

Exchange

THE GLOBAL MAGAZINE OF DE LA RUE



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AUTUMN 2013:

CELEBRATING FIJI'S NATURAL TREASURES

FACES ON BANKNOTES

GLOBAL INTER-OPERABILITY OF ePASSPORTS

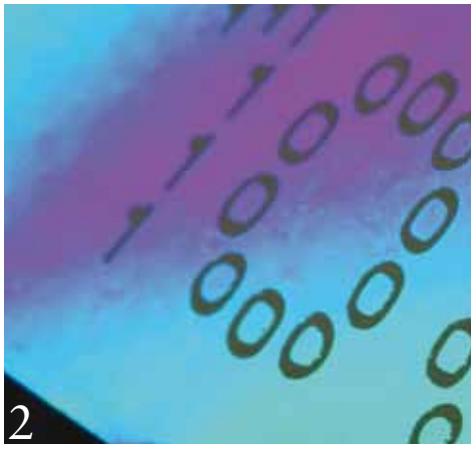
SMART SOLUTIONS TO VISA CHALLENGES

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AUTUMN 2013:

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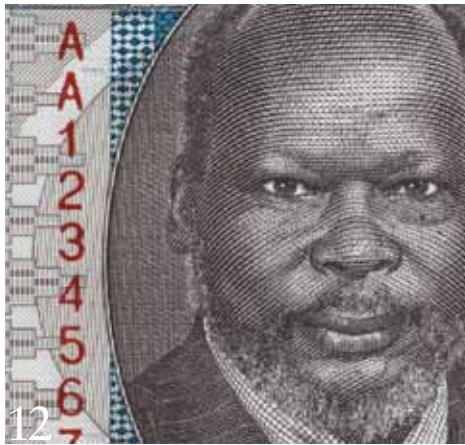
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INNOVATIVE NEW FEATURES FROM DE LA RUE AIMED AT KEEPING THE COUNTERFEITERS AT BAY AND MAINTAINING THE PUBLIC'S CONFIDENCE IN BANKNOTES: TOP RIGHT, SPARK® ORBITAL™, IN WHICH A BRIGHT RING APPEARS TO SLIP AROUND FREELY WITHIN THE PRINT AREA AND UNDER THE EDGES OF THE FEATURE. BOTTOM RIGHT, STARBRIGHT™ COLOUR CHANGING SECURITY THREAD.

Trends in banknote features

Counterfeiting doesn't stand still: so central banks are always on the lookout for fresh ways of defeating the counterfeiters and reassuring the public. *Exchange* takes a look at current trends in security features.

In the 30 months between January 2011 and June 2013, 24 countries ranging from Angola to Thailand issued new families of banknotes, which included a total of 114 individual denominations. According to De La Rue feature usage figures, colour changing was the dominant security feature of choice across these families.

Colour changing features, both in print and thread, have been having a good decade. Since Romania introduced the first colour shift thread in the early 1990s, this feature has seen consistent growth. And for a number of good reasons, according to De La Rue Currency's Line of Business Director John Winchcombe. "The short answer is that they work – the public recognises them. But they are also robust in circulation, and can be combined with magnetics, for machine readability, and fluorescence. They offer design flexibility and can be easily integrated.

"What's more, counterfeiters find these features difficult to replicate as there is nothing commercially available that they can use."

Some 42% of the new banknotes issued since the beginning of 2011 have adopted printed colour changing features, with 40% using colour changing threads. Five of the 24 new families (21%) had both print and thread colour changing features. This not only provides a belt and braces approach to security, but also makes public education more straightforward.

Interestingly, some of the most successful features (according to these latest feature usage figures) use techniques that have only become available relatively recently. The Motion™ feature, for example, which uses micro-optic technology to give the effect of movement, was only launched in 2006, and the SPARK® optically variable ink in 2008. This indicates the willingness of the market to adopt innovations.

Stripes, of all sorts, continue to be popular, with growth in the use of foil and iridescent stripes.

But as new features appear, earlier ones become less popular for a variety of reasons. The uptake of holograms, for example – which was strong in the 1990s and still a force in the early 2000s – appears to be levelling off although many banks like to employ a combination of features, and holograms continue to be widely used, including for the new euro series.

Predicting the future of security features is tricky but these latest feature usage figures do demonstrate the willingness of issuers to make changes.

"Features which have movement as part of their effect hit the scene in the late 2000s, were well accepted and seem set to grow," John Winchcombe says. "But the market providers need to overcome the challenge of their durability so that they are suited for use not only in a high value note but also in a low value note in countries with more rigorous circulating conditions."

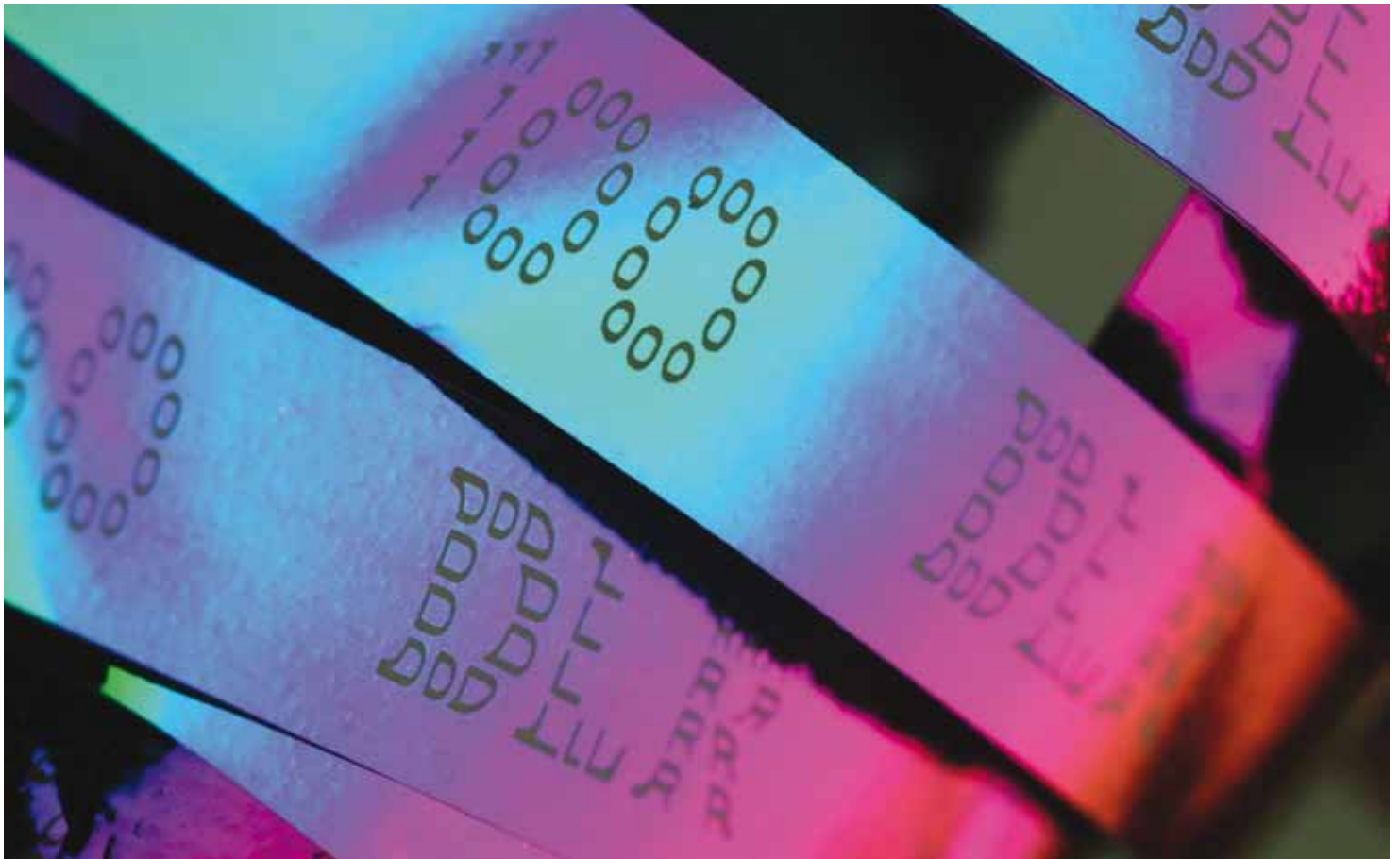
The feature usage figures also show central banks selecting features for specific denominations. For example while Motion™ thread was used in a quarter of the new currencies, it featured in just 12 denominations. This suggests that issuers are pursuing a concept of a hierarchy of features in accordance with the threat to the banknote and its face value rather than 'one size fits all'.

