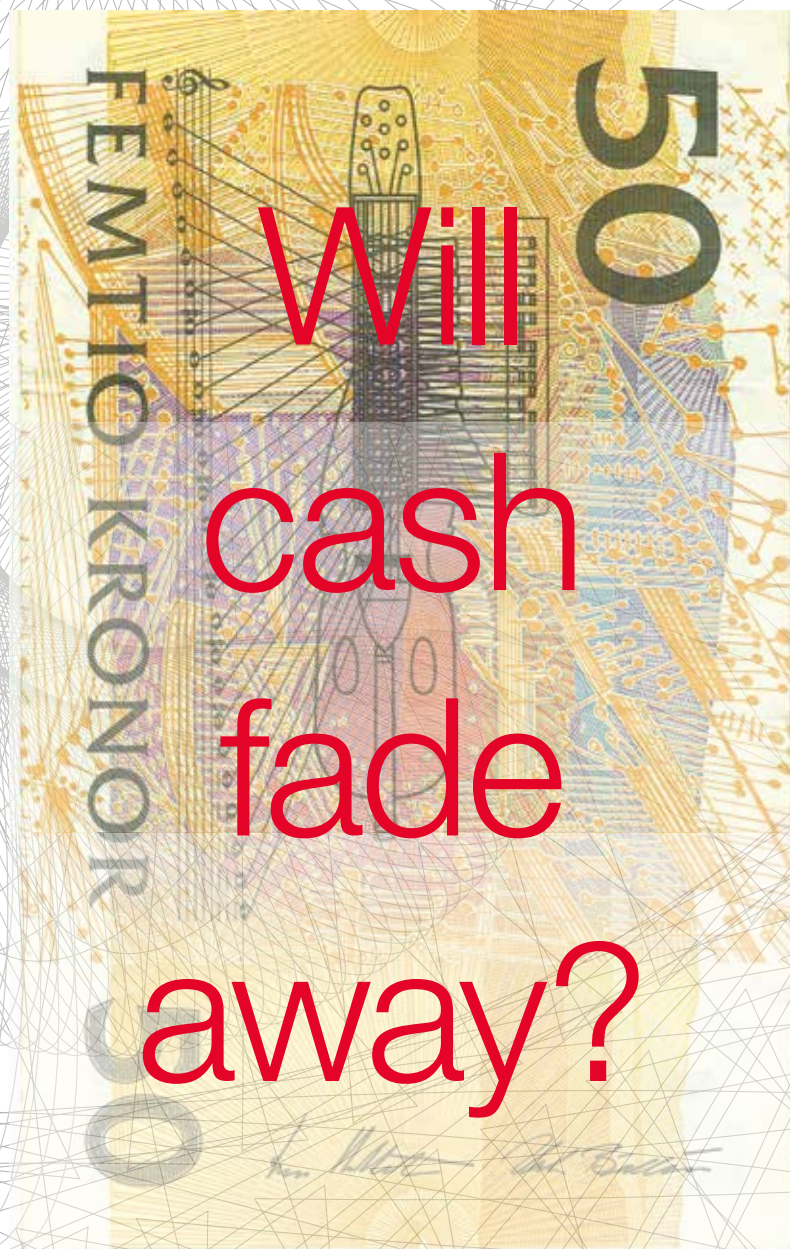


INFOSECURA



... and the new UK passport, emerging rules for
Emergency Travel Documents and new ID cards
for Nigeria

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Is cash fading away?



Several pages of this issue are devoted to the future of cash. With more and more alternative methods of payment appearing, central banks are beginning to think seriously about whether or for how long they should stick to tradition and continue to issue banknotes. In countries with a large "black economy", the anonymity of cash is a headache for tax authorities. They would probably prefer traceable electronic payment methods only, but it is not up to them to make such a change. However, there are important voices in central banking circles that argue for such radical measures. In September, Andy Haldane, the chief economist of the Bank of England proposed getting rid of cash altogether. The reason he advanced for such a move is that without cash, central banks could introduce negative interest rates, which is simply a charge on depositors, who keep their money in the bank - instead of investing or spending it. Negative equity is only practicable if there is no other way of storing money, as otherwise, people would quickly convert bank deposits into cash. As the number of high-denomination banknotes in circulation - or perhaps better, at rest - in the Euro area and also in the UK and other countries shows, many savers already prefer to hide bundles of cash under the mattress, rather than putting them in the bank.

All this points to the inability of financial policy makers to boost spending and thus stimulate the economy. Mr Haldane said that it may be necessary to cut interest rates from their present historic low of 0.5 per cent to support UK growth and return inflation to target. Mr Haldane thinks that the logic of negative interest rates implies that there may be a need for a government-backed electronic wallet. "This would preserve the social convention of a state-issued unit of account and medium of exchange, albeit with currency now held in digital rather than physical wallets." Such an electronic wallet would also make every financial transaction traceable and, short of becoming "honest", the money that is now swirling around the black economy would go to private virtual currencies, such as Bitcoin, where the money trail is totally untraceable.

Mr Haldane's thoughts also conflict with what the Bank of England's Chief Cashier, Victoria Cleland, said when she promised that notes and coins are here to stay. She seems to mean it, as she announced that three of the bank's four denominations would move to polymer, and thus last longer than paper notes.

Meanwhile central banks are continuing to investigate Bitcoin. The Bank of England published a paper in its Quarterly Journal, the European Central Bank in February published : "Virtual currency schemes - a further analysis" and Björn Segendorf and Cecilia Skinglsey of Sveriges Riksbank published papers on the subject, all on the possible influence of virtual currencies in economic behaviour. It is not Bitcoin itself but its underlying software that has caught the attention of government institutions worldwide. The Economist (30 nov. 2015) wrote that the cryptographic technology that underlies Bitcoin, called the "blockchain", has applications well beyond cash and currency. It offers a way for people who do not know or trust each other to create a record of who owns what that will compel the assent of everyone concerned. It is a way of making and preserving truths. The Bank of England agreed by stating in a research note last year that distributed ledgers, such as blockchains, are a "significant innovation" that could have "far-reaching implications" in the financial industry. We might be at the beginning of something important and we don't know if it will turn out to be a great benefit or a disaster for our industry.

Editor 

Copenhagen: on the record

 **850+**

participants from
central banks,
ministries, police
forces, security
printers and
suppliers

 **100+**

exhibiting companies

 **65**
countries

The general feeling among those involved in business, economics and politics in spring 2015 was one of nervousness. There were plenty of open questions troubling the European public; the Greek debt crisis, the future of the Euro, the beginning of the refugee crisis... Neither the year of 2014 nor the first months of 2015 could be described as quiet and comfortable - nor could be the months following the Security Printers 2015 event. However, the Copenhagen conference satisfied a need to seek contacts, advice and perhaps reassurance from colleagues and the experts that delivered the 67 presentations in the general and the high security conference. The remarkable fact about the Intergraf conference is that it addresses and connects both sides of the security printing world, as it brings together the whole industry, banknote printers as well as producers of ID documents and their respective clients from national central banks and the ministries in national

A voice to sum-up the conference:

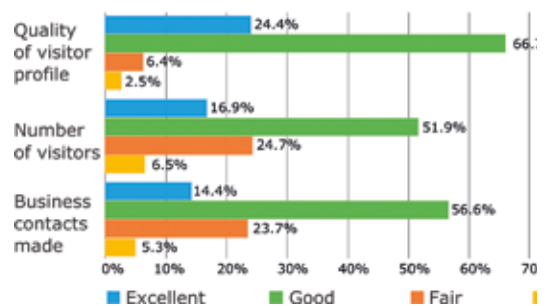
A great way of combining content with networking!. A necessary insight to make Public-Private Partnership possible. Wietse van der Schaaf, Dutch National Police

governments that are charged with issuing passports and other official ID documents. And of course the suppliers that support either or both areas. Many of the printers and suppliers are active in both spheres and this international and interdisciplinary conference is unique in providing great opportunities for cross fertilisation.

