

# INFOSECURA



## Three days in Dublin

903 participants  
58 countries  
364 organisations  
112 exhibitors



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## Let's not forget the future of ID



As any of its preceding conferences, 2018 Security Printers in Dublin provided three days of intense discussions and highly informative presentations on the current and the expected future situation in the banknote and the ID sectors of our industry. However, due to its timing, the event that made the most waves had nothing to do with the conference or the exhibition. It was the announcement that the contract for printing the first post-brexite passport of Great Britain had not gone to a British company but to the Dutch/French company Gemalto. One of the unintended consequences was that De La Rue CEO Martin Sutherland could not, as planned, join the CEO of Giesecke & Devrient, Dr Seidemann, in putting the viewpoint of banknote producers in the final panel discussion on the last day. When the Chief Cashier of the Bank of England, Victoria Cleland, agreed to step in at the last minute, the panel ended up being unusual in that three of the five panelists were the heads of the cash departments of central banks. The defence of the continued use of cash by the panel was therefore even more significant as it came largely from the final customers, the central banks.

But 2018 Security Printers was not only a conference for cash but for the whole of the security printing industry. Intergraf is very careful to balance the programme evenly between ID documents and cash, giving full regard to the many areas where the sectors overlap. The subjects in the ID sessions in Dublin ranged from the still unresolved question of Irish passports in the context of Brexit to the problems and the detection of face morphs and travel document designs for 2030.

Both banknotes and ID documents touch on essential aspects of our being: Banknotes, or more generally money, on what we have and ID documents on what we are. Both are in the process of being transformed - if not to say deformed - by new technology. Cash allows us a certain measure of privacy and anonymity, while cashlessness will make our economic beings totally transparent. And the ID sector is subject to the same forces. An article in the New York Review of Books reminds us that "*Passports were invented not to let us roam freely, but to keep us in place—and in check. They represent the borders and boundaries countries draw around themselves, and the lines they draw around people, too. If the passport served as a symbol of belonging to a sovereign nation, and, for the more fortunate, a way to travel outside it, not long from now, the lines will be drawn around our bodies, rather than our countries. As printed papers and analogue technologies are giving way to intricate scans that can identify us by the patterns on our irises, the shape of our faces, and even maps of our veins and arteries, we no longer are our papers; rather, our papers become us.*"

With traditional passports and ID cards, our identity is still with us and (largely) controlled by us. Replace physical documents with biometric data that resides in some database or the cloud and we become passive subjects of data searches.

However far in the future that scenario may be, the possibility of it becoming reality should cause us to pause for thought and value our ID documents more.

The Editor

\* The New Passport-Poor,  
Atossa Araxia Abrahamian, New York Review of Books, May 21, 2018



**2018 Security Printers in Dublin in March provided an insight into the state of the industry and a look at the challenges and opportunities ahead.**

The motto of Intergraf's SECURITY PRINTERS INTERNATIONAL CONFERENCE AND EXHIBITION is "Connecting issuing authorities and solution providers". The last conference, held in Dublin, Ireland, on 21<sup>st</sup> to 23<sup>rd</sup> March fulfilled this motto completely. Among the 903 delegates from more than 58 countries were 163 delegates from central banks, ministries and police forces, which are the key influencers in the banknote and ID document manufacturing industries. 32 central banks were represented, as were 35 ministries and other government organisations and 27 law enforcement organisations. Delegates had 112 exhibitors showing them the latest technical capabilities and product developments of the supply industries to the ID and banknote sectors.

As usual, the programme of the conference was divided into two parallel units - banknotes and ID documents - with an extensive joint session covering subjects that applied to both sectors. Starting with a highly topical talk by cyberpsychologist Dr Mary Aiken, entitled "Cyber: the criminal frontier", the programme ranged from the debate on the future of cash and also that of physical identity documents to very hands-on subjects such as how to prevent counterfeiters getting access to sensitive tools and materials. On the subject of ID document counterfeits, the Dutch police conducted demo sessions and Interpol showed alarmingly accurate

counterfeits of high value Euro notes in their booths and the demo stage.

A series of presentations brought delegates in the ID sessions up to speed on the increasing danger of morphing of passport photographs and in the banknote part, a presentation by Linus Neumann of the famed Chaos Computer Club, looked at the "psychology of cash: a world without it". Even he, as a committed "cyber guy", could not imagine how all the advantages of cash can be replicated in a cyber currency.

The highlight of the conference, a panel discussion on the "Future of cash", moderated by journalist Joy Macknight of the Financial Times/The Banker, brought together Victoria Cleland, Chief Cashier of the Bank of England, who earlier gave a presentation of the BoE's path to polymer banknotes, as well as her colleagues from the US Federal Reserve System and the Central Bank of Norway. The side of industry was represented by Dr. Wolfram Seidemann, CEO of G+D Currency Technology and the voice from outside the industry was again Linus Neumann of the Chaos Computer Club. The consensus was that cash has a future, which it will have to share with other means of payment, such as digital. Alternative currencies, such as bitcoin, will in the foreseeable future probably not have great impact, because, apart from being very volatile, they are not user friendly. And convenience, or user friendliness, has emerged a one of the major drivers in the development of payment systems.



One of the 'soft' benefices of the conference is the chance to network, to meet old and new colleagues and make new contacts. In Dublin, any social event inevitably includes the famous beer Guinness. Consequently the dinner party took place in the historical Guinness Storehouse, with Irish music and food and quite a few pints of Guinness. A good time was had by all.

2019 Security Printers will be held in Copenhagen, Denmark from 23<sup>rd</sup> to 25<sup>th</sup> October 2019. ■



**903**  
participants



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## DE LA RUE'S PASSPORT PAINS

**On March 21st, on the first day of Intergraf's 2018 Security Printers International Conference and Exhibition in Dublin, the UK Home Office - the British interior ministry - made an important and unexpected decision. The ministry awarded the printing contract for the next UK passport not to Britain's De La Rue, but to the French/Dutch company Gemalto, a decision that carried considerable emotional baggage for many Britons.**

The UK passport is seen by pro-Brexit supporters as a - until now, abused - national icon that, after Britain left the EU, would be restored to its pre-EU blue colour from the common burgundy colour most of the EU countries use.

The pro Brexit press, conservative MPs and Brexiters generally, saw this return to the traditional colour as "the first real, tangible victory", an end to "humiliation" and a proud expression of Britain's national greatness. At the time, Brandon Lewis, the UK immigration minister, said: "Leaving the EU gives us a unique opportunity to restore our national identity and forge a new path for ourselves in the world. That is why I am delighted to announce that the British passport will be returning to the iconic blue and gold design after we have left the European Union in 2019", the Guardian wrote.

However, when that decision was made, heads of the ID document producing industry in the audience were unaware of this fact, as the companies that took part in the tender process for the £260m, 11.5-year contract were only informed that evening about who had won the tender. It is unlikely that anyone in the audience thought that the order would not go to De La Rue, the national champion (The last contract in 2009 was worth over £400m).

### AN EARLY WARNING

The decision did not come totally out of the blue. Already in November 2017, The Telegraph, a daily paper close to the UK conservative party, printed a remark by Martin Sutherland, CEO of De La Rue, that his business was on a shortlist of three bidders for the contract to design and print British passports that is up for tender in 2019.

"We have submitted our bid for the renewal, which is in 2019 and will last for 10 years," he said, adding that two other unnamed European companies are also in the running. "It would be a shame if in the year of Brexit the contract was lost and the British passport was not printed by a British company." Winning the £490m contract to design and produce the passport would be important for De La Rue, as the company is working to become less reliant on the money-printing operations that make up the bulk of its revenues, Mr Sutherland said. Retaining the UK passport contract would be a flagship deal, he added.

