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A flash of optimism

The most important message in this issue of Infosecura is the confirmation that the next conference Intergraf Currency+Identity will be held in Lyon, France, on April 6 to 8, 2022. In 'normal' times this would be just a matter-of-fact statement, but we are not yet in normal times. It is therefore a statement of intent, courage and hope. In many countries the situation regarding Covid-19 is improving and travel, e.g. between Europe and the USA, is again possible. Intergraf is confident that in April, we all will all be able to gather in Lyon. Registration to the conference is now open. The relevant information can be found on the Intergraf website 'intergrafconference.com.

Among the other important subjects in this issue is one, that is running subliminally through both the banknote and the ID document part. It is the attractiveness of our banknotes and ID documents. Looks matter, especially for banknotes and there are enough people who appreciate a well-designed note and have pleasure in using it. We also look at some of the advances, suppliers of security features made not only in increasing security, but in extending the aesthetic appeal of these features. Often, improving looks also improves functionality and security.

The perpetual conflict between physical and electronic money and ID documents is another subject of this issue. We report on the elevation of Bitcoin to the exalted status of national currency in El Salvador and its total exit, both for creation and use, from China. We also point out that cryptocurrencies, such as Bitcoin are not only an economic danger, the are even more damaging in relation to the environment.

And in this issue, just about when all articles were written, the Bank of England published a press release on the next steps it intends to take about CBDC, a subject that is exercising many central banks at the moment. Read the press release on page 6. We will hear about the real experience of 'going CBDC', in Lyon, when Derek Rolle of the Central Bank of the Bahamas takes to the stage.

The Editor

INTERGRAF
CURRENCY+IDENTITY

06-08/04/2022
LYON | FRANCE

WE ARE BACK!

Intergraf Currency+Identity will be back in person in April in Lyon, France. Registration to the conference and exhibition has already started, the final touches to the programme have been done and the speakers and panel members have been lined-up and are ready. Join your peers and colleagues face-to-face in Lyon to explore what's new and what's next in currency and identity, or connect online wherever you are if you cannot be onsite this time round.

Although a great opportunity to meet friends and colleagues again, Intergraf Currency+Identity is primarily an important way to catch-up on what has been happening in the two branches of our industry, currency and identity. Since we last met in person, a number of trends have become stronger, while others have receded. Coming out of the Covid pandemic, which is unfortunately not the case in all countries, we will look at what has happened to cash and also - equally thoroughly - in the identity field.

As always, the Conference will start with a plenary session, addressed to both branches of the industry and as we will be in the city where the headquarters of Interpol are located, we will hear from Interpol how the organisation is fighting crime in the area of security documents. In that session there will be two presentations on the identity side, one, introducing the new French ID card and the other a retrospective on the of the 2021 launch of the 'Next Generation US Passport'. For the currency side there will be presentations on the Cash Center and Printworks Project in Egypt and on the fight against banknote counterfeiting in the Philippines.

The highlight of this session, however, will be the Keynote by Nick Jankel entitled 'Leading in and through Crises'. He will explore some of the crises unfolding within our current world, from intense climate change and generational conflicts to the digital revolution, helping us make sense of the many complexities and uncertainties we are facing.

WHAT HAS HAPPENED IN CASH?

Cash for daily use was severely restricted in some countries, with many shops and even local authorities refusing to accept cash, but the number of banknotes in circulation has sharply increased the world over. The famous 'paradox of cash' is one of the most debated subjects in the banknote industry. In a wider context, it affects all parts of the industry from banknote substrate makers up to banknote substrate recyclers. Even cash center operators, ATM operators and commercial banks and of course national and private banknote printers are part of the picture.

The day-to-day use of banknotes, which in many countries should slowly return to pre-Covid levels, encompasses much of which is baffling about the 'paradox of cash'. The opening session of the currency part of the conference is entitled: Post-COVID-19 commerce: impact on the use of cash? Stefan Hardt, Director General of Cash Management of Deutsche Bundesbank, will give the views of the German central bank on how cash demand will change once a new normal really sets in. The views of the Bank of England, the largest European national bank outside the Eurosystem, on this question will be equally important and they will be explained by Nicholas Butt, the BoE's Head of the Future of Money, taking in the future trends, innovation and policy responses.

Issuing currency is one thing, the success of any currency, however, especially in the context of the recent COP26 climate conference, depends on the users to find banknotes practical, attractive and - for an increasing portion of the population - sustainable. Julian Schubert of Koenig & Bauer Banknote Solutions will consider these important banknote qualities and add thus the voice of the technology part of the cash industry to the debate and the Central Reserve of Peru has been invited to talk about the new series of Peruvian Soles banknotes.

Another aspect of cash, at least as important, will

be discussed in the last session 'Access to cash: challenges and new approaches'. Two central bankers, one from the Banque de France and the other from the Banco de España will explain their thinking on the matter. This issue has already come to the fore in several countries and both central bankers will explain how cash will stay accessible in their country for those people who rely on it.

In the currency area we can see that CBDC - Central Bank Digital Currency - has left the talking phase and is heading towards serious trials. The evolution and revolution of Central Bank Digital Currency is the title of the penultimate session of the day on the currency side. Jürgen Schaaf, Adviser to the Senior Management of Market Infrastructure and Payments of the European Central Bank has been invited to talk about the digital Euro. The digital Euro so far is only a work in progress, not yet a reality. But the President of the European Central Bank, Christine Lagarde said last year: "My hunch is that it [CBDC] will come. If it's cheaper, faster, more secure for the users then we should explore it. If it's going to contribute to a better monetary sovereignty, a better autonomy for the Euro area, I think we should explore it." The EU is one of the 'heavies' and the Euro is the currency of 19 EU countries and over 340 million Europeans, so a digital Euro would make a big difference. China is another big economy that is getting very close to issuing a Central Bank Digital Currency. But it is one of the nimble minnows that came first in the race to launch CBDC.

Derek Rolle, the Deputy Governor of the Central Bank of The Bahamas, is one of the few people who can talk from experience about Central Bank Digital Currency, as his country introduced the digital currency, called the 'Sand Dollar', in October last year. Mr. Rolle will therefore be able to talk about a reality, rather than a project perhaps under consideration.

Another subject that will be intensively discussed is Currency Management, for which speakers from the US Bureau of Engraving and Printing and the Saudi Arabian Monetary Authority have been invited.

LOOKING AT IDENTITY

The Identity part of the conference will start with a session entitled 'How did the pandemic change the identity and travel continuum' offering a report on the disruptive impact of COVID-related documentation at the Canadian border and a panel discussing the 'latest on vaccination certificates' moderated by Uwe Seidel of the Federal Criminal Police Office (BKA) in Germany.

The German experience will again be shown in the next session, entitled ' Old dog - New tricks: new security features and new forms of identification' when 'Smart eID - The digital ID for Germany' will be presented, as will new the new Austrian national ID card.

The next session will be concerned with the balance or the coexistence between physical and electronic identity documents, with a presentation by the US Department of Homeland Security, Customs and Border Protection while a presentation by Thales will alert the audience to the latest advances in securing the microcontroller and its embedded software against fraud.

The two last sessions on the identity side will explore digital travel credentials and a contribution by SICPA will question if 'frictionless travel in digital times is a real possibility or a pipedream'. It will look at two approaches: Digital Travel Credentials (DTC) and Self-Sovereign Identity (SSI) while the following presentation by Fabrica Nacional de Moneda y Timbre - Real Casa de la Moneda (FNMT-RCM) will look at an identity model based on decentralized verifiable credentials currently considered by the European Union.