For the 850 participants and over 100 exhibiting companies from 65 countries, the Copenhagen

The preparations for the next Security Printers, International conference and exhibition in Seville, to be held on 5 to 7 October 2016, are well underway. It promises to be again a very successful and valuable occasion for both delegates and exhibitors. Before looking closer at what the next event has to offer, it may be apt to look at what the last conference, Security Printers 2015, delivered.

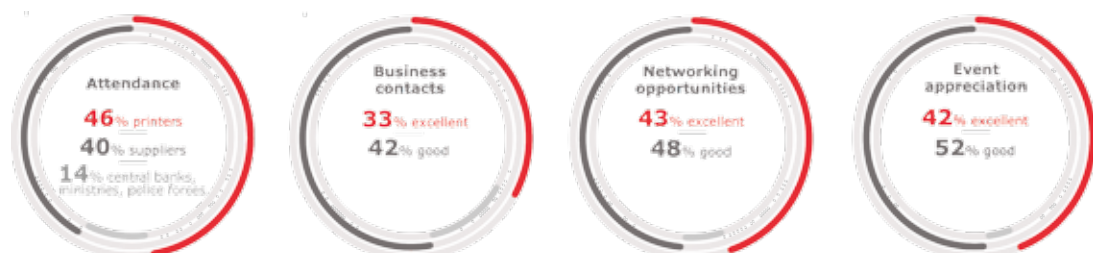
Return on investment for exhibitors



conference proved to be a very fruitful experience. It enabled security printers, which made up about 46% of the participants and their suppliers - around 40% - to meet their customers and they, the representatives of central banks, ministries and police forces, which accounted for 12%, were able to learn about new threats and how to counter them.

	Participants	% Total
Central Banks	42	4.98%
Ministries	32	3.79%
Law Enforcement	27	2.86%
Grand Total	101	11.98%

And finally, Security Printers 2015 was fun, with the synchronized drumming of the "Copenhagen Drum Band" at the "Welcome Cocktail" and the Dinner Party at the Circus Building at Wallman's, combining exquisite food with extraordinary performances by a troupe of talented circus artists. Exhibitors should now prepare for the next event in Sevilla, Spain. Over 80% of the exhibition space is already sold out.



A TALE OF TWO CURRENCIES

Two countries, two banknote strategies. While Poland experiments with technical innovations by issuing commemorative notes, Sweden opts for popular appeal by portraying cultural stars, still in recent memory, on its new banknote series.



Central banks in European Union countries outside the Euro zone have the privilege of being able to issue commemorative banknotes. These notes are often sold to collectors who pay a premium above the nominal value, but, more importantly, they also allow the issuing national bank to try out new designs and security features. The 20 Złoty note issued by Narodowy Bank Polski in August and commemorating the 600th anniversary of the birth of the medieval Polish historian Jan Długosz, is such a note. Its rather conventional and sober look belies the new technology hidden in the substrate. It is the first banknote printed on Laser Engravable Anti-Counterfeiting Paper, a development by the Polish Security Printing Works PWPW and also the first to have a two-dimensional QR code engraved by laser. 2D technology allows a user with the appropriate smartphone app to scan the QR code of the note and immediately receive information about the subject matter of the banknote and its security features at a dedicated website.

PWPW's Laser Engravable Anti-Counterfeiting Paper consists of special paper pulp and coating, that allows to laser-engrave a clear and legible picture without the need to laminate the paper onto any plastic film. Hitherto such laser engraving was only possible on polycarbonate substrates or polycarbonate and paper laminates. PWPW explains on its website, that "the composition of the paper allows leaving engraving marks on not only the paper surface, but also within the paper pulp itself. This creates an interesting effect of an amplified image observed as translucent, similar to a watermark effect. Engraving marks are tactile."

Apart from laser engraving, the banknote has a large number of other security features. There are further laser engraved features, such as the number and a watermark-like feature resembling a gothic window in Wawel Cathedral, which is the main intaglio feature on the reverse, as well as a real watermark, an OVI element, intaglio micro printing, a Latin text visible under UV light, and others.

CLOSE TO THE PEOPLE

Like many central banks, Sveriges Riksbank likes portraits on their money, mainly for reasons of security. For even greater security, in its newest series of Krona, the bank chose to depict people that are still remembered by a large number of Swedes and whose works will be enjoyed by generations to come. There is children's author Astrid Lindgren, film and theatre director Ingmar Bergmann, musician and author Evert Taube and UN General Secretary Dag Hammarskjöld. Film actress Greta Garbo and soprano Birgit Nilsson can still be enjoyed on CDs and videos, although the notes with their portraits, the 100 and the 500 Kronor, will only be issued in 2016. The six new denomination of the Swedish Krona, the 20, 50, 200 and 1000 of which came into circulation on October 1st, are aiming to be meaningful and close to the sentiments of the population. Every portrait on the front of the note is accompanied by the image of a particular landscape in Sweden that had great influence on the life of the person depicted. This is not an obvious history lesson for Swedes but an attempt to link the currency to the very recent memory of everyday people.

The notes themselves have the usual security features, the most prominent on the low denomination 20 and 50 Krona notes are an OVI, which on all notes refers to the person featured, e.g. a book for Astrid Lindgren, etc., while the higher denomination notes additionally have a three-window Motion stripe, with moving images that alternate between "KR" and a royal crown when the note is tilted. Compared to, say, the Euro, the value of the range is modest. The 20 Kronor note is worth very roughly €2 and the highest note, the 1000 Kronor only about €100. Swedish money hoarders will need quite a bit of space to stash their fortunes. ■





Electronic payment methods seem to gain in popularity, but every electronic transaction is not only traceable, it also costs money, often directly for the vendor and indirectly for the customer. Is there any chance that a virtual currency, such as Bitcoin, with which transfers are very fast and very cheap, could replace both cash and credit cards?

When we last talked about Bitcoin in early 2014 (Infosecura Issue 57), the virtual currency was seen as a rather shady affair used by drug dealers and money launders. Also, disconcertingly, its value went wildly up or down according to the publicity it received. All things that make a solid banker dizzy. Meanwhile many things have happened that changed the image of the virtual currency. During the Greek debt crisis, it was rumoured that the then Greek Minister of Finance, Jannis Varoufakis, had hatched a 'Plan B' in case of a Grexit, based on IOUs to be exchanged with Bitcoins. It never came anywhere near being official and it probably would not have worked anyway, but it made Bitcoin once again into a talking point.

New York Times (NYT) said that the UK based bank Barclays has a team working on about 20 experiments that explore how the technology underlying Bitcoin might change finance. The interest is understandable, as it potentially would allow people and banks to directly exchange money and assets like stocks and bonds without having to rely on a long chain of expensive middlemen. According to the NYT, executives from more than a dozen large banks confidentially discussed how the technology underlying Bitcoin could be used to change foreign currency trading, the largest financial market in the world. Even the US Federal Reserve and the Bank of England have their experts looking at the technology.

One of the main characteristics of Bitcoin and of other virtual currencies is that it cuts out the middleman - the banks - in transactions between two parties. Transferring money via Bitcoin is also almost instantaneous and very cheap. Banks could be expected to be furious, but surprisingly they - including central banks - take a lively interest in Bitcoin. However, their aim is not primarily to squash an irritating competitor, but to use the undoubted advantages the system offers for their own operations.