On March 22, the news was out and Mr. Sutherland, who had been scheduled to participate in a panel discussion on the final day of the conference, had to cancel his participation. Meanwhile in the UK parliament and the press, the government was

heavily criticized about the decision and was urged to withdraw it. But, the government said, the decision was in fact final, in spite of the 10 day "stand-still process", in place for legal reasons. Predictably, Prime Minister Theresa May faced pressure to intervene over what critics called a humiliating symbol of the post-Brexit future. De La Rue's chief executive called on ministers to think again.

### HURT PRIDE

Matt Hancock, the culture secretary, sought to blame EU regulations on procurement. He told a Westminster reporters' lunch: "There is an irony, which is these rules are European rules and we are going to be leaving the European Union and then we may be able to - if we choose to - set out our own procurement rules." May's spokesman said World Trade Organisation rules also covered the same area but argued that Brexit should nonetheless bring more flexibility.

Speaking to BBC Radio 4's Today programme, De La Rue's chief executive, Martin Sutherland, said Prime Minister May or (then Home Office minister) Amber Rudd, should "come to my factory and explain to my dedicated workforce why they think this is a sensible decision to offshore the manufacture of a British icon".

He said he would appeal against the decision, and he refused to guarantee that no jobs would be lost at the Gateshead factory the firm uses to produce the current burgundy EU passport version.

De La Rue's complaints were based partly on the fact that both France and Germany do not offer equivalent tenders, instead producing the documents in-house under a national security exemption in EU procurement rules.

### TIME FOR REFLECTION - AND WITHDRAWAL

To give De La Rue more time to prepare any challenge to the decision, the government extended the 'stand-still' period by two weeks making the date of the final decision April 17th. On the evening of the next day the Home Office confirmed that Gemalto had been given the contract. On the same day, De La Rue said it was dropping the appeal against the decision. The company said it had made the "pragmatic business decision" after taking legal advice and having "considered all options". Martin Sutherland said: "We've done our homework ... on balance it looked unlikely that we'd get this overturned. As a business we have to act in the interests of our staff, on behalf of our customers, of our shareholders and we have to focus our efforts and energies elsewhere. It's a slightly disappointing outcome but that's just the rough and tumble of business."

This ended a campaign that won the support of pro-Brexit MPs, the Labour party and the Daily Mail newspaper. About 330,000 people had signed a petition organised by the Mail calling on the government “to put British workers first by reversing the decision and giving the contract to a British firm”. Yet the Home Office said the winning bidder — Gemalto, which is in the process of being acquired by French defence company Thales — would be £120m cheaper than De La Rue over the 10-year contract. De La Rue had also been accused of hypocrisy, given that nearly 80 per cent of its sales

come from outside the UK, where 65 per cent of its staff are based.

De La Rue also said that operating profits would be “in the low to mid £60 million range” this year, below analysts’ average estimate of £72m, but the current contract still had 18 months to go. The company would therefore not suffer a financial hit in that period. The prediction came true but De La Rue’s financial year-end statement even showed a substantial over-all profit lift due to an exceptional gain from the sale of its paper business. ■

## LOOKING AT NUMBERS

**Reducing the total bill for producing the new, blue UK passport from £400 million to £260 million is astonishing. The British public seems content that money will be saved, but what is behind these figures remains unexplained.**

After the patriotic posturing about the next issue of the UK passport to be produced by a French/Dutch company, but possibly still in the UK, has died down, it is time to look at what the new passport will be and what it will cost to produce.

The costs first. Since 2017, the general press talked about a contract worth £490 million over 10 years to produce the new - non-EU and patriotically blue - passport. We can assume that that was the value of the last passport production contract awarded in 2009 and which at the time went to De La Rue. In a press release in April 2018, the UK Home Office and HM Passport Office, however, talked about the £400 million contract awarded in 2009 and compared it to the new £260 million contract which was awarded to Gemalto and which “will deliver significant savings” and provides “value to the taxpayer” and which will cover 11.5 years, including 10 years of production and issuance services.

Even using the lower figure of £ 400 million, HM Passport Office was driving a hard bargain. The Guardian on March 22<sup>nd</sup> quoted the Home Office as saying: the decision to pick a preferred bidder in the tender would save taxpayers about £120m over the ten years of the contract. This implies that the next contender in the tender process - which may or may not have been De La Rue, as there were three participants in the process - was asking £380 million for producing the passports. Coming down from the previous figure of £490 million or even £ 400 million, means cutting costs to the bone and also being quite optimistic about the financial landscape in the next decade - or has that something to do with one company being in the Sterling area and the other(s) in the Euro area?

This leads to the next question: what is HM Passport Office getting for this astonishing (low) price. Apparently not a cheap knock-off but “the world’s first carbon neutral passport. It will include a complete redesign of the inside pages that will

incorporate the latest developments in secure technologies to keep ahead of forgers and fakers”, the Passport Office states. Just like De La Rue, Gemalto has vast experience in producing passports for a host of countries worldwide and the company is already working for the UK government in a number of areas including the production of UK driving licenses, UK biometric residence permit cards and on e-gates at the border.

The new passport will have a polycarbonate data page, a change from the previous paper one. As the company and the Passport Office promised that it will be one of the world’s safest passports, it may well include Gemalto’s new ‘Color Laser Shield’ technology for placing a colour photo within a polycarbonate data page. It works by “four colour lasers hitting a special ink in the document’s inner structure”, which is said to give “the highest levels of resolution and counterfeit protection”. As for the overall design of the visa pages, Gemalto will work closely with the Passport office, which meanwhile has much experience in delivering interesting and secure passports. But is there hidden within these technical promises a huge cost-saving device? De La Rue said “it has also been suggested that the winning bid was well below our cost price, which causes us to question how sustainable it is.”

While De La Rue hinted that some jobs may be lost in its Gateshead factory, Gemalto said it plans to add approximately 70 jobs to its existing British workforce, which already numbers about 500.

The loss to De La Rue is mainly one of hurt pride to have been shunned on its home turf, apart from the £4 million the company had to write off as preparation expenses for the tender. Both De La Rue and Gemalto are international companies that are well used to the “rough and tumble of business”, as De La Rue CEO Martin Southerland put it, although for him it was a “slightly disappointing outcome.” For the Home Office apparently, it was a win, not counting bruised patriotic feelings. ■



# Cash: don't worry (too much)

Although unstated, what will happen to cash was the main talking point at the 2018 Security Printers International Conference in Dublin. Do we worry too much?

Individual Intergraf Security Printers Conferences and Exhibitions do not have titles. The motto of the conference and exhibition is “connecting issuing authorities and solution providers”. However, the undeclared heading of the last of such conferences in Dublin, Ireland, held from March 21<sup>st</sup> to 23<sup>rd</sup>, 2018 was ‘what will happen to cash?’ Not all that long ago, such a question would have seemed absurd. What can happen to cash? What else is there? We can’t go back to barter!

Well, that was then. Now, whenever an organisation or official body ponders money, the question inevitably comes up: What is the future of cash? Last year, in a speech celebrating the 50<sup>th</sup> anniversary of ATMs, Victoria Cleland, Chief Cashier of the Bank of England, remarked that there are now a myriad of different ways to pay, with digital currencies emerging, mobile payments developing and innovations such as contactless cards gaining real traction. The BoE even considered whether there might be a BoE issued digital currency, but it does not envisage this in the foreseeable future. Other central banks, such as the Swedish Riksbank and the Central Bank of Finland among them, also examined this possibility, but neither has any concrete plans for such a move. Most central banks are neutral in the question of payment methods but all are trying to understand the future demand for banknotes, to be fully prepared to meet that demand.