After hearing much about new and non-physical forms of identification we will be updated on the latest in counterfeiting technologies and the need for second-factor authentication by contributions by the Transportation Security Administration (TSA), U.S. Department of Homeland Security, the UK's National Document Fraud Unit (NDFU) and South Africa Printing Works.

The conference will end with a farewell to one of the best-known figures in the industry: Johannes Schäde, who is about to retire from his position as Technical Director of Koenig & Bauer Banknote Solutions. Johannes will share personal insights from over 40 years in the banknote industry.■

Photos: Bureau de Tourisme, Lyon

COLONS, DOLLARS AND BITCOIN?

Three years ago, 'The Economist' wrote that there is little reason to think that cryptocurrencies - in this case Bitcoin - will remain more than an overcomplicated, untrustworthy casino gamble. Although the underlying problems have not changed, now Bitcoin has been elevated to a legal tender currency. History will tell in time how that experiment went, but the citizens of El Salvador will have to live with the real consequences now.

Not so lang ago, one thing most political and economic observers agreed about, was that the cryptocurrency Bitcoin would never be a national currency, mainly because it fluctuates too wildly. Well, on September 7, it became just that in El Salvador. Here it shares the honour of being the nation's currency with the US Dollar. El Salvador's last 'indigenous' currency, the Salvadorian Colon, was abolished in 2001, and although, no longer in existence, the Colon has not officially ceased to be legal tender.

The Bitcoin Law was passed in record time on June 8th, 2021 by the Legislative Assembly of El Salvador, after being proposed by President Nayib Bukele, who managed to get a super majority for the move. This gave Bitcoin the status of legal tender within El Salvador after September 7th, 2021, requiring businesses by law to accept Bitcoin for all payments. However, on the day, the citizens of the country did not seem very enthusiastic.

SALVATION IN A WALLET?

The *New York Times* wrote that Mr. Bukele, a tech-savvy millennial, had pitched the Bitcoin adoption as a way of bringing more Salvadorans, about 70 per cent of whom don't have bank accounts, into the formal economy. Using the cryptocurrency would make it faster and cheaper to get remittances from abroad, he argued, claiming that it would help Salvadorans save about $400 million (€338 million) which is spent annually on commissions for remittances, while giving access to financial services to the unbanked. He said that it could also free the indebted nation from the hold of the traditional global financial system. But turning against the global financial system may be a very dangerous move. The World Bank and the International Monetary Fund (IMF) are already reluctant to supply further funding because of the Bitcoin Law and the move has reduced the chances for El Salvador's request for more than $1 billion (€843.8 million) in financing from the IMF. The international bond market was similarly skeptical. El Salvador's sovereign debt dropped almost five cents in a single day, ending September 7 trading at 87.6 cents on the dollar.

A LESS THAN FLAWLESS INTRODUCTION

The US magazine '*Foreign Policy*' wrote that Bukele also announced an official Bitcoin wallet, Chivo - Salvadoran slang for "cool". It would work like PayPal; you would have a balance in dollars and a balance in Bitcoins, held at Chivo. New users would get a signup bonus of $30 in Bitcoin, a present from the gracious government. 200 Chivo ATMs were installed and 50 staffed Chivo kiosks were constructed around the country before September 7.

Chivo launched just after midnight on September 7. The system started failing three hours later. Server capacity was increased and app installations were not re-enabled until 11:30. Transactions failed through the day; customer service lines were jammed; Chivo ATMs ran out of cash. Shortly after 10:00, the price of bitcoin crashed by $10,000 in three minutes. Chivo users watched their $30 in bitcoin drop below $25 in real time - a strong practical education in Bitcoin's volatility, the *NYT* wrote. Bukele blamed the crash on the International Monetary Fund, though it was more likely due to leaked news of crypto exchange Coinbase receiving a warning from the US Securities and Exchange Commission. Bukele had purchased $20.6 million in bitcoins for the national treasury the day before.

In the streets, the introduction of Bitcoin did not go well either. Traders were reluctant to accept Bitcoin. "I'd rather lose the sale," one trader told *La Prensa Grafica*. Others didn't trust money they couldn't hold in their hands. Street vendors and their customers may not even have phones. Many of their customers are illiterate. Some government offices didn't accept Bitcoin payments. Transfers from Chivo to bank accounts were not reliable. The Chivo ATMs didn't work well - one machine only had a reported three successful cash withdrawals in a day. Even transfer of Bitcoins in and out of Chivo had problems. Tweets from @chivowallet gathered aggrieved responses from people.

Even eight days later, on the nation's bicentennial, anti-government marchers in San Salvador took to the streets to protest the adoption of Bitcoin as legal tender and recent moves by President Bukele to consolidate power. They carried signs declaring "no to dictatorship" and "we were defrauded by Bitcoin" *Bloomberg* wrote.

Bukele is pressing ahead with the Chivo project—his plans need those remittance dollars, and he still hopes for an influx of foreign Bitcoins. Fears of criminals bringing in dirty Bitcoins and exchanging them for clean dollars, draining the $150 million trust that was set up as a buffer between Bitcoins and dollars, have not come to pass—because Chivo doesn't work well enough.

It's not clear if or when the Chivo network will be

fully functional. The identity verification system simply doesn't work and has left behind a huge mess to clean up. Chivo customer service staff are being funded on a month-to-month basis.

Bukele sees Bitcoin as one way to save the countries financial problems. *'Foreign Policy'* writes that as El Salvador's currency is the US dollar, Bukele can't print money; so he needs to borrow - or use the Bitcoin Law to skim the remittances sent from abroad. A quarter of Salvadoran citizens live in the United States and send money home; remittances were over $5.6 billion in 2019, on the level of El Salvador's total export income and accounting for up to a fifth of the country's GDP. After fees, these dollars go to the recipients. That's the money that the government - and its Bitcoin partners - are after. Logically, the Chivo app is available internationally for remittances - dollars go into Chivo, the government subsidizes transmission costs and keeps the actual dollars, and the recipient gets virtual "Dollars" that are numbers displayed in the Chivo app.

"Bitcoin was a very big economic decision, and it was done totally illogically, sent to congress and passed the same day," opposition lawmaker Claudia Ortiz said in an interview with *Bloomberg,* adding it was unclear who was behind the vandalism. "We are going through a profound fiscal crisis with high cost of living and unemployment and the government's response, instead of serious economic policy, is to adopt Bitcoin as legal tender."

The 40-year-old president is popular with the public but has been accused of eroding democracy, including by the administration of US President Joe Biden. In barely two years in office, Bukele has taken control of almost all levers of power. Recently, top judges appointed by his lawmakers ruled he could serve a second term, *Euronews* writes. The weekly *The Economist* warned that beyond the Bitcoin tech-bro hype is an old-fashioned caudillo, as there have been many before him.

Bukele has also promised to clean up graft, but the US recently put some of his close allies on a corruption blacklist, including the president's chief of staff, Carolina Recinos, who is on the US State Department's Engel List of corrupt officials. She is also a director of Chivo SA de CV, which is a private company, so it is not subject to freedom of information laws as a government department would be, despite being funded with $60 million of public money.

SEVERE CRITICISM OF BITCOIN

David Gerard, the author of the book *Attack of the 50 Foot Blockchain* and the cryptocurrency and blockchain news blog of the same name' wrote in *Foreign Policy* (September 17) that the Bitcoin introduction will likely be a disaster for the country - but it's typical of Bukele's erratic style of government. It's also typical of Bitcoin fantasies; a project completely unsuited to daily life in El Salvador, set up largely to boost the image of the cryptocurrency itself.

