to protect the banknote from soiling. The combination of the paper core and the added polymer films provides high mechanical resistance.

The EverFit concept is based on three main ingredients: a special 72 gsm paper, developed for banknote durability, a specific polymer film with superior adhesion and a dedicated process fully meeting banknote industry standards. The combined thickness of paper and polymer films is 115 µm or 112 gsm. The intended use of the substrate is for low denomination banknotes that are subjected to aggressive situations regarding climate and user behaviour.



In mid-2014, the first circulation trials of the first version of the product were held in Madagascar and in March 2015, three denominations were issued as a test by BEAC, the Central Bank of Central African States. At the end of the same year a second issue of Madagascar 500 Ariary notes on an improved version of EverFit was released. A monitoring protocol was set up with the Central Bank of Madagascar in order to analyze the behavior of the EverFit notes in comparison with standard varnished ones and at the end of the same year another circulation trial was held in Burundi with BIF 1000 notes.

Comparison of soiling resistance after 6 months in circulation: mean whiteness of Everfit notes (top left), mean whiteness of varnished paper notes (top right), lower whiteness of Everfit note (bottom left), lower whiteness of varnished paper notes (bottom right)



In the batteries of tests, EverFit showed remarkable resistance to soiling. After 6 months in circulation, EverFit notes remained 100 per cent fit for circulation, while paper was 57 per cent unfit and 43 per cent fit after 6 months. Similar results were obtained for mechanical fitness, which after 6 months circulation showed that 4 per cent of the EverFit test notes were unfit for circulation, 13 percent were fit and 83 percent super fit. (Varnished test notes were 21 per cent unfit, 44 per cent fit and 35 per cent super fit).

Resistance to abrasion: top, EverFit note, bottom, varnished paper note



As for ink abrasion resistance, the construction of the multilayer protects inks and security features. Especially, intaglio tactility is almost not affected by a ball abrasion test, unlike all other substrates. EverFit is also a good answer to colour fading, which is the direct consequence of ink abrasion.

An inherent risk of multilayer materials is delamination. In banknotes, delamination may be the consequence of penetration of liquids and grease through the edges of the note, which are not protected. This phenomenon occurred on a certain quantity of banknotes during the first circulation trial of EverFit between the print surface and the protective polymer film. Nevertheless, security features and prints were not affected. An improved version of EverFit has been tested in Madagascar, focused on delamination resistance. Delamination phenomenon have been drastically reduced to some very isolated cases (< 1%).

The EverFit lifespan is characterized by a fit-rate of 100 percent after 6 months circulations and 75 percent after 12 months. 100 percent of the notes are fit for automatic sorting after 12 months and the total life expectancy is over three times that of varnished paper notes, with no ink abrasion and no colour fading, with a noticeable improvement of bank notes in circulation.

Banque de France and KBA NotaSys are currently developing a machine, the NotaLamina, specifically developed for the production of EverFit notes. The first NotaLamina will be running in mid 2017 and and it will be available on the market as of mid 2018. The Banque de France has also developed a partnership with a manufacturers of polymer laminates, Taghleef Industries.

The Banque de France intends to share the technology with the banknote industry. The paper formula, developed to ensure banknote durability and a strong adhesion with the polymer film can be shared with any paper mill interested in EverFit production: licensing and know-how transfer are available on demand. The specific polymer film can be supplied from Taghleef Industries to any printing works and Banque de France can provide technical support and grant a license to any printing works interested in EverFit and fulfilling production and quality requirements.

EverFit is designed to provide a strong answer to durability issues in aggressive circulation conditions, soiling, mechanical stress and color fading. It is a very suitable solution for low denomination banknotes and it will substantially increase the lifespan of banknotes, allowing issuing authorities to significantly reduce issuing costs. ■



## THE VALUE OF COLLABORATION

**The Central Bank of the Bahamas used the tender process for banknote procurement to find the optimal design for a new series from one vendor, while awarding the execution to another. The result is impressive.**



The new B\$10 note, the first of the CRISP Evolution series, designed by Orell Füssli and printed by De La Rue. The new Active thread is on the back.

(right) The first CRISP series for comparison.

There was a lot of talk about banknote procurement at Intergraf's Security Printers Conference and the Banknote High Meeting in Seville in October. The Deutsche Bundesbank gave a lecture on this subject and De La Rue talked about the changing world of banknote procurement. But one of the most exiting papers came from a tiny nation in the Atlantic, to the South-East of Florida: the Bahamas.