## CASH DEMAND IS REAL

In spite of the hand-wringing about the demise of cash, the demand for it is real. Fifty years ago, at the dawn of the ATM era, the value of banknotes in the UK in circulation stood at £2.9bn. In the run-up to Christmas 2016, this figure reached over £70bn for the first time - an increase of 10 per cent on a year earlier. This is not unusual, as in

most countries, including the US and the Euro area, banknote year-on-year growth is in the 5 to 10 per cent range; some countries are well in excess of this. Only in Sweden and less so in Norway has the value of notes in circulation been falling. Yet even in Sweden, cash still accounts for around 15 per cent of sales and a new series of banknotes were issued recently. It seems, however, to be clear that transactional demand for cash is falling. In the UK the number of payments made in cash fell 11 per cent to 15.4 billion between 2015 and 2016 - although 40 per cent of all payments and 50 per cent of spontaneous payments were still made in cash. In this, the UK is at the lower end of the scale. In Switzerland, as a recent report (Zahlungsmittelumfrage 2017) by the Swiss National Bank (SNB) showed, 70 per cent of payments are still made in cash. Although most are low value payments, 35 per cent of non-regular payments over CHF. 1000 (approx \$ 1080) are also made in cash.

One important point about cash as a transactional instrument is the relative cost of payment methods to retailers. Whilst in the UK, cash is relatively cheap to process at present - 0.15 per cent of tender value compared with 0.22 per cent for debit and 0.79 per cent for credit cards, the gap is narrowing. Were this to reverse, merchants may look to nudge customers away from cash, Ms. Cleland said.

In the end, the use of cash depends on consumer preference and there are factors that strongly discourage the use of cash. Online shopping, which increased by about 20 per cent in the UK last year, is one of these factors, as is the use of contactless cards, which tripled in 2016 and mobile payments. But this is more an indication of what is to come than a picture of today’s reality. In her speech, Victoria Cleland said that the total value of cash spending in the UK has stayed relatively stable over



the past decade, albeit with a quicker decline in 2016. ATM data shows that the total value of withdrawals has also stayed relatively stable with an average of £192 billion p.a. over the past decade. One argument, used often by opponents of cash is, that it encourages tax evasion and crime. Ms Cleland admitted that there will be some cash used in the shadow economy. However, in the UK the value of uncollected tax has been broadly stable in the last decade, when demand for cash has increased 75 per cent, suggesting that contrary to some commentators, the shadow economy is not a key contributor to the strength of cash demand.

Although non-cash payments have increased, the perception that there is a big shift away from cash is not correct. This is confirmed by a recent paper by the Bank of International Settlements (BIS), which states that cash in circulation and card payments (a proxy for e-payments) have both increased since 2007. Only Russia and Sweden show evidence of substitution between cards and cash.

Demand for cash remains robust around the world, the BIF paper states, except in some Nordic countries. Many countries have seen an increased demand for cash following the financial crisis. Differentiating between “means-of-payment” and “store-of-value” demand for cash, the paper shows that increasing cash demand is driven, partly, by lower interest rates (hence a lower opportunity cost of holding cash) in the post-crisis period.

Since 2000, cash in circulation is up from 7 to 9 per cent of GDP (on average) in a sample of 28 member central banks of the BIS Committee on Payments and Market Infrastructures (CPMI) and 22 additional countries due to primarily an economic uptick in advanced economies following the financial crisis. Overall, a majority of countries saw higher cash in circulation with the largest increases occurring in Hong Kong and Japan (by 9 and 7 per cent of GDP, respectively). In contrast, in China cash demand declined by 5 per cent of GDP.

According to the latest BIS statistics for 2016, cash in circulation is below 2 per cent of GDP in Sweden, but at 20 per cent in Japan. Demand even differs among countries that are otherwise economically and socially similar, such as in the Nordic region. At the start of the 2000s, Iceland’s cash-to-GDP ratio was as low as 1.2 per cent, while Denmark, Norway and Sweden were clustered at around 3-4 per cent. Since then, cash demand declined in Sweden and Norway, while in Denmark it has remained stable at around 3.5 per cent. However, in Iceland, cash demand has more than doubled since its banking crisis, and now exceeds that of Norway and Sweden.

### HIGH-DENOMINATION BANKNOTES

Most advanced economies have experienced a rise in the number of high-value denomination banknotes in circulation. This term itself is very relative. What is a high-denomination banknote? Does a £50 note count, as it is the highest denomination in the UK? And is the US\$ 100 already the top? The most valuable notes currently issued are Switzerland’s CHF 1,000 (\$1,060) and Singapore’s SGD 1,000 (\$760) notes. In contrast, the largest-denomination notes with the smallest value are from China (CNY 100, \$16) and South Africa (ZAR 200, \$17). The relative use of large denomination notes may be an indicator of what cash is mainly used for; for transactions or as store of value.

In its study, the BIS used a uniform threshold across countries of \$75 (purchasing power-adjusted) to distinguish the two components of cash demand. It found that the relative share of total cash in circulation accounted for by large denomination notes varies greatly across the CPMI countries. For Mexico and Sweden, the large-denomination notes comprise less than 10 per cent of the outstanding stock of cash in circulation while in Hong Kong, Japan and Saudi Arabia, these notes constitute more than 75 per cent of the total.

The study concludes that evolution of large- and small-denomination notes suggests that cash is being increasingly used as a store of value. Over the last decade, the demand for large-denomination notes has outpaced that for smaller denominations. In fact, a handful of countries (e.g. Korea and Russia) saw the demand for smaller-denomination notes decline and that for larger-denomination ones increase. Sweden is again an outlier: demand for all notes has decreased since 2007. However, globally cash is holding-up well: there are over 500 billion banknotes in circulation (nearly 80 per adult) and cash accounts for 85 per cent of transactions.

### NO VIABLE ALTERNATIVE TO CASH

Confirming the thoughts of Ms Cleland and the findings of the BIS and the SNB paper, ECB’s Yves Mersch said in a speech in February that, should there ever come a day when cash is discriminated against, the ECB would promptly intervene, because the central bank is the guardian of the eurozone’s legal tender and the Euro must be accepted by all at face value. The ECB has the responsibility to offer all of its citizens, regardless of age, education, gender, health, or race a viable, accessible and easy-to-use payment tool. Today, the only one to fulfil that role is cash. He emphasized that “...printed Euro banknotes will retain their place and their role in society as legal tender for a very long time to come. There is no viable alternative to Euro cash.” ■

# CASHBACKS AND ATMS

**Most people access their cash through cash machines or ATMs. The second EU directive on payment services (DSP2) provides for an additional route, cashbacks, but this should not be to the detriment of ATMs.**

France recently fell in line with the requirements of the EUs' directive on payment services (DSP2) and allowed retailers to dispense additional cash to customers who have paid by card. Cashback, as this voluntary service is called (even in France) will allow people access to cash, especially where ATMs are rare. While the measure seems popular with merchants, the French Banking Federation considers that the new directive might create unnecessary competition between banks and retailers. The banks also think that this measure is 'anachronistic' and runs counter to the efforts of the French government to promote digital payment instruments and restrict the use of cash. France has 58,480 ATMs on its territory, or 104.38 ATMs per 100 000 adults. This puts it among the high-density ATM countries, as a World Bank statistic reveals. And the number of ATMs has been rising steadily. The World Bank statistic shows that in 2004, there were only 85.49 ATMs per 100 000 adults.

The banker's fear about additional competition to ATMs may not be completely groundless. A Bank for International Settlements (BIS) study mentions that in the Netherlands the density of ATMs declined, in part because of a shift towards using the "cashback" option at the point of sale. But the problem seems to be a small one. The ECB states that less than 2 per cent of cash withdrawals are done via cashbacks and the average amount of withdrawals is around € 15. The value of ATM withdrawals in advanced economies saw disparate trends in recent years. Withdrawals as a share of GDP fell for the Netherlands, Sweden and the United Kingdom, stayed unchanged for Belgium, France, Germany and Switzerland, and increased for Italy.

## UK TO REDUCE NUMBER OF ATMS

In the UK there are almost 130 ATMs per 100 000 adults, a figure the county's largest free-to use ATM network, Link, thinks could be reduced - by about 20 per cent over the next four years. Link has also proposed to lower its interchange fee - which is paid by the card issuer to the Link network to keep ATMs going - from 25 pence to 20 pence. The justification given by Link for these moves is that

consumers increasingly use non-cash payment methods. Critics point to the increase in cash in circulation - by 10 per cent in 2016 - (see article p. 6) and to the fact that 76 per cent of transactions in convenience stores were made in cash according to the Association of Convenience Stores report. They see the reduction in ATMs as an attempt to push UK consumers to make greater use of cards, for the benefit of Visa, MasterCard and banks eager to cut costs even further. Banks have already taken radical measures over the past couple of years by closing over 1,700 branches across the country.