SAFETY IN NUMBERS

As there is in any digital record of currency the possibility to copy it and spend it more than once, the transaction has to be recorded and validated. In systems used today, e.g. in online purchases, transactions pass through a central authority, a credit card such as Visa or PayPal, that can move the money and update the records on both sides. In contrast, the Bitcoin network is run by a decentralized network of users who jointly keep track of transactions and update the records in real time, with no single user or company in charge. The records of all transactions are kept on a public ledger — essentially just a big, publicly available spreadsheet — known as the blockchain, that is visible to anyone and has, at least so far, proven impossible to tamper with. Rather than users having to trust special institutions, reliance is placed on the network and the rules established to reliably change the ledger.

Bitcoins are created not by digging gold from the ground, nor by some hypothetical public good, but “as a reward for payment processing work in which users offer their computing power to verify and record payments into a public ledger. This activity is called mining and the miners are rewarded with transaction fees and newly created Bitcoins” (Jerry Brito and Andrea Castillo (2013). “Bitcoin: A Primer for Policymakers” (PDF). Mercatus Center. George Mason University.) Besides mining, Bitcoins can be obtained in exchange for different currencies, products, and services and they can be sent and received for an optional transaction fee. As Bitcoin is not denominated in any national currency, it is a virtual currency, which can be used in any country, as well as a decentralized payments network.

The Bank of England describes the transfer sequence like this: “The basic process for cryptocurrencies is as follows. A user, wishing to make a payment, issues payment instructions which are disseminated across the network of other users. Standard cryptographic techniques make it possible for users to verify that the transaction is valid — that the would-be payer owns the currency in question. Special users in the network, known as ‘miners’, gather together blocks of transactions and compete to verify them. In return for this service, miners that successfully verify a block

The part of the system that interests banks is the underlying software. Wall Street devotes much money and considerable resources to the technology that was designed to circumvent it. The

of transactions receive both an allocation of newly created currency and any transaction fees offered voluntarily by parties to the transactions under question. When blocks of transactions are verified, they are added to the ledger (the 'block chain'). A key design goal of digital currencies is to balance incentives carefully in order to make it more profitable to participate in the network honestly than to try to get fraudulent transactions accepted. To this end, a cost is imposed on making changes to the ledger: more concretely, miners must devote computing resources to mathematical puzzles that are hard to solve, but the answers to which are easy to check. Those contributing greater computing power will, on average, solve the puzzle first and reap the reward. So long as no one miner, or pool of miners, attains a sustained majority of computing power, those transactions that have been verified will continue to be accepted as valid."

The banks are now trying to find out, if this blockchain technology can be used independently of Bitcoin. Financial companies such as the Nasdaq OMX Group think that it can and they even have software that is supposed to go live this year (or maybe next). The NYT writes that this new software will allow trade in shares in private companies, replacing the current system of issuing and trading paper certificates. Other banks, such as Barclays, are looking at ways to use the blockchain to speed up and lower the cost of consumer payments to compete with credit cards and direct money transfers. However, most of the development work seems not to be directed towards this end of the financial market, but towards new systems that big Wall Street traders and investors use to buy and sell sophisticated assets like syndicated loans and corporate bonds. If this is what is going to happen, the effect on issuing and circulation of physical currencies will be limited. But Central Banks are concerned with more than just cash.

A QUESTION FOR CENTRAL BANKS

In a discussion paper called "One Bank Research Agenda", the Bank of England asks: "Why might central banks issue digital currencies?" The question is not answered, as the paper only sets out subjects that should be researched, but the BoE recognizes that private digital currencies (such as Bitcoin) have shown that it is possible to transfer value securely without a trusted third party. The Bank also acknowledges that while existing private digital currencies have economic flaws, which make them volatile, the distributed ledger technology that their payment systems rely on may have considerable promise. Because of the mentioned volatility, the Bank does not seem to think that a virtual currency like Bitcoin could replace a national fiat currency.

However, the technology could be used as a new way of undertaking interbank settlement, or it could be made available to a wider range of banks and non-bank financial institutions (NBFIs). In principle, it might also be made available to non-financial firms and individuals generally, as banknotes are today. However, making central bank money widely available could have an impact on deposits held at commercial banks and a knock-on effect on the banking system. Another relevant issue is the impact that offering a new method of settlement in central bank money would have on existing payment systems. The BoE paper sets out a range of other questions to be examined, but the possibility of replacing familiar cash with a virtual currency is not on the horizon.

THE ECB'S TAKE ON VIRTUAL CURRENCIES

At a Chief Economists Workshop at the Bank of England, London, on 20 May 2015, Luc Laeven, Director-Genera, DG Research, explained the position of the European Central Bank with regard to virtual currency schemes. He said in the conclusion to his presentation that virtual currencies are not full forms of money, but alternatives to money that can substitute banknotes and coins, scriptural money, and e-money in certain payment situations. Risks that virtual currency schemes might create in relation to the ECB tasks in price stability, financial stability and the smooth operation of payment systems have remained insignificant: the ECB does not see a need to amend or expand the EU legal framework related to these ECB tasks. Participation in virtual currency schemes exposes users to a range of risks, including risks inherent to the concept, such as exchange rate risk related to high volatility, counterparty risk related to the anonymity of the payee, and investment fraud risk related to the lack of transparency. In the EU, these risks mostly remain unmitigated by legislation, regulation or supervision.

Much will depend on how fast and how far Bitcoin will spread. The BoE said that as of 9 July 2014, there were almost 41 million addresses listed on the Bitcoin blockchain, but only 1.6 million that contained a balance of more than 0.001 bitcoins (roughly £0.35). This figure will still overstate the number of users, as each user may possess any number of wallets and each wallet may hold any number of addresses. Geographically the most active bitcoin area is China. In a 30 day period to August 20, 2014, almost 60% of Bitcoin trading with traditional currencies was against the Chinese Renminbi, with 32% traded against the US dollar and 3% against the Euro. Only 1.2% of trading was against Sterling. Due to the Greek debt crisis, the numbers may have gone up slightly in Europe, but generally, Bitcoin growth seems to have slowed. ■

References: Apart from articles in the New York Times and the Wall Street Journal and a presentation at the BoE Chief Economist's Workshop, this article uses material from the following sources: "Bitcoin: A Primer for Policymakers" (PDF) by Jerry Brito and Andrea Castillo (2013). Mercatus Center, George Mason University; Bank of England: One Bank Research Agenda, Discussion Paper; Bank of England Quarterly Bulletin, 2014 Q3 - The Economics of Digital Currencies, and Innovations in payment technologies and the emergence of digital currencies.

WHAT ABOUT CASH? IS IT WELL, STILL ALIVE OR SLOWLY DYING?

Cash has become a worry. There are voices that demand its abolition as an inefficient anachronism but there are equally vociferous defenders of the humble banknote. Growth figures are clearly on the side of the defenders and a recent report by the Bank of England shows that cards and electronics do not hold sway over the whole money field. However, worrying about the ascendancy of electronic payments may turn out to be a red herring. Cash is increasingly used for other things than paying for goods or services.

There are moments, when suddenly, old certainties are being questioned. One of these moments was earlier this year when the Danish government announced that it was planning a law that would allow retail shops to refuse cash for payment for goods or services, implying that shops would be able to accept electronic or card payments only. It was only an announcement, not yet a law, but many in the security printing industry saw it as the writing on the wall that “the end of cash was nigh”.