"Another anti-counterfeiting measure often proposed," John Winchcombe says, "is putting microchips into banknotes.

But the benefits of this are not clear cut. Apart from the fact that it would be difficult to ensure the robustness of the note, you also have the question of what the chip is for. What would its function be, when there are already low cost alternatives to almost anything it could do?

"Furthermore, chips would be seen as removing the anonymity of banknotes, and that is something I believe the public would be unwilling to accept."

The past does not predict the future and change is the only constant. The good news is that the rate of innovation and opportunities to invent and create seem to be increasing, offering choice to central banks around the world.





Fiji's stunning and award-winning new currency series is a perfect fusion of the country's rich flora and fauna with beautiful banknote design – and with the country's first polymer note it also delivers improved durability and security features.

New Fiji currency celebrates natural treasures



In 2012, the Reserve Bank of Fiji (RBF) needed to change the country's banknotes for the second time in five years. And, as is often the case with currency projects, they needed to do so in a hurry. They were also facing the problem of trying to increase note life in a challenging climate: Fiji's mixture of hot, humid and rainy weather can be hard on banknotes.

Faced with this set of challenges, the RBF made some important decisions. First, they chose to replace the \$2 note with a coin and introduce the country's first polymer banknote in the \$5 denomination. And second, they decided that the theme of the new series would be the country's indigenous flora and fauna. In essence they wanted to take the opportunity to make their currency more Fijian. The theme was kept under wraps until the new series of banknotes was unveiled live on national television at the end of 2012.

Polymer banknotes have been on the market for a while and, as more countries successfully launch polymer notes and start to see the benefits of increased durability, other central banks around the world are taking notice.

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"THE NEW SERIES OF BANKNOTES HAS BEEN RECEIVED EXTREMELY WELL BY ALL FIJIANS. THE DESIGN CHANGES INCORPORATED FIJIAN ELEMENTS INTO THE BANKNOTES AND THEY REFLECT FIJI'S OWN BIODIVERSITY AND NATURAL HERITAGE – ELEMENTS WE ARE RICH IN. WE ARE EXTREMELY PLEASED WITH THE POSITIVE FEEDBACK WE HAVE RECEIVED."
BARRY WHITESIDE



Previously, the Fijian paper \$5 note was subject to tremendous wear and tear. With the move to polymer the \$5 note is expected to benefit from extended notelife, which is typically about 2.5 times that of paper notes. The vibrant green \$5 polymer note includes a window with an image of a Fijian warrior – the same as the watermark used on the previous set of notes (and which also appears on the rest of the new series) – which is central to the improved security of the notes as it is extremely hard to copy.

Barry Whiteside, Governor of the Reserve Bank of Fiji, said "The decision to switch to polymer banknotes was primarily based on achieving increased circulation life in lower denominations, while also achieving cost savings over time. The vibrant green colour on the \$5 note materialises extremely well on polymer and also correlates with the flora and fauna themes. We ran an extensive PR campaign using television, radio, newspapers, and visits to schools to prepare the Fijian public for the new notes."

Another key factor in the RBF's decision to launch a polymer note was that even though the \$5 note *feels* different, it nevertheless *looks* like part of Fiji's new series. In fact, the new cotton-based notes have also been protected by De La Rue's Platinum® coating to increase their durability.

Once the RBF decided on the theme of flora and fauna for the series, they set up a design committee, including Fiji's most eminent experts in nature and science, who chose the species for the notes and coins. These experts were an important element in the successful launch of the series as they were on hand to ensure that the designs of the animals and plants were correct down to the smallest detail.

The animals chosen included the *Nanai*, a species of cicada that appears on the \$100 note. On the original designs, the *Nanai*'s wings were open. But on the final printed image they are closed – which is how they look when this cicada appears once every eight years. The experts also gave detailed specifications for the number of the scales on the *Beli* fish that features on the \$10 note, and a steer on the rare *Kulawai* parrot that appears on the \$5 note and has been seen by only one person in the last five years.

The new series of notes was launched at the beginning of 2013 and the polymer \$5 entered into circulation in April 2013.

Barry Whiteside adds: "The new series of banknotes has been received extremely well by all Fijians. The design changes incorporated Fijian elements into the banknotes and they reflect Fiji's own biodiversity and natural heritage – elements we are rich in. We are extremely pleased with the positive feedback we have received."

And it hasn't taken long for the new series to receive recognition on a wider stage as the RBF won the regional banknote best new series of the year award at the Asian, Middle East and African High Security Printing Conference in October. Fijians can be justifiably proud of their beautiful, practical and secure banknotes.

DE LA RUE AND THE RESERVE BANK OF FIJI

De La Rue has been printing currency for Fiji since 1913 and the country remains one of the company's long-established customers. So it was entirely appropriate that in April 2013 the RBF became the first customer in the world to issue a banknote printed on Safeguard™, De La Rue's polymer substrate.

The new series of banknotes, which included the \$5 polymer note and cotton paper \$10, \$20, \$50 and \$100 notes, was printed at De La Rue's factories in Malta and Sri Lanka. Fiji's new \$2 coins were minted by the Royal Canadian Mint.

The RBF put production of its new series of banknotes out to tender. To help win the contract, De La Rue's designers created a set of beautiful black and white pencil drawings to help bring the animals to life and show how they might look on the notes.

De La Rue advised the RBF on a range of options including a full series of polymer notes or selected denominations in polymer. The RBF chose the mixture of polymer and cotton paper banknotes and the De La Rue team focused on ensuring that the design and security elements of the polymer note were in harmony with the rest of the series.

Once the contract was won and designs for the series of notes approved, the full strength of De La Rue's banknote expertise swung into action to ensure that the vibrant colour of the \$5 polymer notes on the computer screen – and indeed on the rest of the new series – was replicated in the final product. Both the customer and end users were delighted with the final results, and so was De La Rue.



DE LA RUE'S BANKNOTE OFFERING

Paper continues to be the dominant substrate for banknotes, accounting for approximately 95% of the world's banknotes in circulation (the remainder being polymer banknotes or other alternatives). Those figures aren't going to change significantly anytime soon but central banks are constantly looking at how to make notes more durable and secure and polymer is an option increasingly being considered.