Both sides may have a point. According to its website, Link promises to maintain the present geographical spread of ATMs, (presumably in remote rural areas and low-income neighbourhoods as well) with any reduction in the number of ATMs intended to be in areas where there are currently multiple ATMs very close together. Around 80 per cent of free-to-use ATMs in Britain currently are within 300 metres of another free-to-use machine, Link claims.

The Director for the ATM Industry Association in Europe, Ron Delnevo is critical of the plan to lower interchange fees in the UK as they are already the lowest in Europe. As he told "Payments Source", ten years ago the interchange fee was nearly 40p, now it's about 25p. ATMs in the UK continue to be twice as busy as ATMs in France, and almost twice as busy as Germany. He believes this is simply a strategy for banks and credit card companies to increase profits to the detriment of business and consumers.

## A WARNING FROM THE ATM INDUSTRY

In spite of Link's promise to maintain the geographic spread of ATMs, there are fears. Cardtronics, the UK's largest independent cash machine operator, stated in December last year that: "Should Link's proposals to slash interchange be implemented in their entirety, the free-to-use ATM model in the UK will become unsustainable and Cardtronics UK will be forced to convert a much more significant number of currently viable free-to-use ATMs to pay-to-use or even remove ATM sites altogether." So far there are no reports that that has happened.

The BIS report points out that the relationship between ATMs and cash demand is not straightforward. ATMs can both boost and constrain cash demand. On the one hand, by facilitating easy access, ATMs increase cash demand. On the other hand, wider distribution of ATMs can reduce the amount of cash consumers hold, since they can withdraw it as needed. Moreover, it can be difficult to determine whether higher cash demand leads to a greater supply of ATMs or vice versa. ■



**India seems to run out of cash - again. In mid April, ATMs in several states ran out of banknotes and banks had to put limits on withdrawals. Obviously, the experiment to convert India to cashless payments has failed.**



## India's ATM troubles

**O**f late, India seems to have developed a strange relationship with its cash. In late 2016, the Prime Minister, Narendra Modi, 'demonetized' 85 per cent of all Indian cash by declaring all Rs500 and Rs1000 notes worthless. Apart from the economic turmoil that caused, it led to a massive shortage of banknotes, which was only eased when new 500 and 2000 Rs notes were printed. Now, less than 18 months later, ATMs across India displayed again the "no cash" sign. In mid April, cash machines ran dry in eight states and there were bank restrictions on withdrawals. Some bank managers said the cash crunch had been building for months. People were forming long queues outside banks and ATMs, Quartz India wrote.

The government is still trying to work out what caused the crisis, stating the obvious that there was "unusual demand", but guilty or not, it is blamed nevertheless. India's central bank, the RBI, insists that there is sufficient cash in the RBI vaults and currency chests. "Nevertheless, printing of the notes has been ramped up in all the four note presses. The shortage may be felt in some pockets largely due to logistical issues of replenishing ATMs frequently and the recalibration of ATMs (due to the new 500 and 2000 Rupee notes being larger) being still underway. RBI is closely monitoring both these aspects" an RBI press release stated. If Mr Modi's preferred outcome of the currency demonetisation had worked and India's economy would have moved largely to electronic payment instruments, the present crisis would not have happened. But obviously, cash is still king in India, and there doesn't seem to be enough of it going around.

Anecdotally, the country witnesses a cash shortage at the time of elections, according to bankers, and polls in five states are coming up over the next few months, but the coming wedding and harvest season also requires lots of extra cash. In certain pockets, rumours that deposits may be unsafe in

banks have aggravated the problem. Public faith in the safety of India's banks has also faltered over the past year, prompting people to keep more cash at home.

"As panic spreads, people also begin hoarding cash, which contributes to a cash-crunch," said Navroze Dastur, managing director of NCR Corporation, which manufactures and manages ATMs in the country.

"In the current month, in the first 13 days itself, the currency supply increased by Rs45,000 crores," a notice by the RBI press information bureau stated. Usually, the average is around Rs25,000 crore. (a lakh is 100 000 and a crore is 10 million)

In order to meet the demand, the RBI will be printing more notes over the next few days. "We print about Rs 500 crore worth of Rs 500 notes everyday. We have taken steps to raise this production five times. This alone is more than enough," Subhash Garg, the economic affairs secretary said on April 17. He added that there is an additional Rs2 lakh crore of currency in the government and the central bank coffers, brushing aside any cause for alarm.

The New York Times added that following the 2016 currency cancellation, the government did not print enough new bank notes to keep up with India's growing economy, betting that cash-loving Indians would embrace digital transactions. They did not. Meanwhile, hoarders and black market operators started stockpiling 2000-rupee notes, worth about \$30 each. Rather than expanding the supply to compensate, the government decided to stop printing the high-value bills, forcing banks to fill ATMs with lower denomination notes, which run out more quickly. ■

## NEWS

### Europol's new Executive Director

On May 2, 2018, Catherine De Bolle, who from 2012 on served as Commissioner General of the Belgian Federal Police, took over the leadership of Europol – the EU Agency for Law Enforcement Cooperation – from its headquarters in The Hague. She takes over from Rob Wainwright, whose term expired on May 1, 2018 after nine years in service.

Catherine De Bolle's tasks involve overseeing the administration of Europol and the management of its more than 1 000 personnel, as well as the overall performance of the Agency. She was appointed by the Council of the EU as Europol's Executive Director on 8 March 2018.

## SWEDEN'S E-KRONA PROJECT

**As in the article on the Central Bank of Finland's look at central bank digital currency (CBDC) (Issue 75), the interim report of the 'e-Krona project' of Sweden's central bank describes a possible way for it to work, but leaves many questions unanswered.**

In March this year, Sveriges Riksbank published a press release, which stated that *"on certain websites and in social media, claims have been made that it is possible to purchase e-Kronas. The Riksbank has also been contacted by individuals describing how they have been called by companies claiming to be selling e-Kronas on behalf of the Riksbank."*

*In 2017, the Riksbank started a project aimed at examining whether the Krona needs to be issued in an electronic form, an 'e-Krona'. The project has not been concluded and no decision has been taken on issuing e-Kronas. However, please contact the Riksbank if you come across an offer to purchase e-Kronas."*

The fact that the Riksbank was compelled to issue such a press release means that we have to start to take the possibility of central bank digital currency (CBDC) seriously. It is said that Sweden could be effectively without traditional cash in five years. The Riksbank is not necessarily happy about this trend, and has voiced its support for retaining cash, but it needs to be ready to supply the population with the means of payment it wants, should that day arrive. The amount of cash in circulation in Sweden last year dropped to the lowest level since 1990 and is now more than 40 per cent below its 2007 peak. The declines in 2016 and 2017 were the biggest on record.

Among the reasons for the steep decline of cash is Sweden's unique commercial law that allows shops to overrule the central bank law requiring companies to accept Swedish Krona. If a store has a sign saying that cash isn't accepted, and many of them do, then it's assumed that its customers have entered into a legal agreement to exclusively use electronic payments.

Riksbank is worried that the rapid disappearance of cash will ultimately lead to the disintegration of the infrastructure needed to use notes and undermine its task to promote a safe and efficient payment system. To avoid such a scenario, Swedish cash-handling provider Loomis AB wants authorities to force banks and retailers to continue accepting cash. Loomis Chief Executive Officer Patrik Andersson said in an interview that Sweden's more remote areas in the north are most at risk of losing access to cash and this would be worrying in the event of natural disaster or a technological breakdown. "Cash is important in a crisis situation," Andersson said.