The Bahamas may be small with only about 400 000 inhabitants, but the country takes pride in its economic position and in its currency. The biggest money-makers in the country are tourism and the financial sector and fittingly, banknotes demand a lot of attention. The number of notes in circulation grew from about \$300 million in 2006 to over \$360 million in 2015, while counterfeits went from about 5 ppm in 2006 to 2 ppm in 2015, peaking at around 22 ppm in 2007 and 2008. The Central Bank of the Bahamas issues \$1, \$5, \$10, \$20, \$50 and \$100 notes, which are on a par with the US Dollar.

The country, which gained independence from Great Britain in 1966, established the Central Bank of the Bahamas on 1974 and issued the first series of Bahamian dollars in the same year, printed by a single supplier, De La Rue. All denominations had common basic features and all had - and still have - the same size. Counterfeiting was relatively low in those days and done with rather unsophisticated technology. The notes used intaglio rather heavily, but no features that would prolong their life,

although the climate in the country is not kind to banknotes. Consequently the lifespan was short, from three to seven months.

The second generation of banknotes, from mid 1990 to mid 2000, still used intaglio heavily, but there were now several suppliers, the quality and with it the life expectancy had improved to six to 16 months. However, counterfeiting grew in numbers and quality to 22 ppm and as basic features were common to all denominations, uprating of \$1 to \$100 became a common counterfeit ploy.

### FIGHTING COUNTERFEITING WITH CRISP

In response to the high incidence of counterfeits, in 2005 the CRISP (Counterfeit Resistance Integrated Security Product) series was issued. Within the CRISP family each denomination is subtly different and each one is designed and printed by a different producer. The lifespan of the notes increased significantly, doubling in the case of the \$1 and \$5 notes and trebling for \$100 notes. CRISP was the start of a new family strategy for Bahamian banknotes. There would be a fresh design every ten years, which, apart from the artistic considerations would concentrate on innovation and new techniques and on longevity and counterfeit resistance. The design should prioritize simplicity and user-friendly features.

In 2013, the Central Bank of the Bahamas opened a tender for the concept, the design and printing of the \$10 note for 2015. Because of having worked with them earlier, De La Rue and Giesecke & Devrient were invited to tender and because the design of the new Sfr 50 note appealed to the Bank, Orell Füssli was invited as well. The winner in the tender process for the design was Orell Füssli, however De La Rue's production proposal was favoured overall. A focus group described the Orell Füssli note as thoughtfully designed and thoroughly researched. It also ushered in a further step of the CRISP concept: CRISP Evolution.





While Orell Füssli provided the design, De La Rue translated the design concept into a printable note, 'tweaking' some design elements, such as the 'butterfly' with their Orbital optically variable colour based on Sicps's Spark and added the company's new 'Active' lenticular security thread on the back of the note. The B\$ 10 is the first note in circulation to carry this tread.

Instead of the traditional portrait of the Queen, the new note shows the picture of Sir Stafford Sands, a former Finance Minister, who supported the important tourist industry. De La Rue also designed promotional and educational campaigns for the new note in order to educate vendors and the public about the new features well in advance of the issuing date. ■

## AN INDIAN SURPRIZE

**In an abrupt move, India withdrew all existing RS 500 and Rs 1000 notes from circulation. This represents 86 per cent of all banknotes in circulation in India. Many Indians were left in the lurch.**

In a move that baffled just about everyone in the country, India's Prime Minister Narendra Modi announced in a surprise television address on Tuesday evening, November 8, that from that midnight on, 500 and 1000 rupee notes would be taken out of circulation. (Rs 500 is worth €6.80 - \$7.40 and Rs. 1000 €13.60 - \$14.80) Modi said: "The exchange of 500 and 1000 rupee notes being tendered as currency will be stopped from today. Black marketeers and traitors who use black money will not be able to move large amounts of money and 500 and 1000 rupee notes will become worthless pieces of paper. Those citizens earning honestly and with hard work, their interests will be protected." A new redesigned series of Rs 500 banknote, and a new denomination of Rs 2000 banknote is in circulation since 10 November 2016. Redesigned Rs 1000, Rs 100 and RS 50 are expected in the coming months.

According to Government sources, the move was designed to reduce corruption, tax evasion, prevent terrorist financing and to curb the circulation of fake currency. India has indeed a thriving black economy, said to be accounting for about 20 per cent of GDP, but the country is still largely rural, and small farmers and small merchants usually do not keep formal accounts.

