

IACCT (China) White Paper



FinTech : The Disruptive Technology Coming to Treasury

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About IACCT (China)

In 2004 the Hong Kong Association of Corporate Treasurers (HKACT) initiated the China Treasury Forum to promote the development of professional corporate treasury best practice in China. This initiative has now developed into the China-focused corporate treasury association called IACCT (China) or International Association of CFOs and Corporate Treasurers (China), incorporated in Hong Kong in early 2006.

Its mission is to:

- Encompass the positioning of Hong Kong as a global financial centre.
- Support a network of treasury and finance professionals across industry bodies in China's Greater Bay Area.
- Enhance education and training opportunities to upskill our talent pool.

IACCT (China) is represented on the Working Group on Corporate Treasury Development formed by the Hong Kong Monetary Authority since 2012. The new Corporate Treasury Centre (CTC) Policy introduced by the HKSAR Government in 2016 has attracted an increasing number of Mainland Chinese enterprises to set up CTC in Hong Kong to be their offshore platform to support their overseas expansion.

IACCT (China) together with HKACT are members of the International Group of Treasury Associations (IGTA) to foster exchange of best practices among treasury professionals. (IGTA website: www.igta.org)

Message from the President of IACCT (China)

The international financial landscape is changing rapidly with the relentless advance of new technologies being an important driver of growth in a world of sharing economy.

In recent years, technology is making possible targets that once seem impossible. The speed with which new technological tools and applications are designed and applied is increasing significantly.

Application of financial technologies (Fintech) enables financial institutions and technology firms to join hands to enhance consumer experience, raise operational efficiency, achieve frontier breakthrough and, most importantly, provide great support to the corporate treasury community

The most exciting scenario for treasury teams is that there is no need to wait to begin increasing efficiency and control from new technologies. Effective tools are readily available at your fingertips.

We, corporate treasurers, support innovation and FinTech to raise operational efficiency and improve quality of treasury management.

WE EMBRACE TECHNOLOGY!

Gogo KO

August 2018

Executive Summary

The financial services industry is encountering an unprecedented challenge from a technology revolution brought by a global army of financial technology (FinTech) companies, many of which are startups with their strength not in size and capital, but in innovation and speed of execution. Several international organisations, including World Economic Forum and IMF, are optimistic on the prospect and the potential benefits of the latest technology.

Governments of many countries have given the development of the FinTech sector a very high priority in their policy agenda due to the long-term strategic value of technology to the society. Hence, different incentives and financial assistance have been provided to encourage firms and talent to participate in the growth of this sector.

However, the trace of technological penetration is not apparent in the treasury space. In a poll conducted during the recent IACCT & ATC Treasury Forum in Hong Kong, it showed that Excel spreadsheet is still the most common tool used for treasury management. The adoption of the more advanced technology, such as artificial intelligence, machine learning and distributed ledger technology, is close to being negligible. However, given the speed of the technological change and the wider use of technology in front-line business, there is a compelling need for treasury to get up to speed on this front.

In fact, corporate treasurers are standing in the forefront and are able to feel the tide of this technological change. FinTech development is bound to have a profound impact on many aspects of treasury management in the future. We are aware that the front-line businesses of many industries have already made noticeable adjustment in their business model to leverage on the technology advancement for meeting customers' higher expectation on ease and speed of transactions. Treasury has to progress at least in the same pace in order not to fall behind the curve.

Amongst the many new technologies, five of them warrant treasurers to stay on the lookout for their development and applicability to treasury operations. These include:

- *Distributed ledger technology*
- *Robotic process operation*
- *Open API*
- *Smart contracts*
- *Artificial intelligence*

The technology will not only change the way that treasurers manage the operations, but also potentially reshape the long-established working model with the relationship banks. In the not-so-distant future, treasury may work in a bimodal for sourcing financial services in which banks will still play a major role as the product and credit providers. But the technology firm is a new alternative channel for certain services or products for their competitiveness or creativity.

While technology brings tremendous benefits in terms of innovation and productivity, it also causes concern on whether the digital workforce will cannibalize the human staff. If automation is inevitable, treasury professionals will have to prepare to shift gears by changing our mindset to embrace a human-machine relationship and acquire new skillsets required under the new technological environment.

At the end of the paper, we have made a few points of recommendation for transforming a treasury into a technology-enabled operational model, namely: a) process re-engineering, b) talent strategy, c) new collaboration model, d) system readiness and e) roadmap.