STILL ROBUST GROWTH

Reports of the death of cash have been greatly exaggerated, to paraphrase Mark Twain, but the jitters are real. But is the fear justified? A look at how much cash is in circulation in different countries, where this money is held and how it is being used, sheds more light on the issue. First, what is the growth rate for notes in circulation (NIC) in the last decade? ‘The Economist’ reports that in China the value of cash in circulation grew fourfold between 2000 and 2014 and in South Korea the annual growth rate of NIC since 2009 has been 15%. In the Euro area, cash grew by 8.5%, in Australia by 6.0%, in the USA by 6.0%, in the UK by 5.6%, and in Canada by 4.7%, but in Sweden the growth rate was negative with -2.4%. (Figures by BoE). Even in jitters-generating Denmark, there were 163,8 million banknotes in circulation in 2013 (in a population of 5.6 million), falling to 163,3 million in 2014. A decrease of 0.32 percent is a fall, but not a precipitous one. However, as the total value of cash in Denmark between 2013 and 2014 increased slightly but the number of banknotes decreased, it can be assumed that more high denomination banknotes came into circulation than before. The Dansk National Bank does not publish figures for the numbers of the different denominations in circulation, which would allow speculations about how the money is used. But as the value of the highest denomination, the Dkk 1000, is only about € 134, on can assume that if the Danes are hoarding cash under the mattress, it will be in Dkk 1000 notes.

In contrast, an article* in the latest issue of the Bank

of England Quarterly Bulletin (Q3) gives such details and reveals some surprises. The article states that according to available evidence, not more than half of the number of notes in circulation is likely to be held within the domestic economy, either for transactions or as a store of value. The remainder is likely to be held either abroad or for use in the shadow economy, primarily as a store of value in both cases. The domestic transactional cycle probably accounted for between 21% and 27% of total UK cash at any one time in 2014. In detail, the estimated stock of UK cash in the domestic transactional cycle is: financial institutions £10 billion, consumers £3 billion to £4 billion, retailers £2 billion to £5 billion, total £15 billion to £19 billion.

WHAT ARE BANKNOTES USED FOR?

These indicative findings raise the question: if the majority of Bank of England notes are not being used for everyday transactions in the domestic economy, what are they being used for?

For ad-hoc purchases, small denominations are preferred, but since the mid-1990s, the growth in banknotes has been concentrated in the two highest denominations - £20 and £50 notes. The same trend can be seen in other countries. This points to a substantial portion of cash in circulation as being hoarded (hidden somewhere in the home but not placed in a bank account). In 2014, a survey commissioned by the BoE about consumer behaviour in relation to cash usage and hoarding found that approximately 18% of people hoarded cash, and those that did suggested, the primary reason was to provide comfort against potential emergencies. The BoE thinks that a minimum of £3 billion was hoarded domestically — around £345 per hoarder. In 2012, a separate survey commissioned by the Financial Services Compensation Scheme (FSCS) estimated that households were holding around £5 billion in cash at home. Some of the hoarding can also be explained by the near zero interest paid on bank deposits. If the interest rate would go to minus, more hoarding would occur, if it would rise substantially, hoarding would decrease. Indeed, with cash around, negative interest rates would not work. This is why the chief economist of the BoE proposed eliminating cash, according to The Economist. (Presumably he would face stiff opposition from his colleague Victoria Cleland, who made a strong case for banknotes, especially polymer ones.)

Much of the cash of an important trading country such as the UK will be lodged abroad, for travel purposes or, in countries with unreliable monetary systems, as a store of value. This is probably in contrast to countries such as Denmark and Sweden, where most of the cash is bound to

* “How has cash usage evolved in recent decades? What might drive demand in the future?” Tom Fish and Roy Whymark of the Bank’s Notes Directorate, Bank of England Quarterly Bulletin (Q3)

be held in the country. The BoE suspects that the highest UK denomination (the £50 note - which makes up 20% of BoE notes in circulation, by value), is primarily demanded by foreign exchange wholesalers abroad, which suggests overseas hoarding.

Another section which absorbs a large proportion of cash is the shadow economy, which avoids "government regulation, taxation, or observation", commonly known as 'black money' and includes criminal activities. In the UK, the size of the shadow economy was estimated at 10.3% of GDP in 2012, one of the lowest of all OECD countries.

THE FUTURE DEMAND FOR CASH

This is where the banknotes are, but what influences the demand for cash in the future? Cash has continued to grow in recent decades, both as a medium of exchange and - more surprisingly - as a store of value. However, there is no guarantee that it will continue to do so, domestically, abroad, or within the shadow economy. There are six broad variables that influence the growth of cash: alternative ways to pay; alternative currencies; retailer and bank preferences; government intervention; socio-economic developments; and the public's attitude to cash.

There are parts of the economy, where cash has quietly and almost completely disappeared. Most regular payments, such as rent and mortgage payments, electricity and telephone bills, etc. are now handled by standing order. This represents a sizable amount but it is hardly ever thought of as a loss to cash.

ALTERNATIVE PAYMENT METHODS

Alternative ways to pay, via credit or debit cards or now via smart phones, are often thought of as the main reason for a reduction in the use of cash. This area is very innovative and alternative payment methods are expected to increase with contactless technologies becoming very important. The number of users and - most importantly - of vendors accepting the technology is rising strongly. There are also alternatives that make person-to-person payments easy, such as PayM that links users' mobile phone numbers to their bank accounts, and enables payments via text message.

Alternative currencies, such as Bitcoin (see article on page 6) are another much talked about threat to cash. Although the underlying software is of interest - not least for banks - the number of transactions in this technology remains tiny. The main attractions of digital currencies are their anonymity (or pseudonymity) and the speed and the low cost of transactions. At the moment it looks as if digital currencies do not pose a great threat to cash.

Of greater influence is the preference of retailers and commercial banks. A large proportion of cash enters the cycle via commercial banks and the preferred way for the public to access it is through the bank's ATMs. In the UK there are 70 000 of them, of which 50 000 are free to use. In developing countries the spread of ATM is more uneven. An ATM necessitates a bank account, which is almost universal in Europe but not yet in developing countries. An increase in the numbers of bank accounts and ATMs would probably have an effect on the use of cash.

Any change in cash distribution, such as a reduction in the number of ATMs or the introduction of charges for withdrawals would have a negative effect on cash use. A move to cashless bank branches, such as exist already in Sweden and Denmark, which make it more difficult for retailers to bank the day's takings, would probably influence them to phase out taking cash. It is unlikely that retailers are very keen to abandon cash, as e.g. in the UK, according to the British Retail Consortium's 2014 payments survey, the cost for a retailer of accepting cash is eight times cheaper than a debit card transaction, and over 30 times cheaper than a credit card transaction.

Government decisions to pay out welfare benefits, etc. only via bank accounts would force many more people to be 'banked'. On the one hand, they would thus get a credit or debit card, and open up further opportunities for cashless transactions, but on the other hand, they would gain the convenience of using ATMs. The net effect on cash use is difficult to judge and it probably would be different in each country.

A QUESTION OF PUBLIC ATTITUDE

In the end, the future of cash will depend largely on the attitude of the public. We can be certain that in coming years, non-cash means of payment will become cheaper, easier to use and more widely accepted. But the public still likes and demands cash, because, according to a BoE commissioned survey in 2014, it is fast and convenient, universally accepted, and helpful for budget management. Using cash for transactions also provides immediate final settlement at no visible cost to the consumer, and with no reliance on technology and central infrastructure.