On the day following the announcement, banks and ATMs were closed and as old notes could only be exchanged the next day, many people had difficulties paying for bare necessities, especially as RS. 100 notes proved to be generally in short supply. When the banks opened on Thursday, in cities there were huge lines of people wanting to exchange now invalid Rs. 500 and Rs. 1000 notes for Rs. 100s, and for new Rs 2000 notes or deposit their old notes into bank accounts. Irrespective of the amount people wanted to exchange, a limit of Rs. 4000 per person was set, the remaining amounts were placed in bank accounts.

Another reason the government gave for the demonetisation was to curb the circulation of fake currency, but there seems to be no definite account of the amount of such notes in circulation,

'The Hindu' newspaper said. As per a study by the Indian Statistical Institute, in 2015 at any time Rs. 4 billion worth of fake notes were in circulation in the economy. This is merely 0.025 per cent of the total budget outlay announced for this fiscal year, the paper said. The Indian Statistical Institute's study said that Rs. 700 million fake notes were pumped into the economy every year.

### GO DIGITAL INSTEAD

The Reserve Bank of India said "... the public is encouraged to switch over to alternative modes of payment, such as pre-paid cards, Rupay/Credit/Debit cards, mobile banking, internet banking. All those for whom banking accounts under Jan Dhan Yojana are opened and cards are issued are urged to put them to use. (This) will alleviate the pressure on the physical currency and also enhance the experience of living in the digital world. (Jan Dhan Yojana is a scheme, launched in 2014, to provide the population with zero-balance bank accounts)

Although the government made great efforts for financial inclusion of all sectors of the Indian population, in 2011, out of the 246 million households in the country, only 58.7% had access to banking services. Only 54% in rural India and 67% in urban India were using banking services. World Bank data shows that in 2014 only 53% of adults (age 15+) in India held accounts at financial institutions, far behind China, Brazil and Russia. (source: Scroll. in) Although Modi's Jan Dhan Yojana scheme may have increased the number of bank accounts, especially in small rural villages, having a bank account is not the same as using one.

The move is also part of Modi's efforts to crack down on tax evasion. Under the government's income disclosure scheme, which ended in September, holders of undeclared income were given an amnesty in exchange for voluntarily coming forward and paying 45% tax and a penalty. In August the government passed the goods and services bill, which brought India's 1.25 billion-strong population into a single market for the first time, and amalgamated various state taxes into a single, all-encompassing tax. ■



## THE VIRTUES OF A VIRTUAL PASSPORT

In the last issue of Infosecura we wrote about an idea by the Australian Ministry of Foreign Affairs to develop 'paperless travel documents'. The press got very excited, but the details for public information remained patchy. To shed more light on the issue, we asked the Australian Ministry for Foreign Affairs and Trade (ADFAT) for clarification and also looked at an article describing the original proposal.

The concept of a digital passport began in 2015 when Michael Lynch and Alan Bennett from the Australian Passport Office (APO) put forward a concept to the 'ADFAT Ideas Challenge'. The idea was based on the creation of a virtual passport that a user could authorise to be stored in a secure cloud and used to facilitate travel. They were judged joint winners of the Challenge and the concept was widely reported in the media and even announced by the Minister for Foreign Affairs, as an approach that could go global.

The name given to the concept was the "Cloud Passport" which caused confusion in the minds of some readers who believed that the APO was about to move everyone's passports into the Cloud. Consequently, the concept was renamed to the "Digital Passport" in early 2016.

The idea behind the digital passport is straightforward – and based on international standards. A simplified explanation of the rationale is given below:

All electronic passports or ePassports have chips contained within them and the chips all have the same data structure contained – the Logical Data Structure (LDS). This structure is defined by ICAO Document 9303 and is essentially the same in over 700 million passports worldwide. The LDS contains a Header (EF.COM), 19 data groups (DG1 to 19) and the security objects (EF.SOD). This data is unencrypted but is protected by privacy controls, such as Basic Access Control (BAC) or PACE, and can be validated using Passive Authentication.

In all ePassports, the data contained in the Machine Readable Zone is stored in DG1, while the digital facial image is stored in DG2. Of significant interest are the security objects in the LDS, which include the Document Signing Certificate (DSC). EF.SOD can be used to determine that the ePassport, or LDS, was signed by the specified country, and has not been altered since that signing (Passive Authentication).