Bitcoin is the first cryptocurrency, originally created to be a form of money outside government control, so it is ironic that in El Salvador it is tool of a government. Bitcoin has utterly failed to be useful as currency - except for ransomware payments - so the promotional line is now that it's a "store of value," Gerard wrote. That is quite a claim for a speculative commodity given to spectacular asset bubbles, whose price can go up and down 50 per cent within a couple of months. ■

The BoE's plans for CBDC

HM Treasury (HMT) and the Bank of England have announced the next steps on the exploration of a UK Central Bank Digital Currency (CBDC), which would exist alongside cash and bank deposits, rather than replacing them.

In 2022, HMT and the Bank will launch a consultation which will set out their assessment of the case for a UK CBDC, including the merits of further work to develop an operational and technology model for a UK CBDC. It will evaluate the main issues at hand, consider the high level design features, possible benefits and implications for users and businesses, and considerations for further work. This consultation will form part of a 'research and exploration' phase and helps to inform policy development over the next few years.

No decision has been made on whether to introduce a CBDC in the UK, which would be a major national infrastructure project. In April 2021, the Bank and HMT initiated the joint CBDC Taskforce to coordinate the exploration of a potential UK CBDC. The Bank also set up the Engagement and Technology forums, where relevant stakeholders from industry, civil society and academia provide strategic and technical input to the work on CBDC. The 2022 consultation will inform a decision on whether the authorities are content to move into a 'development' phase which will span several years. A technical specification would follow the consultation explaining the proposed conceptual architecture for any CBDC. This could involve in-depth testing of the optimal design for, and feasibility of, a UK CBDC.

If the results of this 'development' phase conclude that the case for CBDC is made, and that it is operationally and technologically robust, then the earliest date for launch of a UK CBDC would be in the second half of the decade.■

DIRTY (PSEUDO) MONEY

Bitcoin has had mixed fortunes lately, with becoming an official currency in one country - El Salvador - and being banned completely in another, China. While the environmental consequences in Central America may be negligible, in China they are considerable.

While bitcoin had an euphoric moment on July 7th and September 7th in El Salvador, when the crypto currency became one of the country's official currencies, alongside the US$, there was a definite deflationary moment a little over two weeks later, when the People's Bank of China (PBoC) banned banks and other financial institutions from offering services related to crypto, including transactions of fiat to crypto currencies, or from one crypto to another. Anyone facilitating trades is subject to legal prosecution, including those individuals who live inside China but work for offshore crypto exchanges that provide service to China.

The reason for the Chinese ban are not quite clear. It could be, as 'Reuters' wrote on September 24, that governments from Asia to the United States fret that privately operated highly volatile digital currencies could undermine their control of the financial and monetary systems, increase systemic risk, promote financial crime and hurt investors. Chinese government agencies have repeatedly raised concerns that cryptocurrency speculation could disrupt the country's economic and financial order, one of Beijing's top priorities. Analysts say China also sees cryptocurrencies as a threat to its sovereign digital-yuan, which is at an advanced pilot stage. China's National Development and Reform Commission said it will work to cut off financial support and electricity supply for mining, which it said spawns risks and hampers carbon neutrality goals.

The enormous electricity consumption of Bitcoin mining operations is indeed a great worry not only for China, but for all countries, where Bitcoin is mined. In August and September, China faced a severe power crisis that affected commodities from aluminum to steel, and several industries have seen their power supplies curbed in the last few weeks. Until the crackdown the country was home to a large concentration of the world's crypto miners and as recently as April had a 46 per cent share of the global hash rate, a measure of computing power used in mining and processing, according to the Cambridge Bitcoin Electricity Consumption Index. In contrast, the US accounted for 16.8 per cent of the world's crypto mining during that same month.

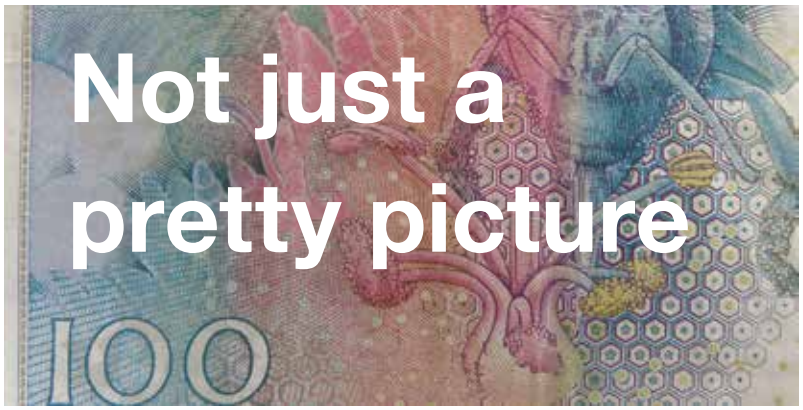
The exodus may well be permanent. Coindesk, cryptocurrencies' home journal, wrote on September 28 that one of the world's largest manufacturers of Bitcoin mining machines, Bitmain, is planning to suspend sales of its machines to miners in mainland China and is moving most of its production out of Shenzhen into other countries. Another sign that China was serious was, that days after the announcement, authorities in the province of Inner Mongolia seized over 10,000 powerful, specialized machines for Bitcoin mining.

The link between the forced exodus of the Bitcoin mining industry and the environment is also explained by the fact that many of the Bitcoin miners went to Texas where they found the two things the Bitcoin industry needs: cheap electricity and a relaxed regulatory environment.

The BBC writes that Texas has some of the cheapest energy prices in the world, due to its deregulated power grid. But some analysts warn that the "Great Mining Migration" may lead to serious repercussions, as cities and towns struggle to meet the huge energy appetite of the crypto miners. In February, blackouts following a deadly snowstorm, left millions of homes and businesses in Texas without power for days. More than 200 people died. During the power outage, Bitcoin farms were compensated to stay offline.

Their application-specific integrated circuits (ASIC) machines are barebones computers with multiple graphics cards, or GPUs, instead of the single-card standard, which on mining rigs work 24 hours a day. Crypto mining businesses can have hundreds or even thousands of rigs in one location. A mining center in Kazakhstan runs 50,000 mining rigs, which also generate heat, requiring extensive cooling, which in turn requires more electricity. According to a report by CNBC, Bitcoin mining accounts for about 35.95 million tons of carbon dioxide emissions each year - about the same amount as New Zealand.

In an opinion piece in *The New Yorker*, Elizabeth Kolbert wrote in April, that Bitcoin mining is, of course, purely metaphorical, but the results can be every bit as destructive as with the real thing. According to the Cambridge Bitcoin Electricity Consumption Index, Bitcoin-mining operations worldwide now use energy at the rate of nearly a hundred and twenty terawatt-hours per year. This is about the annual domestic electricity consumption of Sweden. According to Digiconomist, a single Bitcoin transaction uses the same amount of power that the average American household consumes in a month, and is responsible for roughly a million times more carbon emissions than a single Visa transaction. At a time when the world desperately needs to cut carbon emissions, does it make sense to be devoting a Sweden's worth of electricity to a virtual currency? The answer would seem, pretty clearly, to be no. And, yet, here we are.■



Not just a pretty picture

In the battle between tradition and convenience, or banknotes and electronic payments, it is often overlooked that banknotes convey many messages, far exceeding their payment function alone.

It is quite possible or, indeed, it may be quite probable, that tourists arrive in a country, staying a few days, looking at tourist sites, having meals in restaurants and drinks in bars without ever encountering a single banknote of that country. As they have presumably come to learn something about their temporary host country, they are missing something.

For most National Central Banks, banknotes are not only means of payments. They are subtle ways of introducing a country to the world and of reminding its citizens of their history and of their standing among other nations. Often that is done by showing portraits of famous people, kings and queens, presidents etc. In the past this was almost universally so, but in recent decades, banknotes have become more diverse, beautiful and interesting.