As a trusted partner of central banks across the world De La Rue has the knowledge and expertise to guide banks through the minefield of substrate choice. De La Rue is the only banknote printer with its own polymer substrate product – Safeguard™; the result of a four-year development and investment programme – and as a result, is the only company that can genuinely offer customers the unbiased choice of both paper and polymer banknotes.

For many banks, paper banknotes will continue to be a cost-effective and highly secure solution and the need for enhanced durability can be met with pre- and post-print coating and reinforcing. While polymer notes are typically more expensive to produce, they last longer in circulation and they can incorporate a range of alternative security features not available on paper banknotes.

So, is plastic really fantastic? The experience of the 20 or so countries that currently have polymer notes in circulation (seven of them have all denominations in polymer) seems to suggest so. From the banks' perspective, polymer notes are typically lasting up to 2.5 times longer than paper-based banknotes. Polymer is also acknowledged for being a secure substrate – Australia and New Zealand, both issuers of polymer notes, reported reduced counterfeiting rates following the introduction of polymer banknotes.

From a user's perspective, the notes are tear resistant and stay cleaner.

Some Australians claim to put the notes in their pockets when they surf or even inside sports shirts when they run, as the notes don't disintegrate from water or sweat. Certainly, polymer notes can survive the washing-machine and they are stain resistant. However, they don't fare too well if you iron them.

Polymer is definitely here to stay and more and more countries are considering this as a viable option. For example, after a three-year research programme, the Bank of England is currently carrying out a public consultation exercise on the adoption of polymer. The process is due to conclude at the end of 2013, when a final decision will be taken on whether to move the £5 and £10 to polymer when the new Winston Churchill and Jane Austen designs are launched in 2016 and 2017 respectively.

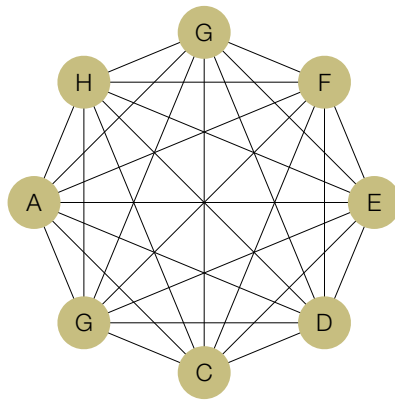




Making strides towards the global inter-operability of ePassports

As the number of countries issuing ePassports continues to grow, a global system set up by the International Civil Aviation Organization (ICAO) is helping to ensure that the ePassports are checked quickly and effectively – and that they are confirmed as valid and legal documents.

BILATERAL EXCHANGE OF CERTIFICATES



In 1998 Malaysia introduced the world's first electronic passport, containing text, a photo and a thumbprint, all stored in a single data file on a 8kb electronic chip. Since the 9/11 terrorist attacks and increasing concerns over national security, electronic passports or ePassports have been introduced by more than 100 different countries. And with good reason – ePassports hold biographical and biometric data (personal details, facial data and in some cases fingerprints) on an electronic chip (typically 72kb), that is hard to tamper with or replicate; and the documents' authenticity can be quickly checked by border officials.

It is estimated that 500 million ePassports have been issued to date worldwide. Whilst that figure is still relatively low compared to the approximate figure of 125 million traditional passport books being issued across the world every year, ePassports are the future of travel identity documents. Along with robust issuance and identity establishment processes, their use is what ICAO, the specialised United Nations agency that sets standards and regulations for aviation safety and security, is recommending.

For any country, implementing an ePassport programme requires significant investment across a range of government departments to reap the full benefits of biometric identity verification. These departments – typically passport and border control – will have separate budgets and often very different priorities. Any investment starts, of course, with the ePassport itself, which needs to be machine readable and contain the relevant technology embedded in the chip. But in addition ePassport reader technology has to be introduced at all borders and a Public Key Infrastructure (PKI) has to be set up to authenticate the data stored electronically in the chip. Costs vary from country to country,

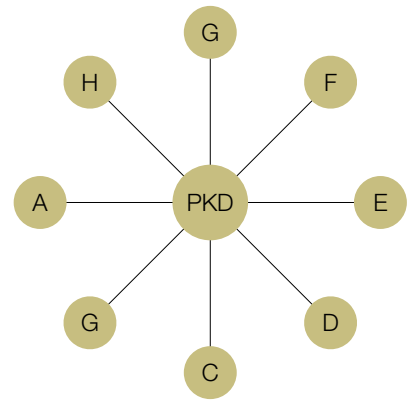
for example, in the UK the set-up costs for the ePassport programme were £61 million, plus an additional £195 million from 2006 to 2011 for producing the electronic element of the new passports.

When ePassports are read at passport control, the border officer passes the data page through a special passport reader that reads the data on the chip. The officer then visually confirms the identity of the ePassport holder and a cryptographic application checks the country-specific digital signature of the issuer to verify that the ePassport has been issued by a legitimate authority and that it has not been altered. All ePassports should carry a copy of the issuer's PKI certificate, but these certificates are also exchanged between participating countries, along with 'revocation lists', listing certificates which are no longer valid. This process of exchange, which must be trustworthy, is an essential element of the ePassport systems' infrastructure.

Managing individual relationships to obtain this information from all the other issuing countries is a complex task. To facilitate the growing numbers of ePassports, the ICAO has set up a global exchange called a Public Key Directory (PKD) to help border control authorities manage the process quickly and effectively.

The ICAO PKD acts as a central broker to manage the exchange of certificates and certificate revocation lists among countries. Participating countries deposit the data that other countries need in order to ensure that their ePassports are authentic. Importantly, the ICAO PKD only contains information that confirms if the signature on the ePassport is genuine and that the data has not been tampered with – it does not contain any personal information about the passport holder.

ICAO PKD EXCHANGE OF CERTIFICATES



Without the PKD, each country must exchange the relevant information on a bilateral basis; for example, sharing information between just eight countries requires 56 bilateral exchanges. The ICAO PKD reduces this number to just two exchanges – when a country deposits its information, and when it receives data regarding all the other members (as shown above).

Surprisingly, despite the growing numbers of ePassports, only 37 countries are currently subscribers to the ICAO PKD. The countries using the system are the issuers of three quarters of all ePassports in circulation and for them it is proving to be an effective management tool for their passport issuing agencies, allowing them to share their certificate-based information in anticipation of its use elsewhere.

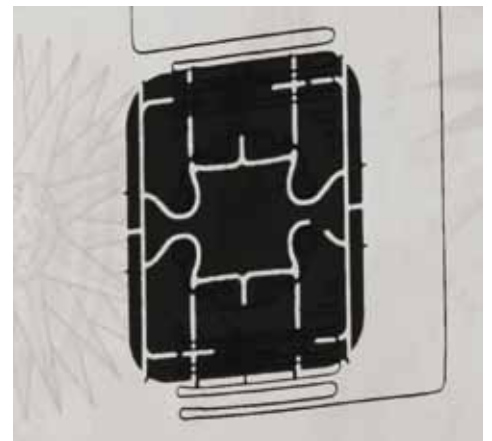
For the benefits of inter-operability of ePassports to arrive on a global scale, everyone has to be moving in the same direction – and that's not currently the case. Although the US and Europe are leading the way in terms of ePassport issuance, and the countries in the Asia-Pacific region are increasingly coming to the party, there are many countries in Africa, Central and South America who have yet to commit to the new technology. With many countries, especially in the developing world, facing a raft of different challenges including civil wars, population displacement, drought, famine, lack of healthcare and water shortages, finding funds to invest in new identity technologies is not a top priority.