Banknotes also have an emotional value as they represent 'the state' or 'Europe' in the Euro area. And these positive feelings are there even without sudden jolts such as the temporary closure of banks, as in Greece, or any catastrophic shutdown of electricity, that would also close card terminals and any electronic transfer. ■

Adding volume to holograms



To add to their range of foil features and to offer an alternative to surface relief holograms with their typical metallic look and rainbow colours in the image, the German based supplier of security features KURZ, developed **KINEGRAM VOLUME**, which uses different and distinct technologies to achieve vibrantly coloured images with visible movements which appear and disappear when the note is tilted.

Secure optically variable devices or OVDs by KURZ date back to 1983 when the then still independent KURZ subsidiary OVD Kinegram in Switzerland developed the Kinegram technology. In 1988 the first banknote issued that carried a KINEGRAM* was the 5000 Austrian Schilling note. In the 1990s, KURZ foils appeared on banknotes in Finland, France, Switzerland, and Germany. Until this day, the banknotes of over 80 countries used or are using security foils by KURZ in some or all of their denominations.

KURZ has been in the forefront of many developments in foil-based OVDs. The continuous KINEGRAM stripes with repeating images along the length of the stripe on the first issue of the Euro in 2001 have been replaced by a registered KINEGRAM stripe in the current "Europa" series with larger elements and a greater range of optical effects. Registration ensures that the diffractive images appear in the same position on all banknotes produced.

When windows first appeared in banknote substrates, both polymer and paper, KURZ responded with foil devices that were a transmission as well as a reflection feature. KINEGRAM REVIEW technology offers different effects in a window when seen from the front, the back, and in transmission, which hugely raises the bars for counterfeiters. A further milestone development has been the perfect registration of the optical with the metal content of the foil in the KINEGRAM ZERO.ZERO technology, a unique achievement by KURZ that enables complete design integration and maximizing optical effects.

THE KINEGRAM VOLUME

Surface relief holograms (i.e. embossed or cast) with their typical metallic look and rainbow colours in the image are still the predominant overt banknote security feature. And until now their big advantages over volume holograms have been cost, mass production capabilities and – critical on banknotes – thinness.

To extend the range of security features on banknotes, the Kurz Group adapted the alternative volume hologram technology for use on currency by creating KINEGRAM VOLUME, a technically highly complex member of the KINEGRAM family. Based on the proprietary KINEGRAM origination process, every single KINEGRAM VOLUME element is created by laser information written into a photosensitive layer, resulting in vibrantly colored images. As an element of surprise, visibility is only given at pre-defined viewing angles, creating an "on-off-effect" for the spectator. KINEGRAM VOLUME can be produced in large quantities and the feature has already entered the market on the new Israeli 50 Shekel banknote.

At first KINEGRAM VOLUME was available in single colours or in combination with a demetallized KINEGRAM structure. KURZ's latest developments for this feature, unveiled in May 2015, include the possibility for registered images or designs, the use of a wider palette of clearly visible movements and effects and the superimposition of two colours in one foil stripe, with a permanently visible 3D background pattern and a distinct image in a front plane, visible in the typical "on-off" manner of classic KINEGRAM VOLUME.

This article was contributed by Kurz Group.



The KINEGRAM VOLUME Anatomy series (left) and the KINEGRAM VOLUME Traffic series (left hand page)

A CHALLENGING DEVELOPMENT

Kurz announced the KINEGRAM VOLUME feature in 2009, in the course of a project with the Swiss National Bank (SNB). The SNB wanted a durable volume hologram that was compatible with other foil technologies and other banknote features (eg. intaglio print) and thin enough to be used on banknotes. The feature also had to be able to be applied with existing banknote production equipment and had to be available in various colours and at a reasonable price.

It was a challenge for Kurz, as at the time there were no suitable holographic photopolymers available, nor any production facilities capable of producing volume holograms in banknote quantities of hundreds of millions. It took the company three years to reach the necessary industrial level. In May 2013, Kurz presented the KINEGRAM VOLUME 'Anatomy' series which featured bright images in red and green, movement, depth, rotation and pumping effects as well as shadows and transparency.



The first banknote with a transparent KINEGRAM VOLUME stripe, the new 50 Shekel banknote of the Bank of Israel and (right hand column) the first KINEGRAM VOLUME sample note of 2009.

The first currency issue to use a transparent KINEGRAM VOLUME stripe was the new 50 Shekel banknote of the Bank of Israel, which entered circulation on September 16th, 2014. It shows images of the note's denomination and the Israeli state symbol, the menorah, which appears when the note is tilted or rotated. KINEGRAM VOLUME foil stripes will also be used on the remaining three denominations, which will gradually enter into circulation.

*KINEGRAM, KINEGRAM REVIEW and KINEGRAM VOLUME are registered trademarks of OVD Kinegram AG.

INTUITIVE AUTHENTICATION

The deep colors combined with KINEGRAM movement and a remarkably strong on-off effect provide an exceptionally high level of counterfeit resilience, acknowledged in an independent survey by the well-known counterfeiting expert Leif Yde, the former head of the Counterfeit Resilience Research Centre (RRC) at the printing works of the National Bank of Denmark. He concluded that "KINEGRAM VOLUME [...] could not be deceptively counterfeited by any combination of available pigments, foils and printing."

The images achievable in a KINEGRAM VOLUME are fundamentally different from metallized foil OVDs, which is due to entirely different physical principles and materials used. Designs should be rather bold, simple and straightforward, in order for the end-user to intuitively understand and authenticate the features. As there are virtually endless design options, the feature can be totally integrated into the bank note design. To extend the design possibilities even further, KINEGRAM VOLUME can be combined with classic demetallized KINEGRAM structures. A new banknote series using this technology combination is currently being developed.

KURZ currently offers a choice of two colours – red or green – or the combination of the two, e.g. by superimposition or by running parallel to each other in the vertical plane. Further colours are under development and the portfolio will almost certainly be expanded, with more colours and new effects. It is also possible to include covert and forensic security features in a KINEGRAM VOLUME foil stripe, e.g. nanotext or other 2nd or 3rd level features. After being presented as a lamination type foil in its earliest forms, KINEGRAM VOLUME has now been redeveloped as a hot stamping foil in stripe format, but KURZ is also considering a solution for patches.

KINEGRAM VOLUME foil stripes can be freely overprinted with offset, intaglio, screen printing or varnished in flexo printing with a top coating/ varnish. In terms of durability, the foil stripes are comparable to "conventional" banknote foil stripes, i.e. they fully comply with the current standards commonly used for physical and chemical tests for banknote foils by major central banks and their printers. ■





THE BANK OF ENGLAND'S THREE-QUARTER SWITCH TO POLYMER

At a conference held at the beginning of September, the Bank of England Chief Cashier Victoria Cleland announced in her keynote speech that the next £20 banknote will be printed on polymer. This follows the announcement in December 2013 that the next £5 and £10 banknotes would also be printed on polymer. The bank said at the time that it had conducted a 10 week public consultation that found 87% of respondents were in favour of the change. The polymer £5 note featuring Winston Churchill will be issued in autumn 2016 and the £10 polymer note featuring Jane Austen one year later. The new £20 note, which will feature a visual artist nominated during the public nominations period held earlier this year, will enter circulation in 3-5 years' time.

The Bank said it made the decision to move to polymer for the £20 note following research into the developments in security features for notes printed on cotton-based paper and polymer since the 2013

decision was made. A competitive tender process for the supply of the polymer for the £20 note is expected to start in late 2015.