This is the essential component – by using the LDS, we can not only provide quality data (in DG1) and a high quality facial image (in DG2), but we can also validate the LDS by using the Passive Authentication, the receiver can establish a level of

trust in the data contained within it. The APO stores the LDS when the ePassport is created and the concept of the digital passport is that the LDS for a client can be made available to Australian border agencies as required to facilitate the movement of Australian citizens across the border.

### THE FUTURE

What does that mean for the future of the ePassport? Will passport books go by the wayside? Will we pull out our phones to cross the border?

The simple answer is that, in the short term, nothing will change. Physical passport books will continue to be produced by every country and we will still cross the border by presenting our passport.

However, there is a great deal of interest in the concept of a digital passport and it is under investigation by ICAO's New Technology Working Group (NTWG). Australia's representative to NTWG is the lead for the "Beyond the Book" project, which seeks to explore possible approaches to digital forms of the ePassport. At the same time, another project explores approaches to using mobile devices as digital passports. These projects will be reported back to the next NTWG meeting for consideration. The potential for the digital passport is immense. The LDS could be extracted from an ePassport as part of border control processes, check-in or visa application, and used to validate the traveler and facilitate their journey or application. This approach will help avoid issues with data quality or live facial image capture. The main advantage of using the LDS as the digital passport is that it is already defined by international standards and used by over 700 million ePassports around the world.

Another development being explored by ICAO is that of LDS 2 – an extension of the LDS that is able to store digital border stamps and electronic visa records. This idea is a long way from being adopted at this time.

For travelers who use their passport to store physical visa labels or border entry stamps, the digital passport will not be of any use. As stated, the digital passport will not, for the foreseeable future, replace physical passports; rather, it will supplement them. For travelers coming to Australia, where border stamps and physical visa labels are no longer used,



the digital passport offers the traveler convenience and facilitation, and reduces the chances of data errors slowing them down at check-in or border crossing.

One day, the concept developed by Mr. Lynch and Mr. Bennett may well become reality – the traveler choosing to release their digital passport to a cloud-based travel solution so as to facilitate every aspect of their journey. This is a strategic, clever and innovative vision. But in the interim, we are looking at new approaches to travel facilitation and security by the use of the digital passport at the Australian borders.

#### THE ORIGINS

The above clarification by the Australian Ministry of Foreign Affairs mentions the proposal by Michael Lynch and Alan Bennett, in which the authors note, that there is a direct link between passport and border technology. For countries that use automated border control systems, virtual passports could become a viable alternative to ePassports. Alternatives to the passport book are already with us, such as RFID passport cards

linked to a passport database and trusted traveller programmes for border crossings based on a single enrolment process into their database.

#### MOBILE AND VIRTUAL IDENTITY DOCUMENTS

Aside from traditional passport systems, there are two kinds of possible traveller identification systems: mobile and virtual identity documents.

Mobile IDs, where an identity credential is included as an element on an electronic token such as a smartphone, already exist, e.g. in some driving licenses in several countries. The idea, however, is not without problems, such as the need to accommodate different proprietary Operating Systems (OS) and their frequent updates, privacy issues, security issues and protection against hacking and identity theft, etc.

Virtual IDs, the authors claim, avoid many of these issues. In a virtual ID everything needed to identify a person is stored securely in a back-end system, accessible only to those entities that need to know, such as the airline and the border officials. As no physical document is present, there are fewer



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security risks, tampering and forgery would be more difficult and only authorized persons would receive the data.

The authors state that there is already a (conventional) model for a virtual passport border system: that between Australia and New Zealand. Both countries use the Smartgate border control system, which works with any eligible ICAO compliant ePassport and does not require pre-registration by the traveller. The system matches the portrait on the passport chip to the Smartgate facial recognition image. Online visas, as such issued by Australia, are also checked and authenticated by the system. The passport simply is the means by which the identity and security information is introduced into the inspection system. But, so the thinking goes, the data could also be delivered by other means.

In a virtual passport system, trusted data could be transferred in two ways to the inspection system, through a database or a data package. A database would be suitable for returning citizens, as it would be held in the home country, but destination countries would not have the databases of all countries travellers come from. An individual data package - a virtual passport - would solve this problem.

In many ways, the virtual passport would be similar to a conventional ePassport. The data needed at the border would be structured according to the Limited Data Set (LDS), which would allow the software to be adapted to read the LDS data from both a virtual and a traditional passport. Security for both kinds would be provided by Passive Authentication. The privacy and anticloning functions of Basic Access Control, PACE and Active Authentication would not be needed, as the virtual passport would be held in an encrypted container.