There are still exceptions. The most powerful and most widely used currency in the world, the US $, persists in showing a portrait of a president or founding father printed in black and either an official building or a historic scene on the back printed in green - hence the popular nickname, greenback. The - all male - worthies escaped their small oval vignettes only in the 21st century and by 2009 even George Washington's on the $1 note had become bigger and he looked a little less glum. But meanwhile Abraham Lincoln on the $5 had become totally freestanding in 2009, his head was even partially surrounded by a circle of stars, a little like a halo. In the same year, Benjamin Franklin on the $100 received a total makeover with a much larger free-standing portrait, a golden writing quill and an inkpot that also displayed the liberty bell. The $100 was also the first US banknote to have a security stripe.

Who appears on which US denomination is another curiosity. The founding US President, George Washington, graces the note with the lowest value, the $1, while Benjamin Franklin on the $ 100 was 'only' one of the founding fathers. Under the last but one US President, Barak Obama, there were plans to push Andrew Jackson, who tried to ethnically cleanse the south-eastern USA of its indigenous inhabitants, off the $20 note and replace him with Harriet Tubman, a black woman and a hero of the liberation of slaves in the 19th century. When Donald Trump was elected President in 2016, the plan was quickly quashed. On the whole, the US currency throughout the ages has not been a great source of inspiration to banknote designers, but the raw economic power of the Dollar probably made any aesthetic considerations irrelevant.

It looks as if large nations or large economic groupings with a common currency have the least visually inspiring banknotes. The second largest reserve currency, after the US$, the Euro, may not be compared to the camel that is a horse which was designed by a committee, as the old joke has it, but it was certainly selected by a committee with the aim of creating a banknote look that conveyed dependability, stability and seriousness.

The restraints on the designers were formidable. The Euro at the time of its creation, existed only in electronic form, and to decide on the look of the physical currency, a design competition was held. There were two categories, 'ages and styles of Europe' and 'abstract/modern'. For the categories, designer from all over Europe chose well -known and well-liked historical portraits, sculptures and buildings, but as all of them were based on localities or nations, choosing one of them would favour one nation or culture over all the others. The winner was the Austrian designer Robert Kalina with a series of bridges and gates form the gothic to the modern period, which, although still showing some reference to actual brides and gateways, could be anonymised or made generic enough not to offend anyone in the Euro nations. A second series (2013 to 2019) slightly modified the design without changing the principal images. Looking at the works submitted to the Euro design competition (www.ecb.europa.eu/pub/pdf/other/euro_catalogueen.pdf) shows that there were many good ideas but most used images that were tied to a specific location, culture or nationality.

SMALL AND BEAUTIFUL

The creators of the most interesting banknotes, usually in or for small countries, do not have these restraints. A look at the 'Banknote of the Year' competition, organized by the International Banknote Society, shows the amazing creativity of banknote designers and the foresight of Central

Banks to transpose the creative ideas into reality.

This year the Banknote of the Year was the 100 Peso note from Mexico which shows an image of the nun Sor Juana Inés de la Cruz, the most important poet/writer of 'novo Hispanic' literature in the 17th century. She is shown against a section of the main patio of the Antiguo Colegio de San Ildefonso, in Mexico City's historic center, which was a centre of education in New Spain - Mexico today.

On the reverse side of the vertical polymer note is an image of the Monarch Butterfly Biosphere Reserve, where, not far from Mexico City, millions of Monarch butterflies gather to spend the winter. In its comments, the IBNS wrote "Mexico's award-winning entry may provide a template as other countries reconsider how they design and promote new banknotes. The successful design in eye-pleasing red combines Hispanic architecture, a famous female Hispanic literary figure and a tribute to the world's fragile ecosystem." The IBNS continues that Banco de Mexico was both the printer and issuer of this award-winning design banknote, which is part of the bank's current G Series introduced in 2018. Produced by the Banco de Mexico's new printing complex located in Jalisco, which began operation just before the coronavirus pandemic, the banknote has significantly improved security features which coordinate the transition to a polymer substrate.

VISUAL EXUBERANCE AND RESTRAINT ?

At Intergraf's last - virtual - Currency+Identity Conference in April 2021, another IBNS lauded banknote of a small country was featured. The 2014 Trinidad & Tobago 50 Dollar note, which became the IBNS banknote of the year for 2014, was shown by Ms. Sharon Villafana, of the Trinidad and Tobago Central Bank as the first in a totally redesigned series. As a polymer horizontal note, it was generally acknowledged as being very beautiful, but the public did not accept it as a means of payments, only as a kind of keepsake. The banking industry as well had problems with processing polymer substrate with a window, and only two commercial banks agreed to use the note in ATMs. Beauty alone does not seem enough for the public, utility also counts for something.

SOFT IMAGES FOR A HARD CLIMATE

In the past, banknote design and printing relied heavily on the intaglio process, a hard-edge line process. Later offset printing was added, expanding the artistic and technical possibilities, so far 'soft' artistic mediums such as water colour were absent. That changed at the turn of the last century, when the Faeroe islands introduced a series of Kronur banknotes that were largely based on water coulour paintings. The notes are unusually good at depicting the harsh and stormy climate of the islands in the North Atlantic and they also draw attention to the fauna to be found there, birds, fish and shellfish, which however, are depicted in meticulous intaglio.

Banknote collectors care little about the numbers on the banknote indicating the value. They care more about the design, the historical background and the image of the country the note is trying to convey, all things utterly lost in electronic payment systems. Perhaps, by talking and writing about this, we could awaken interst in our and other country's banknotes for the next generation.■

HOW YOUNG PEOPLE SEE CASH

Many young people in the 'developed world' hardly ever encounter cash. Two projects at an art school in the USA asked students to forget about their cards and think about banknotes. One project lead to a beautiful series of banknotes that could pique the interest of young people, and another, aimed at the future 10 to 20 years from now, imagined banknotes with an electronic functionality.

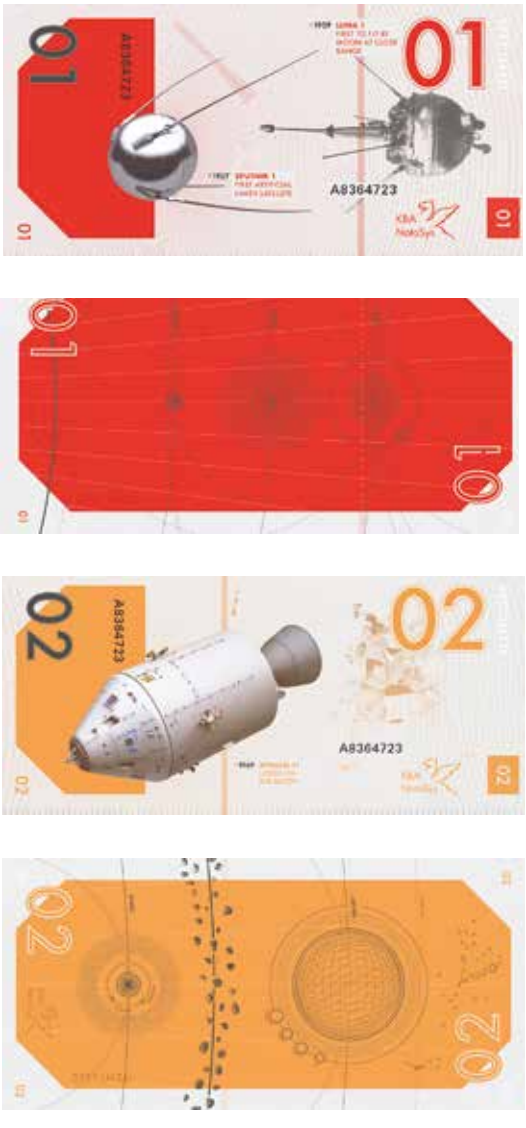
For banknotes to remain relevant, they have to function primarily as a means of payment - or medium of exchange - and of course, as well as store of wealth and unit of account. But banknotes have another function as well. They are a kind of calling card for a country - or in the case of the Euro, for a group of counties. When thinking about the design of banknotes, this aspect is important: what kind of image of their country do banknotes present to the outside world? This message has been understood by most dictatorial regimes, but how to visualize it an open, democratic society? Many countries refer to their history, usually by portraing important personalities, buildings or places. One country that used such storytelling superbly was Switzerland with its last series of Swiss Francs and the overall title of 'Switzerland - open to the world' and denomination-specific subjects such as time, light, wind, water, etc.