There are now two large suppliers of polymer for banknotes, Innovia Security and De La Rue. Innovia Security won the contract to supply its substrate Guardian for the new £5 and £10 notes and has factories in Australia, Mexico and in Wigton, Cumbria in the North of England. De La Rue, also with a base in the North of England, is to print the two new denominations. The company, which lost the last tender round to Innovia Security, will now be again in the running to supply its polymer substrate Safeguard to the BoE. De La Rue points out that it is the only supplier to offer full vertical integration of polymer design, substrate and printing expertise.

The decision of the bank leaves only the £50 on paper and it remains to be seen if this note will remain the last outpost of banknote paper for the Bank of England. It has been said that polymer makes most sense for high circulation, low value notes and less sense for high denominations more likely to be hoarded. But considering the British climate and the habit of many hoarders to bury their cash in the garden, polymer may have unexpected benefits for the British public. ■

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The Bank of England's enthusiastic embrace of polymer banknote substrates may have received the backing of the general public, but they are not the ones to pay for the true cost of changing from paper to polymer, argues an article in the UK payment industry's magazine «Payment Intelligence».

Intergraf's Infosecura is completely neutral about the question of paper versus polymer or which banknote substrate central banks should choose when deciding to issue a new series. As either substrate is printed by security printers, only the vigorous defense of both against moves to replace cash entirely falls within our remit. Paper has been the default medium for banknotes for a very long time and until the first Australian dollar note on polymer came along, nobody thought much about the advantages or disadvantages of paper. There was simply no choice. Now there is. Not only Guardian, the polymer market leader by Innovia Security and Safeguard by De La Rue on the pure polymer side, but there are also paper/polymer/paper and polymer/paper/polymer combinations, - Durasafe by Landqart and Hybrid by Louisenthal respectively.

Both combination substrates offer longer life in circulation and both can carry the full array of security features usable on paper, including watermarks, which are necessarily absent on pure polymer. Even traditional cotton banknote paper has improved vastly since polymer heated up the competition. There are pre- and post-print coatings to reduce soiling and various means of strengthening the corners and edges of paper notes. Add to that the range of new and highly sophisticated security features that have appeared since the coming of polymer, including windows, and in terms of functionality and counterfeit resistance there does not seem to be much distance between advanced paper notes and polymer notes. It seems to come down to public perception and cost. And it is the latter that has caused some criticism.

NOT JUST THE BENEFITS

The magazine "Payments Intelligence", published by CMSpi, in its Q3 2015 edition posed the question "who pays for polymer?". This follows the 2013 announcement by the Bank of England to issue the £5 and £10 notes in polymer and BoE Chief Cashier Victoria Cleland's remark in September this year

that the £20 note would also be issued in polymer. The BoE said that it will save £100 million over the next ten years by moving to polymer but CMSpi estimates the true costs of polymer banknotes to be in the region of £230m to £240m, far in excess of the Bank of England's saving forecasts.

The BoE had conducted a 10 week public consultation process, which included visits to UK shopping centres, media interviews, presentations and Q&A sessions. The bank said that it found 87 percent of respondents in favour of polymer notes. Since the end of consultation the general consensus amongst ordinary shoppers and merchants seems to be that the impact of the changes will be minimal, the latter being on average only 'slightly' concerned about the polymer introduction, according to CMSpi's Annual Payments Survey. Only the more informed cash industry voiced some concerns but over all, not one single respondent was able to guess the cost of the change to polymer to the economy.

CMSPI'S COMPLAINT

Payments Intelligence thinks the question of the true cost has been overlooked not only by the merchants, but especially by the BoE. The magazine accuses the bank that the decision making process was fundamentally flawed as it focused on the benefits of polymer 'rather than conducting an adequate cost-benefit analysis on the impact, the decision will have on the entire UK economy'. Because the BoE's public consultation process highlighted polymer's strengths, it was inevitable the process would return generally positive feedback, Payment Intelligence argues. The process also seems to have given the opinions of ordinary consumers the same weight as those of cash industry experts. The magazine expects there to be huge operational challenges for all merchants, particularly those who operate ATMs and vending machines. The co-circulation period, where both polymer and paper notes are present, could lead to retailers not receiving adequate amounts of polymer notes from customers in order to fill their newly-upgraded ATMs.

Payments Intelligence estimates that ATM replacement and recalibration will cost banks, retailers and ATM deployers about £ 45m, vending machine recalibration will cost £ 55m and cash circulation costs will set retailers back £ 60m, to list just a few. For outsiders it is difficult to judge how accurate or realistic these figures are and they will without doubt be questioned, but in any case they illustrate that such a radical change from paper to polymer banknotes carries risks.

The full breakdown of expected costs of the change-over can be found at www.cmspaymentsintelligence.com/eu/.../payments-intelligence-polymer. ■

New UK passport celebrates creativity

Every five years, the UK Passport Office presents a new passport design. The new book, unveiled on November 3rd, celebrates 500 years of creativity in the United Kingdom and features well known images of artists, landmarks, architecture and iconic British innovations and performing arts.

(right) a visa page spread of the new UK passport

Continental Europeans often think that understatement is still a major characteristic of many things British. While not completely out-dated, such views no longer hold true in many areas, not least among UK passports. Already in October 2010, Britain left behind an era of dull officialdom by introducing a passport that celebrated in pictures things that the British love to proclaim as their heritage; the white cliffs of Dover, thatched cottages, canal barges, etc. And of course the weather. Only five years after this breakthrough, the British Passport Office announced a new issue. While the 2010 UK passport was an affirmation of the genteel life of the British Isles, the new 'Creative United Kingdom' passport, that was presented to the public on November 3rd, is an unashamedly bold assertion of Britain's creativity, or even genius.

The images on its visa pages depict some of the UK's successes in innovation, architecture, art and performance that Britain can be proud of. There is of course Stephenson's Rocket, the London Underground, the architect of the - neo-gothic - Houses of Parliament and John Constable, the painter celebrating English landscape. And of course there is a portrait of Shakespeare every-

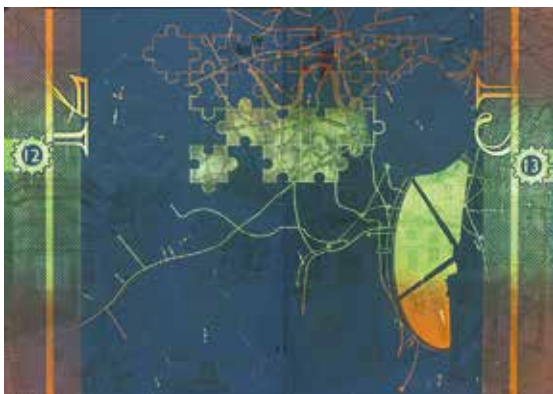
where, because as a watermark he peeks through on every page. But contemporary art also gets a look-in with Anthony Gormley and Anish Kapoor as does an early woman mathematician, Ada Lovelace and the architect Elizabeth Scott. Predictably, having two women

and seven men honoured on the visa pages, led to protests by equality activists and allegations of sexism.

In the brochure, with which the UK Passport Office is trying to familiarize Britons with their new passport, it is claimed that the 34 page book features the most intricate designs that have ever been produced for a UK passport. It describes the data page as being a laminated continuous sheet of paper that is adjoined to the back cover, which is apparently a 'first' in passport construction. The document also holds an electronic chip with an image of the holder. Apart from the main passport picture, a further portrait of the holder is on page 3. It is composed of letters and numbers that make up the holder's surname and date of birth. Under the heading of security printing, the brochure points to the perfect alignment of UV and visible ink printing, as well as the use of optically variable inks, IR and UV inks, intaglio printing and Gemini, a feature developed by De La Rue that fluorescents under UV light in two colours, but in daylight is only visible in a single colour. De La Rue also prints and manufactures the new passport.