An important element in ePassport validation, the ICAO PKD is helping to improve border security and international travel. It brings global inter-operability a step closer – but getting to the stage where the full benefits are being reaped across the world is going to be a slow process.

DE LA RUE AND ePASSPORTS

De La Rue Identity Systems is one of the world's leading suppliers to passport issuing authorities and is involved in setting the future direction of ePassport developments with international standards bodies. De La Rue currently delivers more than 14 million secure identity documents every year for some 20 customers, including the prestigious contract to produce the UK's ePassport, one of the world's most secure identity documents.

The company supports the development of the ICAO PKD as an effective tool to help governments manage the increasing number of ePassports. It is also an active attendee at ICAO conferences and events to discuss key topics in global security.



Speaking to each other: smart solutions to international visa challenges

A growth in travel and an increase in the number of visa applications is creating new challenges for border agencies and visa issuing authorities. *Exchange* talked to Mike Anderson, Director General, International and Immigration Policy at the Home Office, about how the UK is addressing the issues.



The volume of international travel is on the rise. The World Tourism Organization (WTO) estimated that one billion tourists travelled the world in 2012. Increasing numbers of students are applying for visas to study overseas. And the expansion of world trade inevitably means that more and more business people travel in pursuit of commercial opportunities.

According to a WTO report published in 2012, the UK seems to be relatively tourist friendly with only 10% of tourists coming into the country requiring visas. Over the past year, the number of Indian students applying for study visas for the UK is said to have risen by 20%.

But changes in visa policies can have a significant impact. For example, the WTO report suggests that a relaxation of visa requirements increased the number of tourists coming to the UK from Taiwan by about 3.3%. In May this year, UK Cabinet Office Minister Oliver Letwin announced that there had been a 75% increase in the number of UK visa applications from China since 2009. Changes to UK visa requirements for Chinese citizens introduced in 2012 had been specifically designed to encourage such growth.

On the other hand, the introduction in 2009 of a visa requirement for tourists from South Africa may have reduced the number coming to the UK by as much as 35% over recent years.

The challenges now being faced by border agencies and visa issuing authorities inevitably vary according to a country's geographical position. EU member states with common borders have different requirements to those of an island or the long borders of a land mass such as North America.

Yet while countries may adopt different policies, the technologies they employ may be applicable more widely.

What trends do you see emerging as travel volumes increase?

The UK Home Office is keen to go digital – to identify systems which will enable large volumes of passengers to come through ports and airports more efficiently, but with no reduction in security. This will not undermine the skills of the border officers but enhance their capacity to spot those who are travelling illicitly.

This approach will use biometrics as a means of 'fixing' travellers' identities. Indeed some countries are already looking into the possibility of embedding an individual's biometrics into his or her smartphone.

There have also been some interesting developments overseas. For instance border software shared by the USA and Canada ensures that a single transit of the border is simultaneously recorded as an entry in one country and an exit in the other.

South Africa is able to record every entry and exit by a traveller on a single computer system – which sounds as though it should be standard, but is not so common. They also record the border officer who passed each traveller, through a system based on the biometrics of the officer as he starts his laptop and on the biometrics of the South African passengers who pass through the border.

With increasing volumes of visa applications, which new approaches to handling them would best suit the UK?

Again, the Home Office favours a digital approach to processing applications. We have also outsourced the management of Visa Application Centres to commercial organisations, which are proving to be a successful way of managing the increase in application numbers in many countries around the world, particularly the large volumes in South Asia, West and East Africa.

Another way of handling a spike in demand for visas – for instance among foreign students applying in the run-up to a new academic year – is by interviewing those applicants by video conferencing while they are still in their home country. In the UK, this 'triage' approach runs from a single site – a centre, based in Sheffield, which is able to handle large volumes of interviews remotely.

Signatories to the Schengen Agreement, that enables passport-free movement between many European countries, seem to benefit from their partnership by sharing the load of overseas applications. One Schengen country can, in certain circumstances, handle the visa application for another. Britain and Ireland are currently piloting a common tourist visa. Do you see opportunities for the UK to partner with other countries in this way?

It would certainly be possible to share part of the application process with other countries. The front end of the process – the gathering of information and biometrics – is largely identical across a number of countries. All entry clearance operations depend on:

- Fixing the identity of the individual
- The individual's entitlement to enter the country
- Issuing of permission to enter.

All the same, although the front-end application operation might be shared, the application itself would still have to be routed to the appropriate national authority for clearance.

How does data privacy and information security assurance impact the management of increasingly large volumes of visa applications and transnational cooperation?

We need to make sure data systems can speak to each other and the Home Office has tasked Government Digital Services with making UK systems more 'intelligent'.

Any integrated system will also need to be able to access data relating to criminal activity held by agencies such as Interpol, but data protection and privacy remain critical in our management of data relating to foreign visa applicants.

Data is only shared for specific purposes, and in fact it is not always easy to share data with other countries as every country has different rules on the storage and management of personal data.

However, the Home Office is considering how to identify risk more effectively and data mining will of course be part of that discussion. But the rules on data mining will need to be thought out very carefully.

With rising volumes of visa applications, do you envisage an increase in the resources of the Border Agency?

The Government's strategy up to 2018 is to reduce spending, and the Immigration Service is taking significant cuts. However, Government is working on the best ways of managing the increase in applications against this backdrop and is in particular looking at:

- Changes in handling data, including greater digitisation
- Outsourcing: what are the most appropriate areas for outsourcing and to what degree?
- Ensuring that different elements of the immigration system are joined up, while remaining focused on people and not just process.

The priorities are secure control, customer service and tough treatment for those who break the rules.

What arrangements are in place to ensure that Britain 'stays open for business', while maintaining an appropriate level of control over entry?

The Home Office liaises closely with the Prime Minister's Office, the Department for Business, Innovation and Skills, the Chancellor of the Exchequer, Foreign and Commonwealth Office (FCO) and VisitBritain – all of which have a mandate for promoting economic growth in the UK.