Sveriges Riksbank and Loomis AB have at least some of the public behind them. A 2016 Riksbank survey found that 31 per cent of respondents were not comfortable with the current cash decline, compared to 24 per cent only two years earlier, although most also use alternative payment methods. But it proves that there is a growing awareness about the risks related to a fully cashless society, particularly for the elderly and the unbanked, but also for security reasons.

### THE GOVERNMENT TAKES NOTE

US business journal Bloomberg writes that a Swedish parliamentary committee reviewing the broader framework for the Riksbank, plans to publish a special report this summer looking at the challenges posed by declines in cash usage. Riksbank Governor Stefan Ingves in April called for legal changes to safeguard the central bank's governance of the payment system amid the rapid decrease in the use of cash.

As less cash is used, the cost for retailers and banks to provide notes and coins increases. The cost banks pay for each ATM transaction has been increasing quite dramatically in recent years.

All this offers ample justification to Sveriges Riksbank to look seriously at the question of what it would really mean to issue a central bank digital currency (CBDC). In 2017 Riksbank started the "E-Krona Project" which recently published its first interim report.

### INVESTIGATING CENTRAL BANK DIGITAL CURRENCY

The Sveriges Riksbank e-Krona project is investigating whether it would be possible to issue a digital complement to cash, an "e-Krona", and whether such a complement could support the Riksbank in the task of promoting a safe and efficient payment system.

An e-Krona would give the general public access to a digital complement to cash guaranteed by the state and several payment services suppliers could connect to the e-krona system. By functioning independently from the infrastructure used by the commercial bank system, the e-Krona system could also make the payment system more robust in the event of disruptions of, for instance, the system for card payments. The bank fears that a national payment system entirely driven by private actors and operated by a small number of commercial participants and payment services could in the long run restrain competitiveness in the market and make society vulnerable.

The development of an almost cashless society



also means households having little opportunity to save and pay with risk-free central bank money and this can ultimately lead to a decline in the resilience of the payments system. In a crisis “when demand for cash can be assumed to increase, it would take considerable time to get the distribution of cash to different participants to function, even if the Riksbank was ready and prepared for this eventuality. In the event of systemic shocks, there is a risk that there would be no rapidly available free-standing alternative such as cash is at present,” the report states.

### TWO MODELS FOR THE E-KRONA

The bank is looking at two models for an e-Krona; a register-based and a value-based one. With the register-based model, the money held by a person would be stored in an account in a central database, while a value-based solution would be more like cash is at present, as the value would be stored locally in an app or on a card.

A simple value-based solution would have a more limited potential for development than a register-based one, but it might possibly be introduced more quickly. A register-based solution would be more complex, but it could be extended in stages later. The project proposes a combination of the two models, where a register-based solution is supplemented with a value-based e-Krona that is primarily suited to small payments offline. The value-based solution will make the e-Krona more accessible to groups that are unable or unwilling to have e-Krona accounts and the solution can be further developed to meet special groups’ need for basic payment services. The e-Krona project has not recommended a possible technology.

The e-Krona should pose no major obstacles for monetary policy, the payment market or financial stability. The Riksbank would determine the supply of e-Krona in the same way as it currently determines the supply of banknotes and coins.

The e-Krona project provided the following description:

- The e-Krona is primarily intended for smaller payments between consumers, companies and authorities.
- It constitutes a direct claim on the Riksbank, is specified in Swedish Kronor and can be held by the general public, financial institutions and companies.
- It is accessible in real time, 24 hours every day.
- The e-Krona does not accrue any interest, but should have a built-in function to make it possible to accrue interest at a later point.
- A register-based e-Krona is combined with a value-based solution that makes offline

payments of small amounts possible and increases their availability for groups that do not want to or cannot have e-Krona accounts.

- The Riksbank provides the basic functions for the e-Krona, but is investigating the possibility of using the existing digital infrastructure and inviting external actors to propose solutions for end-user interaction.

### OPEN QUESTIONS

The interim report of the e-Krona project did not deal with the differences between a digital currency and ‘real’ cash. There is for example the question of anonymity in a register-based system and the finality of a transaction. It would, however, work well as a store of value, as long as interest rates are low.

Physical cash and digital money are sufficiently different as not to be seen as competitors, although they are. In the total absence of cash, to convince the population of the need to have digital money that is issued by the central bank requires a level of sophisticated understanding of the role of money in a national economy that can probably not be expected from the general public. If central bank digital cash comes in a card or smart phone app, as does money issued by banks or card companies, the consumer needs to quickly choose whether to use a credit or debit card or the central bank cash card. The future of the national payment system will not immediately enter into his/her decision process. One can see how much cash one has in one’s wallet when making a purchase. With a central bank digital card/app that is not immediately obvious. Additionally many banks and credit card companies allow for an overdraft, which physical cash as well as CBDC, by definition does not. Present digital payment systems seem more or at least as convenient as a future central bank one.

It would require an enormous educational effort to convince the public of the vulnerability and fragility of the private banking system or a massive failing of it to convince the public that it is prudent to have an account with the central bank.

On a more general level, if a large part of the money in circulation would be diverted to the central bank system it would leave commercial banks short of cash to lend out. The present equilibrium between central bank money and commercial bank money would be disturbed.

And as a final point, digital money regardless of issuer, can never be as fully independent of technical infrastructure as physical cash is. As last year’s catastrophic hurricane in the US island of Puerto Rico showed, that may be one of the strongest arguments in favour of cash. ■

# Standardisation and Individualisation



Bernd Kümmerle

**Looking at new banknote emissions from Armenia, Norway and Switzerland, cash is obviously more than just a means of payment. Banknotes are a representation of the country that issues them, of its history, its culture and its values. But they still have to be worth the price tag they come with through their performance in the cash cycle. It comes down to standardisation and individualisation when offering banknote issuers beautiful and efficient banknotes at prices they are willing to pay. Bernd Kümmerle explains how his company, G+D Currency Technology, is squaring the circle.**

In a conversation on the sidelines of the 2018 Security Printers Conference in Dublin, Bernd Kümmerle, Head of the Banknote Solutions Division of Giesecke & Devrient Currency Technology, with Infosecura's editor, outlined his view of the current state of the industry. Overall the industry is changing faster than ever, he said. Although there is global growth in the banknote field, the reasons for the surprisingly swift changes are strong global competition and fluctuating demand in countries important for the market. This affects banknote printing

and the supply of banknote substrates, with the latter being the most dynamic at the moment.

There were several recent market changes, such as the sale of US company Crane Currency, a producer of banknote paper and a banknote printer, to US company Crane Co, which is, in spite of the name, a totally unrelated, diversified engineering company. There also was the sale of Swiss currency substrate maker Landqart to the Swiss National Bank, the sale of De La Rue's paper business and the exit of Joh. Enschede in the Netherlands from the currency market. What these changes mean for the market is still unclear. But there might be more to come.

## UNDERLYING FACTORS

While cash is a highly individual product, it is produced on an industrial scale. Each issue has a different aesthetic - a factor that seems to become more important than ever - and different technical circulation demands and a different security architecture. In spite of its 'bespoke' nature, cash and the cash cycle must be efficient, both in terms of functionality and cost. There is considerable pressure on prices in banknote development and production and markets are volatile. However, cash is not a commodity - each banknote series is tailored to the specific requirements of its issuer. This calls for the closest possible co-operation with customers as well as standardization over the complete value chain, while retaining the differentiating factors and delivering on price, time and quality as well. The overwhelming need for collaboration between the industry - printers and substrate manufacturers - and their customers, the central banks, is obvious.

## THE BASICS

Talking about his company, Mr. Kümmerle said that G+D Currency Technology offered a unique value proposition to its customers as it was the only fully integrated company in the market, covering the complete cash cycle, thus constantly improving and further developing its products, solutions, and services at every stage and ensuring compatibility and integrity of the solutions. This secures its position as innovation and technology leader, but only if a collaborative approach is offered to the customer. It is necessary to closely work together to arrive at the best individual solution, which is a cultural, technical and economical fit.