FinTech Overview

Technology has been reshaping the banking landscape in the recent years. The Financial Technology (FinTech) space has continued to attract serious money for its huge potential in revolutionizing the financial services industry. According to Accenture¹, the venture capital financing to the FinTech sector accelerated to a record level of US\$27.4 billion in 2017, an increase of 18% from the previous year. Many countries around the world have formulated policies to create room for innovation and devoted resources to assist the industry in order not to fall behind in this race of innovative technology. In Hong Kong, the government has reaffirmed its commitment to the development of innovation and technology. The Financial Secretary of Hong Kong SAR announced in his budget speech in February 2018 that HK\$50 billion will be set aside for this purpose. In addition, The Hong Kong Monetary Authority (HKMA) has rolled out nine smart-banking initiatives², including the Faster Payment System and the Open Application Programming Interface (Open API). Besides, it has also established a Fintech Facilitation Office to promote Hong Kong as a FinTech Hub in Asia. In May 2018, HKMA published a revised Guideline on Authorization of Virtual Banks and the interested companies will have to submit their application by 31 August 2018. It is expected that the emergence of virtual banks will further encourage innovation and technology in the provision of financial services. There are already over 50 companies which have indicated their interest to operate a virtual bank in Hong Kong.

“... now is an exciting time for financial innovation.

Technology is a game changer for the future of banking, payment and other financial services ...”
Norman Chan, Chief Executive of HKMA

Some independent international organizations also have high hope on the prominent prospect of the latest technology. The World Economic Forum³ predicts that 10% of global GDP will be stored on blockchain by 2027 and the first AI machine on a corporate board of directors will appear by 2026. The Managing Director of IMF, Christine Lagarde, also

¹ Accenture New Release “Global Venture Capital Investment in Fintech Industry Set Record in 2017”. 28 February 2018. <https://newsroom.accenture.com/news/global-venture-capital-investment-in-fintech-industry-set-record-in-2017-driven-by-surge-in-india-us-and-uk-accenture-analysis-finds.htm>

² HK MA Press Release “A New Era of Smart Banking”. 29 September 2017. <http://www.hkma.gov.hk/eng/key-information/press-releases/2017/20170929-3.shtml>

³ World Economic Forum. Deep Shift – Technology tipping points and societal impact

pointed out⁴ that while we have to be cautious on “the dark side of crypto-assets”, some emerging technologies do have potential benefits to society. For instance, she mentioned that the distributed ledger technology could help enhance the efficiency of the financial markets and provide a means for secure storage of important records, such as property rights.

Whether [the technological change] turns out to be a threat or opportunity to the treasury profession or individual practitioners depends a lot on the preparedness to embrace this new paradigm.

As the power users of banking services, corporate treasurers are standing in the forefront and are able to feel the tide of this technological change. FinTech development is bound to have a profound impact on many aspects of treasury management in the future. Whether it turns out to be a threat or opportunity to the treasury profession or individual practitioners depends a lot on the preparedness to embrace this new paradigm. To those who better understand the implications of this technological revolution and well prepared to grasp the opportunities, will stand to benefit from the advanced technology that they can leverage on. On the other hand, this wave of change may become disruptive to those who fail to recognize the coming of a new era of technology or are unable to move forward at the same speed. Therefore, we cannot afford to fall behind the curve. The purpose of this whitepaper is to review the latest technologies that are most relevant to corporate treasury and discuss the potential impact that they will bring.

The FinTech Ecosystem

In the FinTech world, there are more than just the banks and the technology firms. A sustainable development of FinTech requires a strong and cohesive ecosystem.

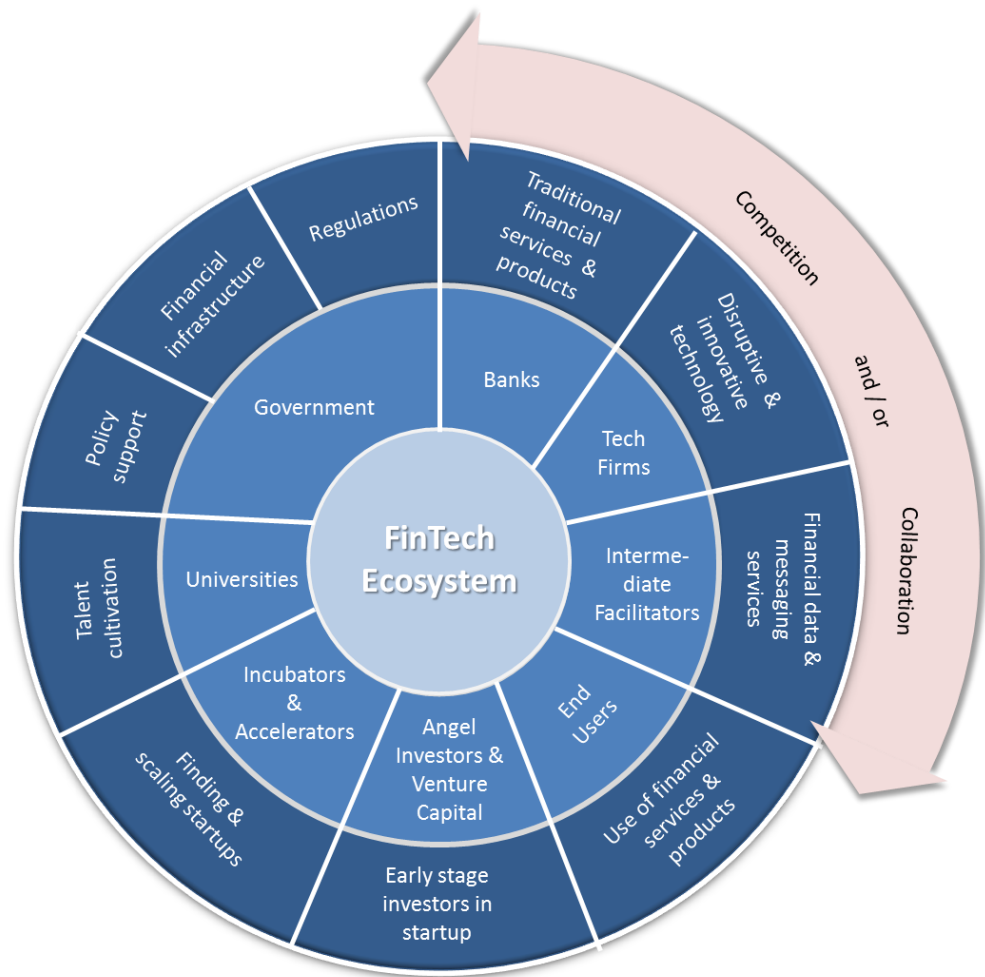
An ecosystem usually refers to a system within which a group of elements or species interacting closely with each other and the environment that they live in. In the context of FinTech, the ecosystem