Present or future banknote designers have to include not only these 'philosophical' questions but all aspects of the life of banknotes in their considerations. Doing so in close contact with the industry that produces banknotes is a definite bonus. One US art school, the ArtCenter College of Design in Pasadena, California, offers its students close contacts and cooperation with industry in one of the College's 'Sponsored Studios', 14-week studio courses where either individually or as part of a team, students present their design concepts to experienced professionals who, in turn, provide critique, insights and guidance alongside ArtCenter faculty throughout the project.

One project, in 2017, was sponsored by Koenig & Bauer Banknote Solutions (formerly KBA-NotaSys) and lead by Hervé Guillerey, the company's head of banknote innovation and design services. He is constantly looking for new ideas to keep cash users engaged, and oversees research and development for the innovation and design of banknotes. And as part of his quest to maintain banknote relevance, Guillerey has spearheaded two 14-week Sponsored Studios at the College.

In this first project, participating students were asked to create a family of five banknotes, front and back, with a strongly connected narrative throughout the banknote series. They also had to consider printing constraints and security features, but did not need to think of a country or specific area.

The result was a winning project on space exploration, called the Laika Project Phase 1, in honour of the first mammal in space, the Russian dog Laika.



The Laika Project Phase 1series by Chase Morrison

"When you put the banknotes together, you saw the entire solar system. It wasn't anything anyone had ever done before," Guillerey said. The designer, Chase Morrison said that "the topic of Space Exploration is universal in nature, fits on a timeline, and promotes the ingenuity of humanity. It could also remind us to keep looking up."

The series of five specimen notes tells the story of the 20th and 21st century space exploration with the first object in space, the Soviet space probe Sputnik in 1957 followed by Luna 1, which performed the first fly-by at the moon at close range. Space exploration at the end of the 20th century was a high-pressure game between the USA and the then USSR, with the first components of the International Space Station put into orbit in 1958, followed by the Apollo II landing on the moon in 1969 and Voyager I exploring the outer solar system in 1971. The only 21st century space activity recorded on Chase Morrison's series is the landing of Curiosity Rover on Mars in 2012.

The specimen notes not only show the space vehicles, but on the reverse of the notes, map much of the underlying astronomic systems explaining the significance of the operations.

The series became the basis of a series of specimen banknotes by K&B Banknote Solutions, also called the Laika Series, which was presented in 2021.

When Koenig &Bauer returned to the ArtCenter College of Design in 2019 for another "Banknote Project" Sponsored Studio, the emphasis was again on banknotes, but this time students had to investigate the future of banknotes in 15 to 20 years from now from the point of view of the millennial generation.

BANKNOTES PLUS ELECTRONICS?

Sina Grebrodt and Madison Bucher, who had the idea of creating banknotes that can be activated and deactivated using a smartphone app, made the winning project. In their research leading up to the idea, they and other student teams had to look at how cash is used in common everyday interactions and if there were positive and negative points about this. One important question was, why people were no longer carrying cash. They began to analyze the pain points of using cash, noticing that organizing the bills, retrieving them from a wallet to pay and then putting them back in a wallet, were time consuming and unpleasurable experiences. However, they seemed to have overlooked an important negative as well as positive point of using cash: it drastically shows the limit of the spending power of the banknote user when shopping. If one has two $ 20 notes in one's wallet, one cannot spend $ 45, a problem that does not arise with card or other electronic payments, which additionally often have automatic overdraw facilities. But if one has to watch a tight budget, cash is a great help.

The teams also considered the lack of security in banknotes. Lose a credit card and it can be easily replaced and fraudulent use is often refunded. Lose your cash and it's gone for good. They wondered if it were possible to create cash with the same security features as a credit card but was also fun to use. They and all other teams spent weeks observing people holding, storing, playing and paying with cash, imagining different cash-use scenarios and designing prototypes followed by weeks of collaborating closely with K&BBS, getting feedback and receiving technical information to refine the ideas they would present at the end of the project.

"What was most interesting was how the students looked at banknotes as a storytelling opportunity," said Guillerey, adding that the students focused not only on cash and printing cash but looked a broader view of what payment can become. "The students were coming up with entirely new ways of interacting with banknotes."

The winning entry proposed that users would have control over their physical banknotes from printing through purchase. A money clip with a digital interface would allow them to dispense and track their cash. And they could even be rewarded with augmented reality characters when certain transactions were made.

Other projects explored entirely different possibilities for banknotes. A more humanistic approach to cash - emphasizing community engagement and charitable giving - was at the heart of one team's project that utilized cloud computing to automatically funnel money into a cause or need of the user's choice. Another team focused wholly on security, designing banknotes which could be activated or deactivated depending upon the user's scenario. For example, a lost $20 bill could be deactivated, making it invalid.

In commenting on the banknote project at the ArtCenter, the leader of the project, K&B's Hervé Guillerey, said that "the majority of the students, being under 25, at first did not really believe in the future of physical cash and a lot of them thought of going towards a purely digital solution. Fourteen weeks later, at the final presentation, not only did all the projects have a physical base, but most of the students understood why cash is important and were already using it on a more regular basis."

Most people believe that electronic payment methods are more convenient and do not think further about the consequences of not having any physical cash. It is therefore important for all levels of the cash industry but also for government to educate the population on the advantages and the need for the continued use of cash.■

PUTTING LAIKA IN THE PICTURE

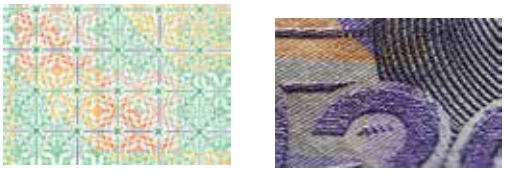
On August 19, Koenig & Bauer Banknote Solutions presented its latest series of specimen banknotes, called the Laika series, which features space exploration since the last decades of the last century until the first decades of the present one.

As far as analogies go, the one chosen by Koenig & Bauer Banknote Solutions for their new series of specimen notes is a clever one. The exploration of space in the late 20th century was an exciting time, when the boundaries of technology were pushed as far as they would go and when new ideas about fundamental issues were found. The Laika series, named after the first animal in space, a cute dog orbiting the earth on board of the Soviet Spacecraft Sputnik 2, is, according to K&BBS, also all about exploration, in terms of design and new technologies and techniques.

While the aims of the space pioneers were to discover the great unknown, those of the designers and technicians at K&BBS were aiming to enable 'efficient production, minimising waste and making machine readability a flawless process'.

When looking at the new Laika series one must not forget that Koenig & Bauer Banknote Solutions builds printing machines and printing lines for banknotes. So, the emphasis is on printing, rather than on security features applied before, during or after printing or especially skilful watermarks. The Laika series is about excellence in printing, and here the full register of dazzling effects is on display.

In offset, microscopic fine lines and microtext are printed flawlessly, intaglio is impressively solid and dense and the same excellence in printing is displayed on banknote paper as on polymer. There is also a metallic hologram and the ability to varnish the notes is also included.