He said that companies need this expertise across the whole value chain as the synergy between substrates, security features, design and printing are crucial in order to design the best products and solutions. Automation and digitalization are crucial to improving efficiency in operations and the cash cycle in general. Today, designing and producing banknotes does not end with the delivery to the central bank in question. How banknotes perform in all stages of the cash cycle is increasingly important - from manual handling by the public through use in vending machines to automated banknote processing, e.g. in a cash center. For those customers not exclusively driven by price and turn-around times, the priorities are quality, system expertise, and technology. The strategy of his company builds on precisely these factors, Mr. Kümmerle said, with a focus on individual customer requirements, and a collaborative approach.

## BANKNOTES AS EXQUISITE PIECES OF ART

Cash has to remain an attractive form of payment, which can be achieved with security features that are as aesthetically pleasing as they are technologically sophisticated, such as e.g. the micro-mirror-based threads and foils such as Galaxy and RollingStar LEAD stripe and patch features. Banknote production is, apart from its economic, political and cultural importance, a business. Quality, reliability, and flexibility are major factors when lead times are short. Kümmerle stressed that the production processes of his company are organized using methods from the LEAN, SixSigma and Digital Operations (in Germany called Industry 4.0) in order to achieve stable organizational and technical processes, transparency, short delivery times and competitive cost of the products. Deliver what customers expect, more quickly and in a more focused way - across all areas and all levels of value creation. One important aspect of this approach is collaboration between customer and banknote producer.

As an example of successful collaboration, Mr. Kümmerle cited the Armenian 500 dram collector's





note, which features Noah's Ark as its main motif. The most eye-catching feature of the note is the reliquary, a shrine where according to the tradition of the Armenian church, a fragment of the Ark is kept. The high gloss depicts the value of gold. The wooden plank and the cross above it are created using the "RollingStar LEAD" security feature from Louisenthal. Millions of tiny micro-mirrors are combined with other optically variable effects. These create bright, striking and dynamic movements, and eye-catching color shifts from gold to green that move along the foil when tilted

and emphasize the quality of the note. The motif of Noah's Ark is included several times in the note, as a watermark; in the LaserCut window, where it can be seen when light shines through it; and on the front of the note.

The note was designed and developed step by step in close collaboration with the customer, from the motifs down to the last security feature, combining art and high technology, "Sometimes the customer leads, sometimes we do – it is a joint and collaborative give and take" he said. The note has won the Regional Banknote of the Year award for the EMEA region (Europe, the Middle East, and Africa) at the 2018 High Security Printing Conference in Warsaw.

#### STANDARDIZATION AND INDIVIDUALIZATION.

What sounds like a paradox, is in reality a complementary approach Mr. Kümmerle said. We have to standardize where we can (in operations, in processes, in material) in order to get the processes and quality stable and the price right and we have to individualize wherever the customer requires it and wherever it means added value for the customer in order to be able to satisfy his individual demands. ■



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**Many developments in modern commerce seem to have nothing to do with the diminishing role of cash in our lives. They seem to be about convenience and efficiency only. And yet, almost every time a new smart app becomes popular, cash loses a bit of territory to convenience. The main weapons in this silent war are artificial intelligence and the smartphone. Do we have the means to resist?**

**W**e are in an age of unintended consequences - or perhaps, that should be better "unknown consequences". The use of GPS (global positioning system) made it possible for a company like Uber to recruit drivers that were not terribly familiar with the geography of a given city as taxi (or Uber) drivers. Why would a prospective cabby e.g. in London do two years of "knowledge", learning to know how to get best from any one point in London to any other one, if anyone who can look at directions given on a small in-car screen and listen to artificial voice commands, can do the same without any training or 'knowledge' at all? And they don't even have to deal with bothersome cash and with the accounting of fares to their employer, as Uber rides are cashless.

One of the biggest introducers of 'unknown consequences' is the giant US Internet retailer Amazon, who sells almost everything everywhere - of course cashless. But while Amazon happily forsakes physical cash, the company is thinking about a revolutionary concept: physical shops. It recently opened a totally automated supermarket in Seattle, USA, called AmazonGo. To go through the Subway or airport-like entrance gates, one needs to have the shop's smartphone app. Shoppers leave the store through those same gates, without pausing to pull out a credit card. Their Amazon account automatically gets charged for what they take out the door. Amazon uses arrays of small cameras to see and identify every item in the store, without attaching a special chip to every can of soup. There are no supermarket trolleys, no check-out and no queues. There are companies elsewhere that think along the same lines. In China, the grocery chain Hema, operated by the Internet giant Alibaba, is experimenting

with ways to automate shopping in its stores. The New York Times said that there is a global race to automate retail stores underway among several of the world's top retailers and small tech start-ups, which want to shave labour costs and minimize shoppers' frustrations. They are also trying to prevent Amazon from dominating the physical retail world as it does online shopping.

High-tech systems like the one used by Amazon Go completely automate the checkout process, a further worry for the retail work force, already threatened by the growth of online shopping. An analysis by the World Economic Forum said 30 to 50 per cent of the world's retail jobs could be at risk from such technologies. That is a maybe, however, a certainty is that none of the automated retail shops will accept cash.

New start-ups are seeking to give retailers the technology to compete with Amazon's system. One of them, AiFi, is working on cashierless checkout technology that will be flexible and affordable enough that mom-and-pop retailers and bigger outlets can use it. In the United States, venture capitalists put \$100 million into retail automation start-ups in each of the past two years, up from about \$64 million in 2015, according to Pitchbook, a financial data firm.

While such technologies without doubt can make shopping more convenient, there may also be consequences that people find less desirable. Retailers like Amazon could compile reams of data about where customers spend time inside their doors, comparable to what Internet companies already know about their online habits. Amazon knows already much about what online customers buy and what they watch. Now it will even know how people move around their shops and what they are looking at before they decide to put it into their shopping bags.

#### **WE NEED TO FIGHT OPENLY FOR CASH**

In military circles, one would call these developments, from shops and cafes in Sweden that display signs like "no cash please" to banks that neither accept nor dispense cash, and now to shops that theoretically need no humans to serve customers, 'distributed and asymmetrical warfare'. But now the cash industry is fighting back by going public. Last year, leading security printing companies and their suppliers came together to create the International Currency Association, which is running a very effective website called 'Cash Matters'. Cash Matters ([www.cashmatters.org](http://www.cashmatters.org)) offers authoritative and accessible facts, figures, and news for consumers, journalists and industry experts alike and gives a platform to pro-cash movements and petitions. The story of cash is finally being told. ■



# De La Rue's path to the future

**A new company strategy was the reason for De La Rue's exit from the security paper market. This will mean greater investments in technology related to currency and ID and also to product authentication.**

The news in the security printing community just after the last Security Printers Conference in Dublin was dominated by the saga of the contract for producing the next UK passport going to Gemalto, instead of the UK based company De La Rue (See articles p.4-5). But in the run-up to the conference, say in February and March, the dominant news was that De La Rue had sold its paper business. In a conversation just before the story of the passport tender broke, De La Rue Marketing Manager Robin Mackenzie said that that decision had nothing to do with external changes in the banknote paper market, but was due to the internal decision of De La Rue to transform itself into a less capital intensive, technology-led product and service provider.

The banknote paper market had recently been more volatile than usual, witness the sale of Swiss paper-maker Landqart to the Swiss National Bank and the difficulties of Italian paper maker Fedrigoni. It is believed that this was a knock-on effect of India's sudden need for banknote paper after demonetisation, which ended when the demonetized notes had been replaced. Globally, after these events, the market for banknote paper was relatively stable.

The reason for De La Rue selling the 90 per cent of its shares in its Overton and Bathford mills to Epiris at this point, was that the company made the decision not to make any further investments in the paper business to free capital for further investments in areas that had been identified as priorities. The sale also provided additional capital to this end. The sale and the subsequent establishment

of the new company Portals De La Rue also frees De La Rue from exposure to the external paper market, which is bound to become more difficult as some large customers, e.g. India, strive to become self-sufficient. The supply of paper De La Rue needs for its print customers is assured by a ten-year supply contract with Portals De La Rue.