#### HOW WOULD A VIRTUAL PASSPORT WORK?

On creation of a virtual passport, a key and a key generation application would be sent to the traveller's smartphone and/or email account, to create a one-time key to authorise access to the virtual passport. This would allow the passport to be viewed by e.g. border officials and enable the owner to be identified. Providing the passport key once (e.g. at check-in) would also allow to perform all subsequent steps, including generation of advance passenger data, demanded by many countries, visa checks, et. Access to the virtual passport could be protected by the PKI system currently used for the ePassport, which would be extended to encrypt the whole LDS data package that is the virtual passport. The mobile application that generates the one time key gives the owner control over the access to his information. In addition, the keys would have a (short) time limit. As after

the initial check-in, facial recognition would be the only necessary method of identification for departure and arrival, the facial recognition technology is very efficient in 1:1 checks, as in smart gates, and in 1:few checks (less so in 1:n checks, comparing a face to millions).

#### WHY VIRTUAL PASSPORTS?

The main benefits of virtual passports, the authors think, would be security and facilitation. A virtual passport can't be lost, altered or forged, and the use by imposters could be more easily detected. Also, virtual passports would provide more and better advanced passenger data than before, enabling more advanced pre-screening of passengers that can also include biometric matching against watch lists. There would also be a potential to speed up the border crossing process, although, in the beginning, automated processes sometimes fail to deliver on this. However, without doubt, practice makes perfect.■

*The detailed article by Michael Lynch and Alan Bennett is available at:*

<https://www.keesingtechnologies.com/wp-content/uploads/2016/01/AR15-Lynch-Bennett.pdf>

## NEWS

### Gieseck & Devrient Currency Technology GmbH.

Under the new corporate structure of Giesecke & Devrient, effective January 1<sup>st</sup>, 2017, Dr. Wolfram Seidemann, in addition to his function as Chairman of the Management Board of Louisenthal, will become Chairman of the Management Board of G+D Currency Technology GmbH. The board of the company will consist of Dr. Wolfram Seidemann (CEO), Guido Koller (CFO), Bernd Kümmerle (Banknote Solutions), and Florian Reithmeier (Currency Management Solutions). Papierfabrik Louisenthal will be a fully owned subsidiary under Giesecke+Devrient Currency Technology GmbH.

### Venezuela to issue new bolivar notes

Venezuela will introduce six new notes and three new coins from mid-December to help alleviate practical problems in doing business with the world's most inflationary currency, according to the central bank. The largest of the new bills will be worth 20,000 bolivares, just under \$5 (£3.90) on the streets. It will be accompanied by notes of 10,000, 5,000, 2,000, 1,000 and 500 bolivares and three coins of smaller value.



## TRENDS IN ID FRAUD

With passports and ID cards becoming ever more secure, fraudsters are targeting softer targets.

Passports and ID documents have improved much in the recent past, but these improvements have not lead to less document fraud, said Fernando Alvarez, Head of the Document Fraud Department of the HQ for Aliens and Borders of the Spanish National Police at the Intergraf Conference in Seville. On the contrary, the introduction of more sophistication with an array of special substrates, inks and security features into ID documents have lead to a steady increase in document fraud, according to EU statistics. The existence of new, technically sophisticated and secure ID documents lead fraudsters and counterfeiters to seek new and "softer" targets. In the last 10 years conventional efforts to counterfeit or alter ID documents have shifted from counterfeiting ID documents from scratch or altering existing and usually stolen documents to attacking other weaker points in the ID document chain. The consequence for issuers and law enforcement agencies should be to strengthen the whole ID chain and look at identity management as a unit.

The ID chain consists of identity registration, document production, document issuance, document inspection and management of the end of

the document life. The document itself is the physical link between ID registration and the issuance process. In the past, it was thought that the document itself is the weakest link in the ID chain and documents, such as ID cards and passports must therefore be especially protected. Recent experience, however, showed that every link in the chain requires the same protection. An increasingly popular ploy of ID fraudsters is to attack breeder documents. Neither the issuance nor the form of issued breeder documents is standardized or harmonized internationally or even in the EU. There is a wide variety of issuance processes and myriads of different forms of, e. g. birth certificates, making them easy to counterfeit. In many countries, the documents are not backed up by national data-banks of births and deaths, and even if there are such databases they are often not shared between authorities within one country and even less so between countries.