Laika series: detail of offset, intaglio and print on polymer

SUPPORTING YOUNG IDEAS

The series has an interesting history. It is based on a design idea of Chase Morrison, at the time a design student at ArtCenter School of Design in Pasadena, California, USA. During one of the school's 'Sponsored Studios', which enables students close contact with the industries they may be working with in the future, Koenig & Bauer Banknote Solutions sponsored its first 'banknote project', which set the goal of designing a series of specimen banknotes. The winner, Chase Morrison, chose space exploration as his subject (see preceding article). K&BBS loved the design and bought it.

Almost four years later the Laika series was issued after much further development. In a subtle reference to classic banknote portraits, portraits of, e.g. Yuri Gagarin, the first man in space, were added, which also served to show the excellence of intaglio printing. Printed security features were integrated and the complexity of the whole design was increased substantially, but complexity is what printing banknotes is all about. ■

CASH: A ROADMAP TO SUSTAINABILITY

Every human activity has an impact on our environment and on the climate dilemma we are facing. Payment systems are no exception. A new report examines the environmental impact of the cash industry that shows that every link in the cash cycle chain is aware of the problems and is helping to improve the situation.

Just in time for the 26th UN Climate Change Conference (COP 26) in Glasgow in October/ November 2021, business intelligence consultancy Reconnaissance published the report 'Cash: A Roadmap to Sustainability'. It looks at the efforts of individual companies, private and government owned, and organizations in the cash industry to be 'good citizens' and it has many improvements to report, from small to large ones.

Despite digitalisation, cash is, and will remain, a key component of the payments eco-system, itself a driver of economic activity as well as social inclusion. But in addition to being a key and universal tool for payments, cash needs – along with all other components of modern life – to be sustainable as well, the editor of the report, John Winchcombe writes in the foreword.

The report examined the efforts of over 30 businesses, central banks, mints and state printing works around the world and drew from 106 case studies from 24 organisations. The case studies detail the steps they have already taken to reduce the environmental impact of their part of the cycle, not vague promises for the future.

Some changes were entirely within the control of the organisation while others required co-operation with others. Some involved changes to materials, needing extensive trials. Others required process changes and others still, for staff to work differently. Some were corporate decisions, others were implementing staff suggestions. Across the cash cycle, there are examples of what can be done for every size of organisation. The paper tells the story of an industry not driven by legislation or customer tender requirements, but by the wish to do the right thing for the right reasons. It is a story of what is possible and offers hope for the future and an important record of progress made in making cash more environmentally sustainable.

The report is less about how large the impact of cash on the environment is relative to non-cash payments, but to acknowledge that cash has an impact and what is being done to reduce it. Importantly, the report thus puts the role of the cash industry relative to the environmental dangers we are all facing into perspective.

The environmental impact of payments is generally small compared to all other goods, services and other sources of emissions. And the physical nature of cash has a different environmental impact than other payment types, as it helps provide contingency and resilience for the overall payments landscape.

This does not mean that the non-cash payment industry's role in our environmental system is ignored. While the carbon footprint of digital payments is hard to quantify, it does require substantial hardware, software and considerable energy consumption for payment data processing, data management and communications whether at the point of sale, on the internet or paying using mobiles. This means that digital payments are not as digital as they claim and going totally digital would not be a solution to our environmental and climate problems.

The most comprehensive research about the environmental impact of payments remains a paper published by the Dutch National Bank in 2018. It showed that each cash transaction created 4.6g of CO_2e. When we consider that a transaction based on distributed ledger technology such as Bitcoin uses about 279g CO_2e on average, perhaps the figure for cash is not such a big number. Since the Dutch paper was published, the number of Dutch ATMs has fallen by 56 per cent and the number of cash transactions by 74 per cent. Such big changes will have reduced cash's carbon footprint significantly.

WHAT HAS BEEN AND IS BEING DONE?

Every contributor to this report, however they interact with the life of cash, has demonstrated an awareness of the need to act responsibly, a willingness to change and hard evidence of the improvement they have achieved. The companies are doing much more than just adhere to ISO 140001 and 50001 and sourcing green energy, important though these are. They are taking action, devoting time and resources and investing to do better. Many projects have been initiated from the bottom up within the organisations.

To give some examples: Seven organisations invested in solar, hydro, wind or tidal power, 10 organisations are sourcing 100 per cent renewable energy. 23 UK organisations are actively working together as part of a charter to achieve net zero emissions and reduce plastics. Producers have signed up to an industry sustainability charter. Polymer end of life recycling is offered to customers as a service. Cash-in-transit companies invested in telematics and routing optimisation to reduce fossil fuel usage, and are trialling or deploying electric or hybrid vehicles.

Here is another example from the user side of the industry: In September 2020 the UK's NatWest Bank brought together organisations from across the UK cash cycle to work together to reduce the environmental impact of cash. They proposed a Cash Industry Environment Charter with commitments, targets and a road map of change and this was signed in January 2021. Eight organisations signed the Charter and a further 14 organisations are members of the group.

To avoid green washing, the report focuses on progress made and delivered rather than future promises. But it also sets a course for the future for an industry that is ambitious to address its environmental challenges. There is no shortage of plans and future actions. By listing achievements, the report is able to share best practice with the global cash industry of what is possible, and to demonstrate to readers that the industry is listening, acting and making a real difference. ■

A VIEW FROM DELFT ON THE FUTURE OF CASH

Igo Boerrigter, a student at the TU Delft, in the Netherlands, was commissioned by De Nederlandsche Bank (DNB), to analyse the current use of cash. Based on his analysis he made recommendations for a sustainable, usable and affordable cash system for the future.

His graduation assignment at the Dutch central bank seemed fairly straightforward: research and analyse cash as a use-product. What can be improved, from a user perspective? What is the future of cash?

When interviewing people who just paid at shops, he discovered a generational gap in the perception of money. Older people largely see cash as the foundation of their finances, and the numbers they see on their bank account as buffer. Younger people, see their 'digital money' as their baseline, and cash as 'extra money'. Increasingly user-friendly apps and payment systems also appear to change the notion of cash giving you a better insight into your personal finances and stimulating better budgeting. Because of these developments in ease-of-use, the shift from cash to digital payments has dramatically increased in pace.

In the Netherlands, shops, but also some government services, are increasingly no longer accepting cash. The shrinking size of the cash economy is driving up the costs for the remaining users. Last year, Dutch banks announced they will start working together in the shared 'Geldmaat' ATM machine, reducing the costs of maintaining their own ATM networks.

Research at the Dutch central bank showed that this trend is expected to continue. Eventually, we'll reach a point where usage of cash has decreased by so much, that maintaining the infrastructure for cash distribution and the ATM network will no longer be possible. Cash will disappear. In other words: cash will soon become too expensive. This could cause significant problems for the vulnerable groups in our society for whom digitisation is moving too fast: the elderly, low literate and cognitively disabled. Another set of risks relate to large-scale crises, such as flooding, when the economy cannot fall back on cash money as means of transaction. Lastly, it would mean losing the tool that allows people to own and control their own money independently of commercial banks.

BRINGING THE FUTURE CLOSER

"We've got three possible future scenario's ahead of us", Igo says. "Option one: we do nothing and let cash money 'crash'. If the government doesn't take action, cash will automatically reach a critical lower limit and simply disappear. People dependent on cash money transactions could get hit hard by this, they won't be able to buy their groceries." He continues: "The second option is that, in spite all our analysis and predictions, cash usage does not decrease further. This is more wishful thinking than an actual basis for a strategy. Finally, our best case scenario is that we design a smaller, but much more efficient system to allow cash to continue to exist. This will smoothen the transition to the inevitable full digitisation of money transactions while maintaining a cash system that can function on low use."