Asked whether the move indicated a stronger role for polymer banknote substrate at the expense of paper, Mr Mackenzie did not expect a great sudden shift. However, De La Rue is now co-supplier to the Bank of England for its polymer notes and it saw good growth in this sector, doubling output to 810 tonnes and reaching 11 per cent market share. But 93 per cent of the world's banknotes are still printed on paper. And De La Rue had no plans to add any hybrid polymer/paper solution to its substrate offering.

The paper business aside, De La Rue is and will remain a global company, doing business with 140 countries around the world. It has four regional sales teams and apart from the UK, three overseas production facilities, in Malta, Sri Lanka and Kenya. These are long established factories, the one in Malta was established 40 years ago, the Sri Lanka one, which is a joint venture with the national government, 30 years ago and Kenya has been operating for 25 years.

Asked in which direction the company would like to develop in the near to medium future, Mr Mackenzie said that De La Rue already had three important pillars: currency, which accounts for about two thirds of the business, citizen identity, which includes the passport business, and product authentication. Each of these areas is capable of further growth and development. In the currency section, the polymer substrate will increase in importance and further emphasis will be given to the development of advanced security features. The ID area will also see further growth, primarily in the direction of digital applications and features.

Finally in the product authentication segment, there is a need to support governments through developments in tax stamps, etc. and also to engage more actively with commercial brand protection. This market is large and growing, it is said to be worth \$1.7 trillion, but it is still immature and very fragmented. Here De La Rue sees good opportunities, as the company has the reach, the relationships and the physical and digital assets. Commercial and brand counterfeits are a world-wide and serious problem and given its anti-counterfeiting expertise in the banknote and ID segments, De La Rue is well placed to provide an effective service to the private and the public sector - and come closer to its strategic goals in the process. ■

## A NEW DIMENSION IN CYBER PAYMENT FRAUD

**Counterfeiting currency is a crime that attracts severe punishment, needs great skill and difficult to obtain resources. In cyber payment fraud, the skills and resources are more easily available and the potential pickings much larger. So that is where criminals go, finds Europol.**

We all know that counterfeiting money is a crime, because it can destroy the trust in a currency and damage the economy. Counterfeiting also forces central banks and the banknote producing industry, to invest much capital in making banknotes counterfeit resistant. If we would compare the cost of improved printing techniques and banknote substrates, ever more sophisticated security elements and machine readable features, with the nominal value of counterfeit notes, the former would probably be significantly higher than the latter. However, this would be an equation impossible to do, as any reduction in banknote security would inevitably lead to a corresponding increase in counterfeiting. But while the costly fight against counterfeiting must continue, much greater sums of money are lost through cyber crime, without, apparently, leading to a corresponding loss in confidence in digital money transactions.

### EUROPOL'S WARNING

Europol, the EU's law enforcement agency said that according to the most recent Internet Organised Crime Threat Assessment (IOCTA), cybercrime is becoming more aggressive and confrontational. This can be seen across the various forms of cybercrime, including high-tech crimes, data breaches and sexual extortion. This is a growing problem for countries, such as EU Member States, where internet infrastructure is well developed and payment systems are online.

But it is not just financial data, but data more generally, that is a key target for cybercriminals. The number and frequency of data breaches are on the rise, and this in turn is leading to more cases of fraud and extortion.

The sheer range of opportunities that that cybercriminals have sought to exploit is impressive. These crimes include:

- using botnets-networks of devices infected with malware without their users' knowledge, to transmit viruses that gain illicit remote control of the devices, steal passwords and disable antivirus protection;
- creating "back doors" on compromised devices to allow the theft of money and data, or remote access to the devices to create botnets;
- creating online fora to trade hacking expertise;
- bulletproof hosting and creating counter-anti-virus services;
- laundering traditional and virtual currencies;
- online fraud, such as through online payment systems, carding and social engineering;

- the online hosting of operations involving the sale of weapons, false passports, counterfeit and cloned credit cards, drugs, and hacking services.

### A NEW DIMENSION IN PAYMENT FRAUD

Some of the payment crimes are of a scale that traditional, non-cyber criminals hardly even dreamed of. In March this year, the leader of the crime gang behind malware attacks that targeted over a 100 financial institutions worldwide was arrested in Alicante, Spain. The cybercrime gang attacked banks, e-payment systems and financial institutions using pieces of malware they designed, known as Carbanak and Cobalt since 2013. They struck banks in more than 40 countries and caused cumulative losses of over € 1 billion for the financial industry. The magnitude of the losses is significant: the Cobalt malware alone allowed criminals to steal up to € 10 million per heist.

### MODUS OPERANDI

The organised crime group started its high-tech criminal activities in late 2013 by launching the Anunak malware campaign that targeted financial transfers and ATM networks of financial institutions around the world. By the following year, the same coders improved the Anunak malware into a more sophisticated version, known as Carbanak, which was used until 2016. From then onwards, the crime syndicate focused their efforts on developing an even more sophisticated wave of attacks by using tailor-made malware based on the Cobalt Strike penetration testing software.

In all these attacks, a similar modus operandi was used. The criminals would send out to bank employees spear phishing emails with a malicious attachment impersonating legitimate companies. Once downloaded, the malicious software allowed the criminals to remotely control the victims' infected machines, giving them access to the internal banking network and infecting the servers controlling the ATMs. This provided them with the knowledge they needed to cash out the money.

### CASHING OUT

The money was then cashed out e.g. by ATMs that had been instructed remotely to dispense cash at a pre-determined time to a gang member waiting beside the machine to collect the money. Or the e-payment network was used to transfer money out of the organisation and into criminal accounts, or databases with account information were modified so bank accounts balance would be inflated, with money mules then being used to collect the money.

The criminal profits were also laundered via crypto currencies, by means of prepaid cards linked to the cryptocurrency wallets.



**DISMANTLING A CRIME ORGANISATION**

Dismantling a crime organisation where the master-mind, coders, mule networks, money launderers and victims were all located in different geographical locations around the world was a difficult undertaking that required coordination, which was

lead by Europol's European Cybercrime Centre (EC3) which facilitated the exchange of information, hosted operational meetings, provided digital forensic and malware analysis support and deployed experts on-the-spot in Spain during the action day. ■

## THE BIRTH OF A COMMEMORATIVE BANKNOTE



The final design

**Designing commemorative banknotes requires a maximum of sensitivity from the designers. If the issuer is in a very different country with a very different culture, the task becomes a high-wire act of diplomacy and collaboration. For this note it succeeded brilliantly.**

Designing a modern banknote often means expressing what the country that issues it, considers as its most salient characteristics. And that is usually not only one but a series of them. Consider the last series of Swiss banknotes. Each note depicts a typically Swiss characteristic, which is then illustrated graphically using a key motif. Each characteristic is communicated via an action, a Swiss location and other graphic elements. The inspiration behind the new series was “the many facets of Switzerland” and e.g. the 10 Franc note illustrated the Swiss talent for organisation by taking ‘time’ - as in things ‘run on time’ - as the note’s main motif. This concept shows that an in-depth familiarity with the culture, history, economy and the preferences of its population is required to create a visible image of this aspect of the country. The designer of the new Swiss banknote series,

Manuela Pfunder, had all the artistic and intellectual requirements for the job and she carried it out brilliantly.

Based on her work for the Swiss National Bank, she was asked to design a banknote to commemorate the birth of Crown Prince Jigme Namgyel Wangchuk who was born on Feb 5, 2016 to the Kingdom’s Fifth King Jigme Khesar Namgyel Wangchuk and Queen Jetsun Pema. Bhutan is probably only in very few aspects similar to Switzerland: it is very mountainous, it is small and fiercely independent. The kingdom in the eastern Himalayas is different in most other aspects: it is mainly Buddhist, the people have great respect and affection for the king and the royal family and the traditions of the country are seen as defining elements. Manuela Pfunder said in her presentation at the Security Printers Conference in Dublin that “designing a commemorative banknote means dealing with contradictions and trying to fuse them. In commemorating the royal birth of Bhutan’s crown prince with a 100 Ngultrum Banknote “we had great respect for developing a design for a culture other than ours. We knew that our view would always remain the view from an outsider.”