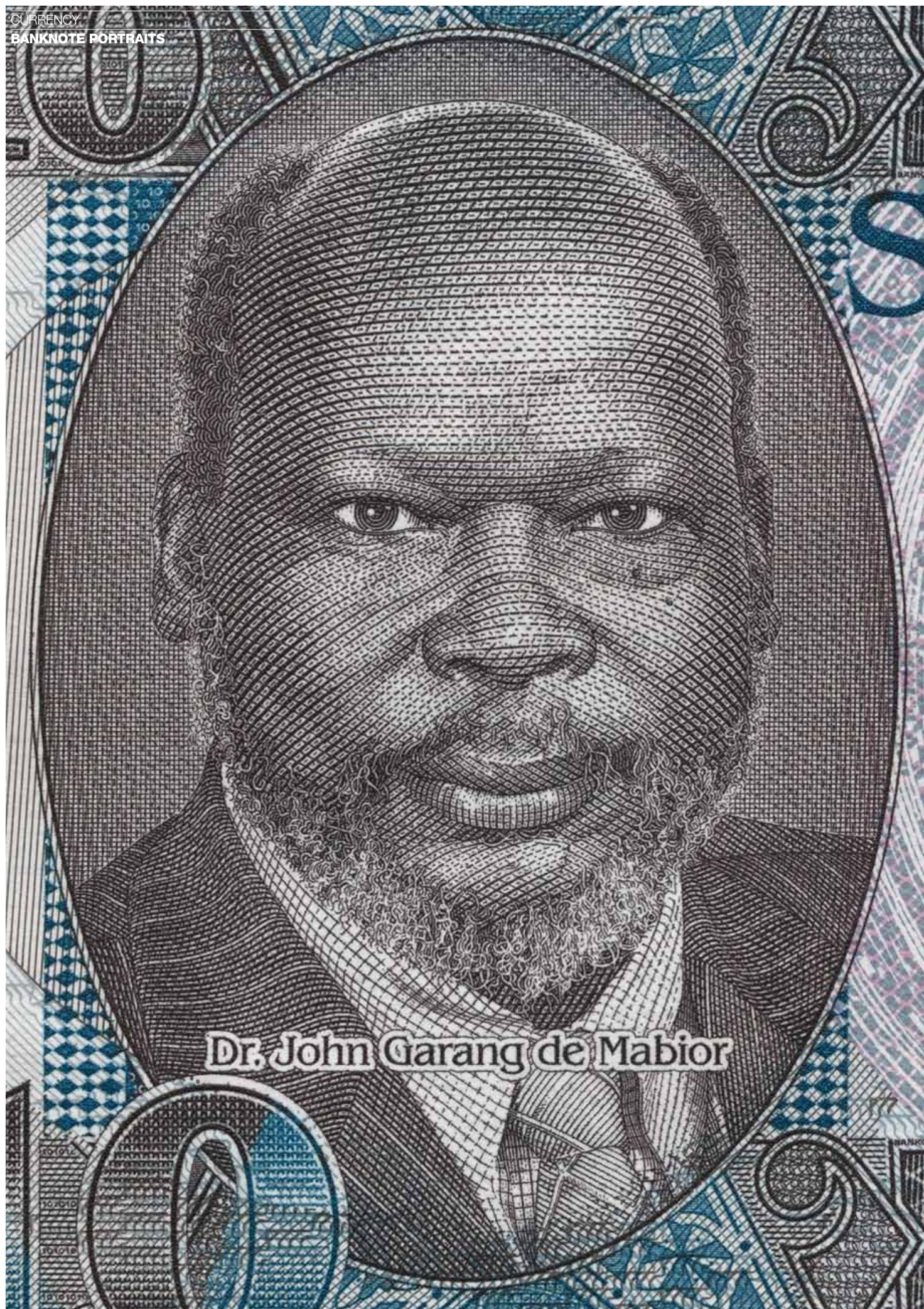
And we all share a joint aim of delivering policy stability.

In the short to medium term there will be no significant change to policies on visas issued for study, tourism or work purposes. The Immigration Bill introduced in October of this year will focus on restricted access to public services for those who have no right to be in Britain, changes to the appeal system and will address sham marriages for the purpose of obtaining UK residency.

Furthermore, the strategic direction of the Home Office is to improve customer service – and specifically to enhance the processing of tourist and business visas while retaining appropriate levels of control based on an analysis of risk.



DE LA RUE IS INVOLVED IN THE TRAINING OF MEMBERS OF THE NATIONAL DOCUMENT FRAUD OFFICE FOR THE UK HOME OFFICE.



Worldwide, governments and central banks choose banknote images that reflect their country's achievement and identity. Often these are human portraits. *Exchange* looks at how an original image is converted into an effective banknote portrait that wins the public's trust.

The eyes have it

Some currencies, for a variety of reasons, do not use portraits at all. The euro, for example, cannot do so without showing bias towards the subject's nation of origin. Its solution is to opt for images of architectural achievement instead. In some countries the issue is avoiding the reproduction of 'icons' for political or religious reasons.

What all nations agree on is that public trust in banknotes is key, and trust depends on belief in the note's authenticity. That judgement may be based on quite intangible factors. *Does the note make me feel good?* Many central banks opt for portraits for that reason: a human face, carefully chosen and depicted, may inspire confidence. Some also believe the public would spot counterfeits more easily because of a different 'look' in the face. Eyes are especially individual in an engraved portrait.

Portraits began to appear regularly on European banknotes around the 1930s, when public trust in the economy was at a low following the First World War and its repercussions. In 1934 Poland used national hero Tadeusz Kościuszko on the 100 zloty note – the head of the armed forces. A year later Spain chose Nobel Prize winner Santiago Ramón y Cajal for the 50 peseta note.

Gradually the use of prominent figures from the sciences and arts became more commonplace. In the same way that celebrities are used to advertise consumer products today, individuals (alive or dead) who the public instinctively respected were placed on banknotes to promote confidence in the currency and the economy. Today, subjects range from monarchs and leaders to high achievers in just about any other field.

Source material

Once the central bank has chosen a subject for a banknote, what happens next? Typically an existing image of some kind is needed for the portrait designers and engravers to begin work. If the figure is deceased, the bank might provide an early photo. This can be challenging, particularly if it's a snapshot rather than a posed portrait. The eyes may appear as no more than two dark patches. But where the image is chosen for its iconic status, the design team must accept the original image and enhance it as best they can.

Sometimes the source is not an existing photograph or painting, but a statue. The old £20 sterling note from the 1970s depicted Shakespeare. The image was taken from his statue in Westminster Abbey. This meant that the designers made no attempt to show his eyes – which would have looked odd – and instead produced a portrait that was clearly from a statue.



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"BECAUSE THE ENGRAVER NEEDS STRONG LINE AND DEFINITION, MY ROLE IS OFTEN A SIMPLIFICATION PROCESS, A DISTILLATION OF WHAT'S IN THE PICTURE. THAT MEANS NOT EVERY DETAIL IS RELEVANT TO THE PORTRAIT WE END UP WITH."

LUIS MORRIS, DE LA RUE DESIGNER



A PORTRAIT OF THE QUEEN FOR THE ROYAL BANK OF SCOTLAND JUBILEE £10 NOTE.

A painterly approach

In the case of the Queen of the United Kingdom, where the subject is living and is depicted on notes all over the Commonwealth, new images are supplied by Buckingham Palace as appropriate. Nevertheless De La Rue designer Luis Morris – an accomplished portrait painter in his own right – once had to produce his own painting of the Queen, based on a supplied photo, for a Commonwealth country note in order to make the image clearer for the engraver.

By contrast, as part of a family of banknotes for Jamaica, he was asked to design an image of an important 19th century slave, Samuel Sharpe. The only existing likeness was a crude sketch. It was the image by which the slave was known, but very difficult to replicate other than by producing an original painting.

But what makes it to the design stage is significant: "Because the engraver needs strong line and definition, my role is often a simplification process, a distillation of what's in the picture. That means not every detail is relevant to the portrait we end up with."

Key factors in engraving

The engraving stage produces the distinctive appearance in banknote design. It helps to legitimise the note in the public's mind. The designer passes on the portrait and details of the size it needs to be. The engraver then begins by drawing tonal areas onto the image, over-emphasising light and shade. He overlays it with tracing paper and draws the image in pencil. De La Rue engraver Steve Matthews explains, "It's important to find my way around the face. You need to get the facial features absolutely right. At the beginning I might spend a whole day on a sketch and then throw it away. I always 'knit' the face into the hair. If you do it the other way around the hair can end up looking like a wig!"

Next he focuses on line direction, first drawn in pencil, then in ink. He uses a range of solid and dashed line work depending on the effect needed. To soften an image, for example for a woman's complexion, he uses 'inter-dot', placing dots inside the diamond lined pattern.