According to Igo, the latter requires banknotes to remain in circulation longer between shopkeeper and consumer. "In Switzerland, you have an app that facilitates cash withdrawals at shops. You indicate how much cash you want, and the app tells you at which shop you can pick it up. This eliminates the need for ATMs. It would mean, however, that shops have to check for counterfeit notes themselves, because notes will no longer pass through the Dutch Central Bank or central cash centres.

CASH FOR EMERGENCIES

Letting the roles that cash play die out completely also carries large risks, especially in the case of large-scale calamities, when there is no fall-back payment system. This is why he advocates for the government to make sure alternative payment methods are available. For disruptions with a limited duration, other digital systems are an alternative. "For major crisis situations, such as floods or structural problems in the ICT infrastructure, the government will have to draw up an emergency plan, because if the entire digital infrastructure is out of use, then probably the only solution is that the government 'advances' cash to citizens." ■

SECURITY FEATURES THAT TELL A STORY

The use of distinctive optical security features in polycarbonate passport data pages, identity cards and other identity documents has long become commonplace. But these features were mostly hidden to the casual observer and part of a separate design level. Recent developments by several specialist companies have put the protection of ID documents from casual and professional fraud firmly into the realm of the all-over design of the document, while simultaneously strengthen the fraud protection function.

The Covid-19 epidemic has not only changed our daily life, making us less busy, consuming less and making us more 'housebound' - global passenger air travel declined from a peak of 100 per cent in 2019 to 52 percent in April 2021 (IATA Economics), with an increase expected to top 105 percent in 2023 - it also proved a golden opportunity for document forgers. Frontex reported 16 000 cases of document fraud from 2020 to 2021 at EU and Schengen borders, US Customs and Border Protection (CBP) in July 2020 seized several shipments of 20 000 forged drivers licenses, there were 1 387 615 reported cases of ID theft in USA in 2020 (up 113%) (CSN, 2021), one in ten online verifications in the USA are fraudulent (Veriff, Fraud Report, 2020) and 23 per cent of fraud cases make use of fraudulent documents (Veriff, Fraud Report, 2020). These figures were quoted by John Peters of OVD Kinegram at "Identity Week" in London in September.

He also pointed out that when the EU Council publicized its 10 priorities in the fight against crime, it stated that "in addition to these priorities, the production and provision of fraudulent and false documents will be addressed as a common horizontal goal, since it is a key enabler for many crimes".

One EU Agency closely concerned with document fraud is Frontex, the EU border agency. In a project called 'Document Challenge II', the agency found that humans were 65 per cent accurate in detecting fraudulent documents, but accuracy declines when there are time restrictions - as there usually are. There is between 29 and 56 per cent agreement between humans and machines, which means neither is perfect. In conclusion, Mr. Peters said, performance depends on intrinsic characteristics, but there is insufficient reference knowledge, and there is still too much non-standard design and technical production. As the Frontex project was first run in 2014, machine performance may have improved somewhat, but forgers' skills may well have kept pace with developments.

THE FIGHT AGAINST DOCUMENT FRAUD IS ON. NOW WHAT ABOUT THE WEAPONS?

Looking at the discrepancy between human and machine inspection results, the design of documents and their security features must take account of human and machine capabilities equally. For humans, design and security features must be intuitive and self-explanatory, while 'the security features offered by the document should be applicable for machine authentication as well' as the ICAO Best Practice Guidelines, 2018 have it. In practice, this means the design should be theme relevant, realistic and easy to understand and be perceptually coherent. The security features should be easy to recognize, but hard to copy, well integrated and interlinked and appeal to the senses look, feel and move. Mr. Peters presented a security feature sample design that hit all the buttons, Kinegram FDP - full data protection. It can be seen again at Currency+Identitiy in Lyon in April.

Kinegram FDP is a single security feature that covers the whole data page or ID card, integrating the printed information of the page or card, the photo, the name and the rest of the personal information with the security effects of the feature. In the sample design, called 'the flight of the bee', the bee is the unifying design element. Several of these insects are shown, in various places, details and positions with colour changes when the card is tilted, e.g. the wings appear to flutter and change colour when the viewing angle is slightly changed.

To do justice to the name of the sample, when the card is tilted left to right, two bees start flying and their paths cross in the middle. The design of this sample is certainly harmonious and self-explanatory and even the untrained eye can immediately understand the elements of it. What is exiting about this feature is that it offers the designer an extremely wide range of possibilities to combine functionality with graphic ideas. The combination of the KINEGRAM's transparent and metallized effects with the background security print improves the security and facilitates easy authentication by desktop readers, smart devices and of course the human eye. The large range of first, second and third level inspection features, including options such as combining transparent and metallized design elements is compatible with most of today's existing manufacturing processes to produce ICAO compatible documents. The feature is completely embedded and can therefore not be manipulated and is additionally protected by the overlaying polycarbonate layer against wear and tear in daily use.■

HOLOGRAPHY: DECEIVING THE EYE

People not working 'in the field' usually come into contact with sophisticated holographic security features only when they glance at their passports or ID cards or banknotes. Such fleeting observation of effects of ten or twenty years ago when compared with what is possible today, shows the great advances the industry has made.

Top left: the banknote holographic stripe, left: the Lyre holographic stripe. Below: the 500 Kr. commemorative coin

Combining physical beauty and security against forgery offers many different avenues. Patches, stripes, full page security features as well as colour changes in images, perceived movements when the object is tilted or the use of UV printing. But for the untrained eye the most baffling feature is the tree-dimensional effect produced in holography. The observer knows the image is flat, but it is difficult to resist the temptation to touch the picture to feel the - non-existent - undulation of the image. The eye does not like to be deceived, but with high-quality holography it is.

One company that excels in this technology is IQ Structures, based in the Czech Republic. It presented its products at Identity Week in London and will do so again at Intergraf's Currency+Identity in Lyon. The amazing and exiting thing about the company's work is the three-dimensionality of the images in a label, banknote stripe or polycarbonate card. A clearly three-dimensional bas-relief seems to float above a colour-changing background, incorporating shapes with again different patterns on seemingly different levels. Some smaller vignettes may incorporate forensic features such as nano-scale inscriptions at a resolution of 254 000 DPI, requiring an optical microscope to read.

For ID cards and passports, IQ Structures produces transparent holograms that stretch right up to the edge of a polycarbonate document, protecting all critical data including the photograph of the holder. This also enables the document designer to visually link several documents, such as passports, ID cards and driving licences with design subjects that are clearly part of a whole, but are individually different.

ID Structures has a large effect gallery which shows every effect available in motion. There are features for the naked eye such as the 'white 3D bas-relief effect', which, rather than being just white, plays on the brilliance of silver metallic imagery, rainbow 3D effects that play rainbow colours over the metal effect when moved, the keyhole effect, a achromatic 3D frame effect that shows a larger full 3D object through a smaller viewing window or moving effects, kinetic effects that can provide a moving background to white 3D bas-reliefs and a semi-transparent 3D bas relief effect.

The holographic security features can be used in passports, ID cards, tax stamps, etc.as well as on banknotes. Any effect in IQ Structures effect gallery can be combines with any other. ID Structures said it also offers a quick, flexible and cost-effective mastering process, as it has all the necessary technologies inhouse.

The company even produced a hologram for the Czech National Bank's CZK 500 commemorative silver coin, released in June 2021, featuring a famous steam engine, the Škoda 498 Albatros steam locomotive.