The new passport makes liberal use of watermarks. There is the portrait of William Shakespeare on every page, alongside a writer's quill and the page number as electrotype watermark. The data page has a watermark of the sailing boat "Gypsy Moth IV" as well as the floral motifs of the four countries that make up the UK, England, Scotland, Wales and Northern Ireland. Apart from the printed passport number on the data sheet, the number is perforated into every visa page. UV security fibres, UV reflective sewing thread and a hologram covering the data page complete the visible security features. A second article in the next issue of Infosecura will give further details of the new UK passport. ■

A visa page spread viewed under UV light

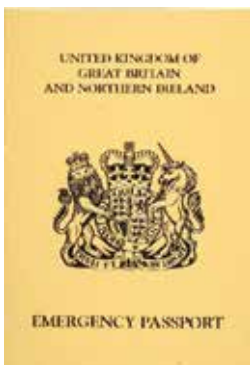


Emerging Guidelines for Emergency Travel Documents

Better security features and the electronic chip have made MRTDs and especially ePassports much more difficult to counterfeit. Now Emergency Travel Documents (ETDs) have become one of the weakest points in travel document systems for fraudsters to exploit.

Author: Claudia Schwendimann, CEO of OeSD International and Member of Intergraf's Committee of Experts and the ICAO MRTD working group.

There is great variety in formats and materials in ETDs.



Emergency Travel Documents (ETDs) are issued under time pressure, in times of mass evacuations, disasters and natural catastrophes and the circumstances for proving the applicant's identity and issuing a highly secure document to him/her are less than ideal. Consequently, these travel documents become the weak point of an otherwise secure identity management system.

Additionally, ETDs are exempt from the mandatory November 24th, 2015 deadline, after which all passports must be machine readable, and hence become an even easier target for counterfeiters.

WHAT IS AN ETD?

An Emergency Travel Document is issued by many states in cases where people need to travel urgently and time does not allow waiting for the issuance of an ordinary passport. Such situations can arise when the person is in his home country, and the death or serious illness of a relative living abroad requires immediate travel, or the traveller forgot his passport when already at the airport. Or when the traveller is already abroad and has no passport due to disaster (natural catastrophe, accident, turmoil,...), being victim of a robbery, has lost the passport or is to be deported, removed or repatriated.

Typically, ETDs are issued when at home, at the passport authority, or in some countries at the airport. In foreign countries, ETDs are issued from the embassy or consulate, at foreign airports or from mobile issuing stations in case of disaster with a larger number of affected citizens.

The terminus "Emergency Passport" is widely used, but a large number of synonyms are used as well, such as Temporary Passport, Provisional Passport, Temporary Travel Document, Emergency Travel Document for a Single Journey, Emergency (Travel) Certificate, Provisional Travel Document and there might be others as well.

An ETD always has a shorter validity period than an ordinary passport. But these can differ substantially according to national legislation and situation.

- One journey, one defined flight
- One journey within limited time (eg. 3 months)
- Multiple journeys within limited time (eg. 6 months)
- 7 – 12 months for any travel

WHAT AN ETD IS NOT:

In order not to confuse with other terminology, an ETD is not simply a normal passport with shorter validity period. It must not be issued/used, when an ordinary passport can also be issued (theoretically), it must not be issued to non-citizens and it is not to be used as a refugee passport.

WHY DO ETDs NEED GUIDANCE?

Countries that issue ETDs, report an increase in quantities over the past years. The reasons are the increase in complexity of issuing ePassports that made waiting times for ordinary passports longer. Mostly, personalisation of passports is no longer done at the embassies or consulates, but is repatriated to the home country in a central personalisation centre. So waiting time increased by at least the postal delivery time.



The German emergency passport is just called "Reisepass" without any mention of "emergency". It is valid for a year for all countries but instead of the usual burgundy, the cover is green.



Additionally, due to the shorter validity period of ETDs and the typically thinner booklets, ETDs are often substantially cheaper than ordinary passports. This is another incentive for the traveller to request an ETD (making up an emergency situation) rather than an ordinary passport. Consequently, more documents are being issued through the weakest link of the security chain, whereas at the same time highly secure ePassports are available. Fraudsters always seek out the weakest link in a security system and try to exploit that. ETDs are easier to counterfeit than normal ePassports and are a thus threat – the urgent need for guidance is obvious!

Currently, Annex 9 of the Chicago Convention does not provide guidance on ETDs, nor does Document 9303. The newly released 7th edition of Document 9303 reserved part 8 for future use and ICAO plans to use it for recommendations for ETDs.

The otherwise mandatory requirement for machine readability does not apply to ETDs, so they can still be issued by hand writing. Countries tend to use a balanced set of security features and techniques, as no security feature is 100% effective in eliminating all categories of threat, or no threat can be countered by just one security feature.

As an eye-catcher, many countries apply a distinctive look to the booklet, such as a pink or white cover, in order to draw the attention of border officers to the traveller, to whom the document was issued in abnormal circumstances. For not genuinely urgent use, the fact of more thorough

investigations at border crossing should annoy the traveller and consequently make him/her apply for an ordinary passport and refrain from the use of an emergency passport, when not really required. Additionally, fraudsters will not be happy to undergo second inspections.

Variety: These vague practises and the absence of guidance material lead to a great variety of documents. From A4 or A5 sized single sheets, to leporello-folded leaflets to passport books with varying number of pages, we find everything up to Emergency ePassports. One country might even have different ETD-formats at disposal, depending on the type of emergency.

WHAT THE EU SPECIFIES

The Council regulation 96/409 of June 1996 was published to establish an emergency travel document. The creation of a common format ETD for issue by Member States to citizens of the Union applies in those places where the citizen's Member State of origin has no permanent diplomatic or consular representation. The document serves a bit as a marketing tool, as it it provides a clear demonstration of the practical benefits of being a citizen of the Union. The establishment of a common ETD is likely to provide genuine help to the citizens of the Union in distress.

EU ETDs may be issued when all the following conditions are met:

- (a) the recipient must be a national of a Member State whose passport or travel document has been lost, stolen or destroyed or is temporarily unavailable, and
- (b) he/she is in the territory of a country where the person's Member State of origin has no accessible diplomatic or consular representation with the capacity to issue a travel document or, where that State is not otherwise represented, and
- (c) clearance from the authorities of the person's Member State of origin has been obtained.

Different to other examples, the EU ETD is to be issued by EU countries for the purpose of a single journey back to the applicant's EU country and is not valid for multiple journeys. The validity period of an ETD is slightly longer than the minimum time needed to complete the journey for which it was issued, which could be 3 to 5 days only.

ICAO and its working groups have started the work on guidance material and only very recently, a first draft was circulated, which is currently been commented by the experts. ■



NIGERIA'S NEW ID CARD - BASED ON ICAO STANDARDS

To prove one's identity is a precondition for participating in the services, today's digital world offers. Many Nigerians cannot prove their identity, which results in massive identity fraud. With a new identification scheme that provides a robust process for issuing a unique identifier before subsequently issuing an eID card, the Nigerian government is making great strides in combatting identity fraud; in enabling citizens to affirm their identity; and in allowing for citizens to genuinely earn access to the additional services the card will provide them.

The authors: Markus Hartmann and Barr. Chris 'E. Onyemenam

Markus Hartmann is a consultant, advising on eID projects and Managing Director of HJP Consulting. He is a member of the ICAO Implementation and Capacity Building Working Group since 2008. Barr. Chris 'E. Onyemenam is CEO of the Nigerian National Identity Management Commission (NIMC).