"It takes me about seven weeks to do the Queen," Steve explains. "There's a lot of pressure, knowing who will be approving it! Other portraits typically take between three and seven weeks, depending on size, gender and skin tones. Darker skin requires more work, so takes longer."

Steve recently completed a portrait of the Queen for the Royal Bank of Scotland Jubilee £10 note, taken from a relaxed image at the races (pictured above). By contrast, he also engraved the Queen in ermine for Jersey's £100 Jubilee note.

The best portraits

What is needed to make a really good portrait? "It needs to have life," says Luis. "Especially in the eyes. The drawing must be solid and convincing. And it must be a typical likeness of the subject. It needs to hit the spot."

"My preference is for a challenging figure," says Steve. "Older men and ladies are more interesting, with more detail in the face. But you have to be careful with wrinkles, often only selecting the more important and definable ones from the original image."

Different approaches to the image

A carefully produced portrait is very difficult to reproduce. It combines sharp engraving with a softness and sensitivity that would be lost if copied. So it plays an important role in security. The main portrait can be reproduced elsewhere in the note to aid public recognition and as an anti-counterfeit measure.

If the portrait appears in the hologram, it is prepared in a completely different way, with blue highlights added to dark hair, for example, since black is unsuitable for technical reasons. For the watermark image, there is more focus on tonality.

Technology has inevitably changed the way portraits are produced. The designer uses a computer to manipulate the image, giving it more light or shade to help the engraver. He may also need to alter the angle of the head slightly or make the nose look a little shorter. The engraver can now sometimes work directly from a good quality photo. Some portraits are entirely computer generated – the Bank of Scotland's image of Sir Walter Scott, for example.



VENEZUELA'S AWARD WINNING BANKNOTES FEATURE PORTRAITS OF SIMON BOLIVAR AND OTHER LEADING FIGURES FROM VENEZUELA'S HISTORY, CHOSEN TO REFLECT THE COUNTRY'S ETHNIC DIVERSITY.

THE BANK OF SCOTLAND'S IMAGE OF SIR WALTER SCOTT IS ENTIRELY COMPUTER GENERATED.



Continued on page 16



Modern trends

Banknote portraits have grown in size since they first began to appear early in the 20th century. In the 1920s a portrait would have taken up no more than about 10% of the note. By 2000, the proportion was typically 40%. Now 'off running' portraits are popular, where the figure extends beyond the boundary of the note and appears to be approaching the viewer.

Recently banknotes have been used to make political statements. In February this year Libya replaced Gaddafi's portrait with other Libyan images such as architecture and natural landscape features. In November 2012, Nelson Mandela became the first portrait on South African currency since Jan van Riebeeck, Dutch founder and colonial administrator of Cape Town, in 1993.

Meanwhile Sweden has adopted a modern approach, choosing a series of 20th century figures, all popular with the public, internationally known and with a good gender balance. They include actress Greta Garbo, writer Astrid Lindgren and director Ingmar Bergman.



CONTEMPORARY 'OFF RUNNING' PORTRAITS EXTEND THE FIGURE BEYOND THE BOUNDARY OF THE NOTE.

CHANGING TIMES

De La Rue engraver Steve Matthews last completed a traditional engraving in around 2001, using a square graver tool to cut the image into a plate. He had to use an eye glass, traditionally working on a banknote-sized image, with the lettering, portrait and numbering created on individual plates. He trained for around 10 years, first as a 'vignette engraver' (animals, buildings, scenes) and later as a 'portrait engraver'.

Before technology began to play a role in banknote design, De La Rue designer Luis Morris painted watercolour images onto airmail paper using special sable brushes – to size – to pass on to the engraver. "Consistency was very important, so I had to produce the same painting in different colour washes". Now portraits are more commonly drawn in pencil at the design stage, and at four times banknote size.

Spreading the knowledge

André Haughton's road to success was not an obvious one.

He was brought up by his mother – a single parent – in a 'garrison community' in Montego Bay, Jamaica.

The rules of such communities are, according to the country's leading newspaper *The Gleaner*, "enforced by paramilitary-like gangs [whose] activities overlap with those of criminal gangs".

His first primary school class was the lowest in the year, and in high school he was more interested in playing football and being the 'cool kid' than in studying.

But André was bright: exceptionally bright. And when he was 15, a teacher helped him to focus on what he wanted to achieve – and he turned his life around.

He got the highest grade in the country in his Accounts exam, and two years later graduated from sixth-form – though even that was fraught. "After my sixth-form graduation, we were walking back in a group. It was in a volatile area and a group of guys came and attacked us. I got stabbed two times."

The struggle his mother and grandmother went through to pay the fees for his first year of study at the University of the West Indies made him vow that he would never put them through that again. "I said to myself that next year I have to get a scholarship."

And he did – a KPMG Peat Marwick Scholarship to complete his undergraduate studies.

His first class degree in accounting and economics led to a Masters in economics, which was funded by a Thomas De La Rue Scholarship – "I couldn't have done it otherwise" – and subsequently to a PhD in economics at the University of Essex, supported by a British Commonwealth Scholarship.

Then, as Dr André Haughton, he returned to Jamaica, wanting "to serve not just my country but the region as a whole". This service takes many forms. He now lectures in economics at the University of the West Indies. He is a writer and a conscious role-model. "There is a disconnect between youth and education in this country. I want to help them to improve themselves, so I work as a motivator to school and university students."



He also has a weekly column in *The Gleaner* explaining economics in a simple way to help improve financial literacy in Jamaica. "In the UK, if interest rates change by 0.25% people discuss it. But in the Caribbean, if the rate changed by 3% no-one would care. People in Jamaica don't have savings so it doesn't matter to them what the rates are."

But there are advantages to saving, and at the other end of the Caribbean, the Central Bank of Trinidad and Tobago has launched a National Financial Literacy Programme (NFLP) to encourage it. The Bank's Governor, Jwala Rambarran, says: "We visit communities and explain the benefits of saving – why they should be doing it, what they should look for and so on. We give guidance to the population at all ages and levels of society, from school children to pensioners."

"The aim of the NFLP is to build skills in the population to enable them to better understand the benefits that financial services can provide."

The Programme's own description of its purpose is to "develop a nation of citizens

who are conscious about and capable of managing their finances. This involves altering beliefs and attitudes about money and related issues and subsequently people's behaviour where money and finance are concerned". Topics covered range from budgeting and debt management, to mortgages, planning for retirement, and record keeping for micro entrepreneurs.

"We are currently working on a formal financial inclusion strategy," says Governor Rambarran, "and intend to commit to the Maya Declaration later this year."

The Maya Declaration, drawn up by the Alliance for Financial Inclusion in 2011, is the first global and measurable set of commitments, by developing and emerging country governments, to unlock the economic and social potential of the 2.5 billion 'unbanked' people through greater financial inclusion. More than 80 such countries – representing more than 75% of the world's unbanked population – have supported the Declaration.

Governor Rambarran is also keen to bolster the high level financial skills available locally: at the specific request of the Governor, the scope of the scholarship programme has been broadened to include actuarial science as well as finance and economics.

Matt West, Head of Sales for the Caribbean, who champions the programme on behalf of De La Rue, says: "We believe that the programme is good for the regional economy and now offer five scholarships at the University of the West Indies – one each year to the Central Banks of Trinidad and Tobago, two to the Bank of Jamaica, and one every two years to the Central Bank of Barbados and the Eastern Caribbean Central Bank." The ECCB has its headquarters in St Kitts and functions as the central bank for eight smaller island states of the Eastern Caribbean. "In addition, as part of the Central Bank of Trinidad and Tobago's 50th anniversary celebrations, in 2014 we are offering an additional four scholarships. We will also be offering an eight-week internship with De La Rue in the UK. That will run in the summer as Caribbean students would prefer to avoid the English winter!"