Document inspection for passports and ID cards looks a little better. There are protocols for the verification processes of documents by different authorities, which aim to reliably link the holder to the document, which provide for a fair degree of interoperability. This means that document inspection is at least half harmonized.

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For the end of the validity of a document, authorities use protocols and processes to prevent their continued use. This, however, is another area that lacks international harmonisation and a large variety of practices for cancelling and destroying ID documents and of revoking chip certificates are used.

#### TECHNOLOGY AND REALITY

While in the not so distant past, the trained eye of the police or border official was the main defence against a genuine passport being used by someone else, there is now a large array of highly sophisticated biometric detection devices, among them facial recognition, iris scans, finger prints, etc. Impersonation, either by a person that looks like the genuine holder of the passport or the use of a "morphed" portrait photo to enable two persons to use the same passport, is one of the current concerns in the fight against passport and ID fraud. Statistics show that, between January 2015 and May 2016, in France in detected passport frauds, 56.9 per cent used either lookalike imposters or other imposter techniques. In Sweden the percentage was even higher, at 74.5 per cent. "The extent of this criminal phenomenon, however, is very difficult to estimate as most cases of document abuse by impostors may actually go undetected" Mr. Alvarez said. "Despite the wide use of latest technologies and biometric data chips in the currently issued passports, automatic checking of persons holding such documents may still be problematic as the equipment allowing automated comparison is not always available and is not always 100 per cent reliable.

Morphing is a photographic effect that changes the images of two persons into one image through the use of specialized - but relatively easily available - software. The aim of morphing is to produce a face image which is very similar to one of the two subjects (the applicant of the document) but that also includes facial features of the second subject. Of course this objective is easier to realize if the two subjects have similar faces, but this condition is not strictly necessary. Fraudsters can use morphed photos when the issuing process allows the applicant to supply passport photos. Live enrolment, in which the photograph is taken in the place where enrolment takes place, prevents the use of morphed photographs.

#### A VOICE FROM THE CENTRE OF EXPERTISE ON IDENTITY FRAUD AND DOCUMENTS (ECID)

Mr Alvaro's thoughts were echoed by Alexander Castanon Reglero of the Dutch Royal Netherlands Marechaussee. He said that although they still see many forged or counterfeit ID documents, the other great threat in Europe, where the level of security within the documents is very high, comes

from fraudulently obtained genuine documents, which leads back to the issuance process. In most countries, to obtain a passport or an ID card, a breeder document is necessary and these are not always well protected. The other threat the border agencies detect, is that of look-alike imposters, which is becoming a real issue, although it should not be overstated. But, he said, perhaps the imposters are so good that many are getting through. It is hard to say. The morphing issue is a big risk as well, but again it is difficult to assess the size of the risk. And again, it is something that refers back to issuing procedures.

Visual inspection alone may not be enough, so adding e.g. fingerprints to the identification process would reduce the risk of imposters or morphed photographs. However, Mr. Castanon Reglero said, although Passports in the EU Schengen zone contain fingerprints since 2009, they are still not used. From next year on, fingerprints will be part of the checking procedure between some European countries, but even before these are checked, the border agent must have some doubt about the identity of the person before him/her. Comparing fingerprints in the first inspection line will probably take around 40 to 45 seconds, which is too long to be used for all people crossing. But using it in the second line is certainly possible. However, fingerprint checks from passports will apply only to some European countries and not necessarily to countries most migrants come from.

Automatic detection, e.g. in eGates at airports already provides a high level of fraud detection, but even here, there are thresholds and the demands of security and convenience have to be carefully balanced. An additional point is that ID documents are not only checked at borders but at many situations within a country. The police, or whoever needs to check a document, will not have the possibility to check fingerprints, as they are meant for border crossings only.

#### WHAT TO EXPECT

Asked his opinion about the near to medium future, Mr. Castanon Reglero said that further digitalisation is inevitable. While ICAO is developing new structures such as the LDS2, which could be adopted relatively fast by industrialized countries, the rest of the world is traveling as well. The Machine Readable Zone (MRZ) was introduced in the early 80s but only in 2015 has ICAO set a deadline for all passports in circulation to contain a MRZ and there are still passports in circulation without it. The future may bring passports without visa pages, perhaps there will only be a passport card, but it will take time. Paperless documents that can be used worldwide will take even longer to come about. ■

*(There is an interesting academic paper on photo morphing available from the University of Bologna: The Magic Passport, by Matteo Ferrara, Annalisa Franco, Davide Maltoni at [www.researchgate.net](http://www.researchgate.net))*





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