"Our team has been working on the development since 2018 together with the Czech Mint. We wanted to perfectly print a simple holographic motifs, but also advanced and unique optical effects. One of them, for example, is the so-called Full 3D effect applied in the area of the tunnel from which the locomotive emerges. This effect allows us to create the spatial illusion of a sparks flying from the engine, seemingly below the plane of a coin," says Robert Dvorák, Business Development Director at IQ Structures. ■

ETIAS - WELCOME, BUT WITH CAUTION

Although currently somewhat subdued, international travel is an important part of many countries' economy. It is also culturally enrichened. The question is how to keep travelling safe and efficient both for the traveller and for the countries visited. The European Union has followed the USA in developing an electronic system to vet every traveller before coming anywhere near a border: ETIAS

After the pandemic-induced slump in international travel, it is expected that border crossings into the EU will increase strongly in the coming year and the years thereafter, at least to the pre-Covid level. Currently around 1.4 billion people from over 60 countries can visit the European Union without needing a visa and it is only determined after they arrive at the border whether they pose a security, public health, or migratory risk. To allow for that assessment to be done before the travellers start their trip, the European Commission (EC) has come up with a solution - ETIAS, the European Travel Information and Authorisation System - which is expected to come into force on January 1st, 2022, although it will become completely effective and obligatory for travellers only by the end of 2022.

Although ETIAS was designed by the European Commission, it regulates visa waiver status of travellers only for the Schengen area, which is not synonymous with the European Union. Currently, although members of the EU, Bulgaria, Ireland, Romania, Croatia and Cyprus are not part of the Schengen area. Bulgaria, Romania and Croatia are expected to join soon, but the situation in Cyprus is complicated by the unresolved status of the northern part of Cyprus, which is under the control of Turkey. However, some countries that are not members of the EU, such as Iceland, Norway and Switzerland, are also part of the Schengen area and thus subject to the ETIAS regulations.

The EU will not be the first to introduce such system: for many years now, visa-exempt travellers have had to apply for a travel authorisation to enter the US, Canada or Australia. In the US, the system is called ESTA, the Electronic System for Travel Authorization.

THE PRACTICALITIES

ETIAS will only cost €7 for each application for adults over 18 years old, those under 18 will not have to pay any fees. An ETIAS authorisation will be valid for three years for the entire territory of the Schengen area, or until the validity of the travel document the applicant used, expires - whichever comes first.

In most cases, the online application will only take a few minutes to complete. The system will automatically compare the personal data submitted by the applicants with the data already stored in various EU information systems. In case of a 'hit', the application will be manually processed by the ETIAS Central Unit, managed by Frontex, and forwarded to the ETIAS National Units in Member States for final assessment.

AN ORGAINSATIONAL CHALLENGE

The challenges in setting up ETIAS are massive as the system will have to be very secure, not only because it will have to process personal data of the millions of applicants, but it will also need to be connected to a variety of databases such as SIS, VIS, EES, Eurodac and ECRIS-TCN. Currently many of these systems do not 'talk' to each other, so making them interoperable is essential.

Considering the scale and complexity of this project, it is not surprising that 34 institutional actors are closely cooperating to make it happen. These include the European Commission, Frontex which is setting up its Central Unit, eu-LISA which is developing the IT systems, Europol which will provide its own data for the security screening of the application, and the authorities of each of the 30 European countries currently in the process of setting up their ETIAS national units.

FRONTEX RECUITS ETIAS STAFF

In mid-October 41 new staff members joined Frontex to work at the ETIAS Central Unit. They include 28 ETIAS applications handlers, two team leaders, and 11 traveller & carrier support operators, who are currently testing the system developed by eu-LISA.

Once ETIAS becomes operational, they will process and screen applications from visa-exempt travellers who apply for an ETIAS travel authorisation and perform helpdesk assistance functions to support ETIAS applicants and carriers. It is expected that the number of ETIAS Central Unit staff will grow to over 200 in the coming years.

From now on, air and sea carriers as well as international carriers transporting groups over land by coach are able to register both for the Entry/Exit System (EES) and for ETIAS on the eu-LISA website. ■

PASSPORT DATA PAGES: AN ALTERNATIVE

In the realm of travel documents, biometric passports and polycarbonate datapages are the success stories. Particularly with increasing automatisation of border crossings, both are making for efficient operations. But neither are the last words on the subjects. Especially for datapages, a new alternative has appeared.

To make passports more secure against counterfeiting, more usable in an environment that uses machine reading and access gates and more durable to last the validity period - often 10 years - in a reasonable state, issuing countries have adopted different strategies. Among the 199 countries that issue passports, more than 150 have moved to a highly secure electronic passport that uses an inlay to support a microcontroller chip and over 40 have opted for a polycarbonate datapage.

Polycarbonate datapages have been around since 1997, when Finland introduced the first one. It took until the beginning of the electronic passport area in 2005, when Sweden became the first country to issue a passport booklet featuring a PC datapage incorporating a secure microchip, upgrading it from the standard paper-and-laminate datapage.

Upgrading to polycarbonate datapages was in the beginning costly and technically challenging and only relatively rich medium-sized European countries and a few vey technology savvy ones in Asia, such as Singapore and Hong Kong, managed it. When Malaysia became the first country to introduce biometric passports and one of those to convert to polycarbonate the trickle became - almost - a flood. Today, over 40 countries use polycarbonate datapages. Several major passport issuing countries, such as the United Kingdom, the USA, Australia, Bangladesh and Indonesia have recently switched or are about to do so.

Polycarbonate datapages have many advantages, but also a number of drawbacks. The PC datapage is visibly thicker than its paper counterpart, making it more difficult to close the booklet. It makes the passport booklet bulkier and stiffer. This issue is improving but it is still quite apparent on 48+ page passports. As the PC datapage is a stand-alone page and not part of the normal page assembly - where e.g. pages 1 and 2 and 31 and 32 are one sheet - the assembling requires a specific process to make sure the datapage hinge is well aligned with the sewing module.

The PC datapage hinge presents the greatest challenge to ensure a secure connection between the PC datapage and the booklet itself. There are different solutions for this but the datapage with the hinge remains a problem, as it consists of a different substrate with very different properties relative to the visa pages. Lastly, the PC datapage is laser engraved, therefore its use in a passport means replacing the previous inkjet personalization machines. Those machines and their lasers are quite expensive and account for a sizable part of the budget for a PC datapage implementation.

NOT POLYMER OR PAPER BUT PAPER AND POLYMER AND PAPER

There is now an alternative to the traditional paper/laminate and the polycarbonate datapage - Durasave Travel. It was developed by Landqart in Switzerland, the company that developed Durasafe, the paper-polymer-paper composite, which is the substrate of the Swiss currency and that of many other currencies. From the use of cylinder mould watermarks, to the incorporation of security fibres and threads, to iridescent features and special coatings for digital printing, Landqart is able to tailor a solution to the individual requirements of passport-issuing authorities around the world.

This high tech material is physically stronger than traditional paper, is harder to counterfeit, yet retains paper's printability, tactility, and the possibility to use trusted security features such as watermarks and security threads. Proven in the Currency market since 2012, Landqart now introduces this material to the Identity market as a new, sophisticated substrate for passport data pages.

Unique for a paper-type data page, see-through windows can be integrated into the substrate while still being able to be printed like the rest of the book's pages. The paper surface can be personalised with existing inkjet systems, and sewn into the book without the need for a special hinge.

Durasafe TRAVEL is compatible with market-leading holographic laminates. Security foils can also be fully encapsulated by the polymer in the Durasafe structure, while remaining fully visible in reflection and transmission.

In use, the datapage lies flat in the book, but is five times more rigid than traditional paper and has ten times greater folding endurance, ensuring it will last longer in regular use at inspection points and the rigors of international travel. ■

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