Making tobacco control a global priority



The World Health Organization's Framework Convention on Tobacco Control (WHO FCTC) has been described by many as the world's first public health treaty. Developed in response to a worldwide tobacco epidemic, the WHO FCTC contains a set of wide-ranging measures and recommendations that will require governments to educate their populations about the negative effects of tobacco, better control the tobacco market and reduce the illicit trade in cigarettes.

The WHO FCTC is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. The protocol to Eliminate Illicit Trade in Tobacco Products, the first Protocol to the Convention, was adopted on 12 November 2012 at the fifth session of the Conference of the Parties in Seoul, Republic of Korea, and is currently open for signature by the Parties to the WHO FCTC.

The protocol will enter into force 90 days following the 40th country to ratify it and at the time of going to press 36 have already ratified the protocol ahead of the deadline of 9 January 2014. Once in force signatory countries will then have a maximum of five years to implement the requirements. This represents a major change for tobacco control measures for governments and tobacco manufacturers across the world.

The WHO FCTC treaty comprises an extensive series of measures to control tobacco. Some relate to price levels and taxes; others are non-financial approaches such as regulating the contents, packaging and labelling of tobacco products, promoting smoking cessation campaigns and research, as well as surveillance and exchange of information.

The FCTC's governing body, known as the Conference of the Parties, can also make recommendations and decisions to promote the implementation of the treaty by adopting a protocol. In this instance the first protocol focuses on the illicit trade in tobacco products. At the heart of the protocol is the requirement that member states will establish national tracking and tracing systems using unique, secure and non-removable identification markings within five years of the protocol coming into force.

It is important to note that the WHO FCTC stipulates that government policies shall not be performed by or delegated to the tobacco industry. The framework allows member states to help control the illicit tobacco products supply chain more effectively and without the interference of the tobacco industry.

Illicit trade in tobacco products comes in many forms – from lone offenders stealing cigarettes to highly organised criminal gangs that not only move huge quantities across borders but also have the capacity to manufacture, package and distribute counterfeit cigarettes in their own factories, often with significantly increased toxicity levels.

In 2012, EU customs officials intercepted counterfeit cigarettes worth a total of €200 million at external borders. The EU's illicit cigarette market consists of cheap whites (produced legally outside the EU and smuggled in) and counterfeit cigarettes (generally produced in China and smuggled in).

The largest seizure of illicit cigarettes in Europe was made in Northern Ireland in 2009 when customs and police intercepted 120 million cigarettes worth €50m which were en route to the UK market. The cigarettes originated from the Philippines and were shipped in 16 40-foot containers, hidden in animal feed.

Customs officials across the world face the constant challenge of trying to reduce the flow of illicit tobacco products across borders by sophisticated and well-funded criminal operations. Recent successes include the capture of millions of illicit cigarettes concealed in a liquid petroleum gas tanker in South Africa and the seizure of 5 million cigarettes in Hong Kong that had been smuggled in from China. Last year a 700-metre professionally-mined underground tunnel between two border towns in the Ukraine and Slovakia was discovered. The tunnel was primarily being used for smuggling cigarettes across the border. This is, without doubt, a global problem.



Prensa AFIP

CUSTOMS OFFICERS WORLDWIDE ARE TRYING TO REDUCE THE FLOW OF ILLICIT TOBACCO PRODUCTS ACROSS BORDERS.

Continued on page 20



ANY LONG-TERM SUCCESS IN THE BATTLE AGAINST ILLICIT TOBACCO CAN ONLY COME ABOUT THROUGH CO-ORDINATED AND SUSTAINED EFFORTS BY POLICE AND CUSTOMS OFFICIALS, GOVERNMENTS AND THE TOBACCO INDUSTRY.

The WHO estimates that up to 600 billion cigarettes are circulating in the global black market, which represents about ten per cent of the total global cigarette market.

Where there are borders that illicit goods can easily be transported across and price and tax differentials to be exploited, there will always be opportunities for criminals. For example, in Eastern Europe, there are significant movements of illicit tobacco products with criminal gangs seeking to take advantage of price differences between neighbouring countries. A packet of premium cigarettes in Belarus, Russia and Ukraine can be as much as €2 cheaper than in Poland and other neighbouring countries. The UK has one of the highest rates of tobacco duty in the EU, which makes it both a lucrative and an attractive market for smugglers.

In North America and Canada, there are price differences of \$5 from states to Canadian border provinces and from state to state in the US. It is estimated in North America that successfully smuggling and selling a truckload of cigarettes can result in a profit of \$2 million. When the incentives are there, the criminals will follow. And follow they have.

The FCTC recommends that one way of fighting illicit trade is through the introduction of a government revenue solution commonly known as a tax stamp. Tax stamps should be unique, secure and have non-removable identification markings (such as a code), and enable governments to collect revenue on every pack of cigarettes or tobacco sold. Customs officials can identify very quickly if products are illicit and packs can be tracked, in real time, across countries and continents to check the provenance of both stamp and product.

The WHO's Tobacco Free Initiative (a WHO programme set up in 1998 to focus international resources and attention on the global health issue of tobacco) recommends that the most up-to-date technologies should be adopted, wherever possible – in particular state-of-the-art monitoring of the supply chain, and tracking and tracing systems on products. And to reinforce the FCTC's goal of policies and programmes being free from tobacco industry influence, the protocol suggests that these codes or tax stamp programmes should be run by independent third-party companies rather than by the tobacco industry.

Many countries already run government revenue solutions for tobacco and alcohol products. In 2011 more than 70 governments had programmes in place and there were over 120 billion tobacco stamps in use to fight illicit trade and boost revenue.

Nevertheless, there are still more than 100 countries that have no government revenue programme on tobacco products in place at all. It is estimated that close to \$40 billion in revenue on tobacco products is not being collected, and of that \$33 billion would go straight towards increasing government finances with the rest going to the tobacco industry.

The increased government revenue which successful programmes would produce could be used to fund health education and smoking cessation programmes – a key part of protecting current and future generations from the consequences of smoking.

Naturally, long-term success in the battle against the movement of any kind of illegal goods can only be achieved through co-ordinated and sustained efforts by police and customs officials, government departments and the tobacco industry, where knowledge, best practice and information can be shared across borders.

E-CIGARETTES

Another challenge facing governments across the world is the advent of electronic cigarettes (e-cigarettes). As yet, there is no overarching legislation for the new phenomenon of e-cigarettes and as a result in some countries they are classified as medicinal products rather than tobacco products, which means they can be advertised on television. In other countries like Brazil, Canada and Singapore e-cigarettes are currently banned.

E-cigarette manufacturers claim their products can help people give up smoking. But the benefits and risks of e-cigarettes are uncertain – to date there have been no significant studies to determine if they are an effective way to stop smoking or if they have harmful effects.

First introduced onto the Chinese market in 2004, there are more e-cigarette products being launched this year, some of which are being backed by tobacco companies. This may be the time for global legislation of the e-cigarette market.

DE LA RUE AND GOVERNMENT REVENUE SOLUTIONS

De La Rue has vast experience and expertise in the introduction and management of revenue protection schemes in 20 countries across the world through its Government Revenue Solutions business.