MANY NIGERIANS LACK PROVEN IDENTITY

Nigeria has a poor reputation when it comes to fraud. Nigeria's banks have lost millions of dollars to fraud, and it is not just foreigners who have been targeted. Nigeria's Inter-Bank Settlements Systems estimate that banks in the country lost 159 billion naira (USD 800 million) to electronic fraud between 2000 and 2013. 70% of adult Nigerians do not have a formal bank account, largely because about 130 million adult Nigerian citizens do not hold a genuine identity document.

Faced with its negative international reputation, local banking losses, proliferation of data capture, and the absence of a foundation identity programme, the Nigerian government tries to address the issue centrally. The National Identity Management Commission (NIMC) was established by the NIMC Act No. 23 of 2007. Last year, the National Electronic Identity (eID) Card was launched in collaboration with MasterCard.

THE NATIONAL IDENTITY MANAGEMENT SYSTEM (NIMS)

NIMC has the mandate to establish, own, operate, maintain and manage the National Identity Database in Nigeria; to register persons covered by the act; to assign a Unique National Identification Number (NIN); to issue General Multi-Purpose Cards (GMPC) to those registered and to harmonize and integrate existing identification databases in Nigeria. It is also to provide identity verification services. This will tackle the problem from the root cause by enrolling all citizens with their biographic and biometric data. A full portrait, 10-fingerprints and a digital signature are taken during enrolment. Only after passing a verification process, including breeder document and background checks of other databases, with a de-duplication search of the biometric features, will a unique NIN be granted.

With the NIN, the citizen (aged 16 and older) is then eligible to receive the new Nigerian eID Card which is made of polycarbonate with several security features. Personalization is done by laser engraving. The card contains a contact-based chip which contains some parts of the personal data taken during enrolment. The multi-purpose card currently incorporates five different applications such as:

- Match-on-Card - compares presented

- fingerprints against those stored in the chip
- ICAO Travel - machine readable data according to ICAO Doc 9303 standard protected by Basis Access Control (BAC) for travelling in the ECOWAS region, as planned in the future.
- eID - stores sensitive information e.g. address and fingerprints protected by Extended Access Control (EAC 2.0) .
- ePKI - generic IAS (Identification, Authentication, Signature) functionalities
- Payment - payment functionality provided in co-operation with MasterCard.

The card is being developed to carry up to 13 different applications, including taxation and eHealth. From 2019 on the card will also be mandatory for voting in national elections.

The government of Nigeria expects the new eID card not only to be a tool for combating identity fraud, but to enable citizens to participate in the digital world of ePayments, eHealth and eGovernment. To cope with the complexity of such a massive project, the NIMC used the paradigm: build on international standards wherever possible!

USE INTERNATIONAL STANDARDS

Everyone who has ever been responsible for managing the introduction of a new civil registry system, a new electronic passport issuance system, or for issuing a new EMV (a global standard for chip card technology based credit/debit payment cards) payment card can imagine the magnitude of the NIMS project, which incorporates all of these applications within one mega-project and needs to meet international requirements as well.

BENEFIT: INTEROPERABILITY

Basing the eID Card on international standards is key to NIMC. The travel application follows ICAO Doc 9303 part 3 standards. The 3-line Machine-Readable-Zone (MRZ) encodes the defined data to be readable by standard passport inspection systems. The chip stores the card holder's full portrait in JPG2000 format, enabling automatic face recognition features in any ICAO compliant border control system. The data is protected by Passive Authentication and BAC. Nigeria, the most populous country in Africa, accepts ICAO standards as



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the de-facto standard for national identity applications. It also adapts the European EAC standard to protect more sensitive data, such as fingerprints or the home addresses of the citizen.

High security is important, as the multi-application card will not only be used in government-controlled environments, but also by commercial stakeholders such as banks. The payment application uses the EMV standards issued by MasterCard and Visa. The Nigerian government recently approved the additional use of two other payment platforms, Verve and Genesys to give citizens more payment options. NIMS's use of open standards will ensure that the new eID card will have the highest degree of interoperability possible. The card has a magnetic strip which makes it usable in the United States of America.

The new concept faces some drawbacks. While ICAO mandates contactless RFID technology for accessing the chip, the banks associated with MasterCard and Visa preferred a contact-based chip. To use of the existing banking infrastructure of ATMs and Point-of-Sale terminals, NIMC decided on a contact interface for the first 13 million cards. In the near future they plan to use a more expensive dual-interface chip. This shows that international standards might contradict each other, which is a challenge of its own. How ICAO deals with such situations in the future will be an interesting but valid experience.

BENEFIT: ENABLE COOPERATION OF LOCAL AND INTERNATIONAL SUPPLIERS

Following international standards enables Nigeria to procure the various components of the eID card and related IT system from a mix of national and international vendors. The eID cards are currently produced from components provided by five different vendors in Europe, who work closely with national card manufacturers in Nigeria. Card personalization is done by NIMC on site in Nigeria only. It is planned that in the future the body of eID cards will be produced locally.

NIMC acts as the system integrator of this mega-project and faces many obstacles, both from vendors and the public, which worries about data privacy. The lack of understanding of how EMV data works and the limited information on how the NIMS infrastructure is set out, is largely to blame for this misunderstanding. However, the entire experience affords valuable lessons – Nigeria is solving a national problem with an indigenous approach.

BENEFIT: QUALITY ASSURANCE BY FACILITATING TEST STANDARDS

The efforts spent on quality assurance are key to

the success of the project. NIMC engaged HJP Consulting to provide assurance that the eID card is fully compliant with all of the applicable standards provided by ICAO, the EU, German Federal Office for Information Security (BSI), ISO, EMV and many more.

Test specifications have been developed and applied based on test standards, such as the ICAO RF Protocol and Application Test Standards for e-Passports Part 3. Accredited laboratories were engaged for testing the card on its compliance in the field of security, conformity and durability.

Because of the multi-application card scheme, some test standards were partly not applicable and that was a challenge. The ICAO test cases that tested the contactless interface had to be substituted with relevant ISO test cases for contact-based chips. Interestingly, in 2014, the data centres and relevant NIMS infrastructure were certified by the British Standard Institute under the ISO: 27001:2005 and recently in 2015, ISO: 27001: 2013. For the EMV, MasterCard certified their facility in 2014 and recently in 2015 under the General Vendors Certificate Programme (GVCP).

THE CHALLENGE IS CONTINUING, BUT IT IS WORTH IT.

Some Nigerian citizens have already received their eID cards, and as such, the mission of combating identity fraud in Nigeria, though not yet accomplished, is on the path to success. It is an ambitious and well-designed Service Oriented Architected (SOA) infrastructure, which means enabling the eID Card for identity fraud verification has already become a reality in Nigeria.

Nigeria must now scale up the process by increasing the capacities of enrolment centres. This will enable speed and coverage over a shorter time. More cards need to be issued, to ensure that the benefits on other fronts are realized early. Remaining applications on the eID Card, such as the voting, pension, insurance and tax applications, need to be specified in detail to enable the post-issuance activation to take place early enough (particularly the voter applications need to be operational before the 2019 elections).

Because of the economic crisis in Nigeria, the speed of issuing eID cards slowed down recently. But the fact that Nigerian citizens will, for the first time ever, have a tool to prove their genuine identity when travelling or using banking services, is a great achievement already. The tool for plugging leaks and achieving financial inclusion is now in place. The new administration in Nigeria will benefit deeply from this important development. ■

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