That respect for a different culture meant accepting and using in an appropriate way the symbols of the crown, the state and the religion. In the culture of the country, elements such as colour, the royal seal, the seal of foundation and the dharma wheel all have very specific meanings and follow certain hierarchies. Another important characteristic is the reverence paid to ancestors. But apart from these, the note also had to communicate the very human aspects of a family with a small child and the beauty of the country.

**FOUR DESIGN PROPOSALS**

Manuela Pfunder proposed four different designs. All of them had the royal colour - yellow - in common. The first proposal showed the young crown prince, his parents and Zhabdrung, a 16th century ancestor, first king and founder of the state, with the royal crest and the seal of foundation. The second one placed greater emphasis on the infant crown prince, who appeared not only as the main



The four design proposals

portrait but also in a window as the centre of the seal of foundation. This version also added a royal dragon as an intaglio line drawing and as

an iridescent colour feature. The 16th century ancestor, became the watermark. Proposal three had the young prince again in centre position, with his parents in the watermark. Proposal four played much more with graphic elements, overlaying the dominant portrait of the prince with the line structure of the dharma wheel and on the reverse side centering the seal of foundation on the eye of the Zhabdrung. Each proposal was a subtly different interpretation of the significance of ancestry and the past and the future of the country.

#### THE FINAL DESIGN

The final design differed significantly from the first proposals. The main intaglio portrait of the crown prince was changed to one where he is no longer a small baby but a laughing little boy, with his parents, the fifth king, King Jigme Khesar Namgyel Wangchuck and Queen Jetsun Pema, to the side of him. The title of the note now is "Commemorating the first birth anniversary of HRH the Gyalsey". The fourth king, King Jigme Singye Wangchuck, is seen as a watermark next to the royal couple. The royal crest is made vibrant by the SPARK Truspin feature and there are many other security features such as a see through feature, micro-perf, iridescent ink, a security stripe, etc.

The Swiss company Orell Füssli Security Printing Ltd originated and printed the banknotes. ■

## EU COMMISSION PROPOSES MANDATORY ID BIOMETRICS

The EU Commission proposed in April this year to improve the security features of EU citizens' identity cards and non-EU family members' residence cards. With an estimated 80 million Europeans currently having non-machine readable ID cards without biometric identifiers, the aim is to curb the use of fraudulent documents by setting common security standards across the EU in line with the minimum security standards set out by ICAO.

This does not mean that countries that do not issue official ID cards - Denmark, Ireland and the UK - are now required to introduce them, but those countries that do use them, now need to include two pieces of biometric data: an image of two fingerprints and a facial image. Non-compliant cards should be phased out within five years, and non-machine readable cards within two years. New cards should be valid for no more than 10 years.

The Commission said that the proposal will create interoperability between the different national ID cards. Although, in contrast to passports, ID cards

are mainly used for domestic purposes, those issued by EU member countries, even if they are not compulsory, as in Austria, can be used as travel documents within the EU.

Some EU countries are already using the eID functions. Germany introduced eID cards with a chip that contained the name, address and a portrait photo already in 2010. At that time, these cards could also contain fingerprints, but these were not compulsory. It also had a PIN number through which the name, date and place of birth could be transmitted, but the use of this function was also voluntary. Generally the functions of the chip were not widely used. However, in April 2017, a new national law was passed that made the automatic activation of the chip functions in the German eID card mandatory, a move that was one year later confirmed by the proposed EU law. All new eIDCards in Germany are now issued with the chip function already activated. By introducing these upgraded standards, the EU proposal follows a similar approach to that taken already by the EU for the security features of passports. ■





## A celebration

**Poland is celebrating the 100<sup>th</sup> anniversary of its national re-emergence in style by issuing a new passport that pays tribute to technical progress as well as to its many-faceted history.**

**A**t the Security Printers Conference in Dublin in March, Joanna Gurtowska of Polish security printers PWPW presented the new Polish passport, which will be issued this year. The presentation was mainly technical and the new passport is certainly a high security product, totally in line with the best in Europe. But that was not all that could have been said about the new document. What Ms Gurtowska barely mentioned was the historic significance of the new passport. The timing of its release is to pay tribute to the 100th anniversary of Polish independence. To be historically correct, that should be “re-establishment” of national independence, as Poland has been an independent nation since 966, merging in 1569 with the Grand Duchy of Lithuania to form the Polish-Lithuanian Commonwealth, that stretched from the Baltic Sea to the Black Sea. In the 18th century, three successive partitions by Prussia, Russia and Austria brought the country to an end, at least for the next 123 years, until in 1918 a new Polish state was resurrected.

### HISTORY GETS IN THE WAY

Modern passports often have background pictures on the visa pages, depicting some features of the country. For Poland it was logical to make history the main subject of the “centenary” passport. However, there are few subjects as difficult and fraught as history in Poland. There are some historic figures from the last 100 years that are safe and could not be missed, such as the founder of modern Poland, Józef Piłsudski and Ignacy Paderewski, a famous pianist one of its first Prime Ministers.

The Polish government wanted the new passport to represent as wide a picture of Poland and its culture as possible and gave a list of subjects and places for online voting to the population. The list included non-controversial things like modes of transport and monuments such as the presidential palace, etc. but there were two suggestions that proved very contentious. One depicted the ‘Dawn Gate’ in the Polish city of Wilno, the city’s premier architectural monument but also an important symbol of Polish history, and the other a portion of the

Lychakiv Cemetery in Lwów, where Polish freedom fighters are buried. The problem is, that Wilno is now Vilnius and is the capital of Lithuania - it was in Poland until 1939, as was Lwów, which is now Lviv in Ukraine. Both the Lithuanian and the Ukrainian governments protested to the Polish one about the inclusion of places which are (now) in their country in the passport of a neighbour. The issue has now been resolved and it is unlikely that either place will be shown in the new passport.

### THE NEW POLISH PASSPORT

The new Polish passport design, which is now being examined by several government ministries, will probably be issued in late 2018, perhaps to coincide with the great national independence celebration. It has a number of features that are not common on other EU passports. The cover, in the standard burgundy red, shows the name of the country and of the European union, as well as the Polish eagle hot-stamped in gold, but on the back, the outline of Poland, the letters RP and the number 100 are embossed on it. Under UV light, the cover is dark with the letters RP outlined in green. The polycarbonate data page has an extensive array of security features from a transparent hologram that partially covers the primary portrait, to embossed matt element over the portrait, guilloches around the secondary portrait up to the edge of the page, micro printing and rainbow printing as well as a security stripe that is UV light sensitive. Under 365 nm UV-light, the page shows the Polish eagle in green and blue, the latter of which switches to red/violet under 313 nm UV light, with the date numbers 1918 and 2018 also becoming visible in red/violet and green respectively. The title page, the front page of the data page, shows the Polish crest as an RGB element under UV light as well as the dates 1918 and 2018 in green.

The internal cover pages have the words Rzeczpospolita Polska (Republic of Poland) in rainbow printing above a shield with the letters RP as a Spark OVI feature and the Polish eagle in intaglio printing above a band of latent image printing showing again the dates 1918 and 2018 in intaglio and offset micro printing. Under UV light the internal cover pages show a blue patterned background with a wide central area glowing red/violet with coloured micro fibres becoming visible.

The 100 year anniversary theme is carried through to the multi-tonal and electrotone registered watermark of the visa pages, which employ a.o. see through register and rainbow printing. This description of the security feature is far from complete and it shows the determination of the Polish government to compete with the best modern passport technology has to offer. ■

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