This year, De La Rue introduces its next-generation track and trace system specifically designed to address revenue protection programmes for governments. It links secure stamps and unique codes to a central database holding important production and tax data enabling government officials to track activity and verify products quickly in the field.

Based on De La Rue's experience, introducing unique identifying marks to individual products can significantly reduce illicit trade and boost revenue collected on the sale of high tax products. Across North America, Europe, Asia and Africa the implementation of tax stamp projects has led to significant gains including revenue increases in excess of 100%. When compared to the modest costs involved, the return on investment is very attractive and the payback period is short.

De La Rue's status as a long-term trusted partner of governments in areas of key national interest such as banknote production and identity systems will be key as countries seek to adopt the WHO FCTC treaty and accompanying Protocol.

Compliance might appear daunting but De La Rue's Government Revenue Solutions team can provide expert guidance to help national and regional governments to implement successful schemes.

Helen Cochrane, from De La Rue's Government Revenue Solutions, says: "Governments across the world have recognised the importance of the WHO FCTC. With growing numbers ratifying the Illicit Trade Protocol they must now consider how best to implement the required marking, tracking and tracing of tobacco products.

De La Rue's great experience in implementing successful government revenue programmes, and our relationships with industry bodies and stakeholders put us in a great position to advise and provide recommendations for success."

Still innovating after 200 years

1813 was an important year in the history of innovation. *Exchange* looks back, but mostly forward, at some of De La Rue's pioneering developments.



Two hundred years ago, the inventor of shorthand Isaac Pitman and the great scientific investigator and explorer David Livingstone were born. So, too, were arguably the two greatest operatic composers of that century, Giuseppe Verdi and Richard Wagner. Perhaps it was something in the air, but in February of that year Thomas de la Rue founded the company in Guernsey that was also to make its mark on the history of ideas.

One of the earliest De La Rue innovations was a revolutionary typographical process to print playing cards that had previously been produced by hand using stencils. Among many others through the 19th and 20th century were the first envelope folding machine, displayed at London's Great Exhibition of 1851, the first surface-printed and perforated stamps, the first windowed metallic thread in banknotes, joint development of the world's first 'hole in the wall' automatic teller machine (ATM) and, more recently, the design and production of the new UK ePassport.

Innovating for the future

Today, De La Rue continues its unwavering focus on innovation and ideas generation, in order to offer customers the very latest technologies and services.

• **Research partnerships**

Our technical partnerships with carefully selected suppliers and academic institutions mean we are constantly up to date with the most recent developments in our field and often directly involved in projects with universities and small businesses. We keep all our industry-related institutions around the world on the radar and often collaborate with them on physical science research. This gives us visibility of developments in world leading technology in our fields of interest and means we can choose where to focus our research activity.

• **Leading-edge technology**

We have invested in an industry leading technology centre to provide physical science R&D with laboratory based and piloting capabilities under one roof. Here we are developing pioneering technologies in areas such as nanotechnology, photonic crystals, research into substrates (papers and polymers), and components like holograms, foils and security threads.

• **Customer conferences**

De La Rue runs dedicated conferences to understand future customer needs. An example is the Advanced Banknote Manager Course, for central bankers, in which we share our expertise on how a banknote is created and used through its life cycle. We also explain our role in R&D and use these sessions as a crucial sounding board for customer feedback, providing samples of the latest innovations.

• **Industry recognition**

In April 2013 we won the Queen's Award for Enterprise: Innovation for our wide Optiks™ banknote security thread and associated papermaking technology. Optiks™ is a milestone in the development of banknote design and production, and just one example of our commitment to new ideas that ultimately benefit our customers around the world (see page 23).

World view



Libya

Following the revolution in Libya in 2011, one of the first tasks of the Central Bank of Libya was to replace the banknotes to reflect the new regime. In late 2012 De La Rue was awarded the contract following a robust international tender process and work on the new banknotes began in earnest. Libyan designers provided the original design concepts reflecting iconic images of the country. Working in close cooperation with De La Rue's design team these were transformed into the final banknote designs. On 17 February 2013, to mark the second anniversary of the revolution, the first of the new banknotes was introduced into circulation.

New Mauritius RS500

Mauritius has launched new polymer banknotes, including the RS500 which is produced on Safeguard™, De La Rue's polymer substrate. The new polymer note follows closely the design of the equivalent paper banknote but has a clear 'window' area showing an image of the Dodo. In this window there is also Spark® Orbital™, a bright, eye-catching blue/green ink which changes colour as the note is tilted and which can be seen from both sides of the note (see page 2). De La Rue's relationship with Mauritius dates back to 1860 when the company first produced the Mauritius 10 shilling, £1 and £5 notes.





Queen's Award for Enterprise: Innovation

In April 2013 De La Rue won the Queen's Award for Enterprise: Innovation for its super wide Optiks™ banknote security thread with a clear window in the banknote, and the associated papermaking process. Optiks™ represents a step change in both security thread and papermaking technology. This is the twelfth time that De La Rue has been honoured with a Queen's Award.



THE QUEEN'S AWARDS
FOR ENTERPRISE
INNOVATION
2013

Barbados

A new family of banknotes was issued in Barbados on 2 May 2013. This is the first major redesign of Barbados' banknotes since the first series was issued in 1973. The six denominations – \$2, \$5, \$10, \$20, \$50 and \$100 – have been retained in this new issue. The imaginative design of the new series includes portraits on the front of famous Barbadians who have made a significant contribution to society, with new reverse images celebrating their achievements. De La Rue has worked closely with the Central Bank of Barbados since it was established, and was delighted to be asked to contribute to the design of the new banknote series. In addition to designing and producing banknotes for Barbados, De La Rue manufactures the Barbados passport.



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The Commonwealth Baton Book

Working alongside 33Fifty: the Commonwealth Youth Leadership Programme, delivered in partnership by the Royal Commonwealth Society and Common Purpose, De La Rue has created a unique handmade document in honour of the Queen's Baton Relay – the much celebrated opening tradition of the Commonwealth Games.

The '33Fifty Baton Book' is accompanying the Baton as it travels around the world on its journey to each of the 70 nations and territories that make up the Commonwealth covering 190,000km over 288 days, before making its way to Glasgow for the Games in May 2014.

At the end of its journey, it is intended that this specially designed document will carry the words and messages of the Commonwealth's young people – one from each stop on its way – and be given to the Commonwealth leaders of the future.



New De La Rue House Passport

Based on a theme of travel, navigation and international timelines, the design for the new De La Rue house passport reflects De La Rue's rich global heritage by celebrating some of the iconic landscapes, monuments and wildlife from the many regions it has worked in around the world.

Behind these strong designs, there is a highly sophisticated collection of security features carefully layered to combat specifically identified threats and ensure the book's integrity. And naturally, the security features are all fully compliant to the guidelines recommended by The International Civil Aviation Organization (ICAO).



Microsoft Quarterly Scorecard Performance

De La Rue received praise for their strong performance during the first quarter of 2013, on their strategic supplier scorecard from Microsoft. The evaluation covered four key categories: Execution Excellence, Cost, Continuous Improvement and Customer Partner Experience (CPE). De La Rue's Microsoft account director Mark Smith, says improving the performance in the scorecard is down to a team effort across the whole of De La Rue's Microsoft business: "This is a terrific achievement and one of which everyone should be very proud," he says.

Exchange

THE GLOBAL MAGAZINE OF DE LA RUE

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