⁴ IMF Blog by Christine Lagarde. An even-handed approach to crypto-assets. 16 April 2018. <https://blogs.imf.org/2018/04/16/an-even-handed-approach-to-crypto-assets/>

involves the key FinTech participants whose activities are interconnected to and have impacts on each other, resulting in a complex relationship.

The FinTech ecosystem is not static. In fact, there are competing forces within the system that keep changing the dynamics and balance between the participants.

Diagram 1 : FinTech Ecosystem: The Key Participants and their Roles



Banks have historically been the centre of gravity for traditional financial services. They allocate funds from depositors to borrowers, act as fund transfer agents, trade in the forex and other financial markets, offer financial advice and investment services, and so on. However, in the

wake of significant advancement in technology development and higher expectations from customers on banking services, banks are facing unprecedented challenges from the FinTech firms.

On innovation, there are many cases where the technology startups have outsmarted banks ...

On innovation, there are many cases where the technology startups have outsmarted banks because the startups have much greater freedom to experiment, can do away with the organizational silos and be spared the long consensus-seeking process between the different stakeholders. Some of the products launched by the startups have already convinced the market that the technology deployed by them has the genuine potential to fill the expectation gaps that currently exist in many areas of banking services, such as payment and trade finance.

The competition does not only exist between banks and startups. Some of the intermediate facilitators, e.g. SWIFT, also feel the heat. In fact, a number of the FinTech firms are gaining their foothold in the cross-border payment space which used to be the turf of SWIFT by rolling out the instant fund transfer services. Competition aside, some banks and startups have turned to a collaboration model by forming a consortium to explore the use of FinTech to speed up the innovation process and provide better services to their retail and corporate customers.

Most of the FinTech startups are rich in innovative ideas but they usually need a certain level of assistance to turn those ideas "from powerpoint into product". During this process, incubators play the role of finding and growing the pre-revenue stage startups with the potential of offering them financial and business support (e.g. rent-free workspace) while accelerators further upscale them for commercialization. For the much needed capital, startups rely a lot on the angel investors and venture capital as their early-stage investors. In exchange, these investors see the upside potential on the equity that they invest in.

Government involvement and support are necessary for the healthy and long-term development of the FinTech industry. In its role as the regulator, it defines the policy framework and regulatory landscape in order to ensure a level playing field to the participants. The initiatives of Open API in Hong Kong, Open Banking in the United Kingdom, PSD2 in

the European Union, API Playbook in Singapore and Open API in Japan, are all good examples of the regulators in promoting and opening up the data markets for third party service providers to design and provide more innovative products or services to the end customers of banking services. The importance of maintaining a safe and reliable financial infrastructure by the government cannot be overstated as it ensures the existence of a trusted and efficient platform for the transfer of cash and foreign currencies. At the same time, government is also the facilitator to the creation of a business-friendly environment to nurture the startups and promote the development of this strategically important sector. The regional collaboration between governments to promote FinTech development is also increasing. In October 2017, HKMA and the Monetary Authority of Singapore jointly announced a trade finance infrastructure project (see “Distributed ledger technology – trade finance” below). In June 2018, HKMA and the Financial Services Regulatory Authority of Abu Dhabi Global Market signed a co-operation agreement to enhance cooperation on the FinTech development in both markets.

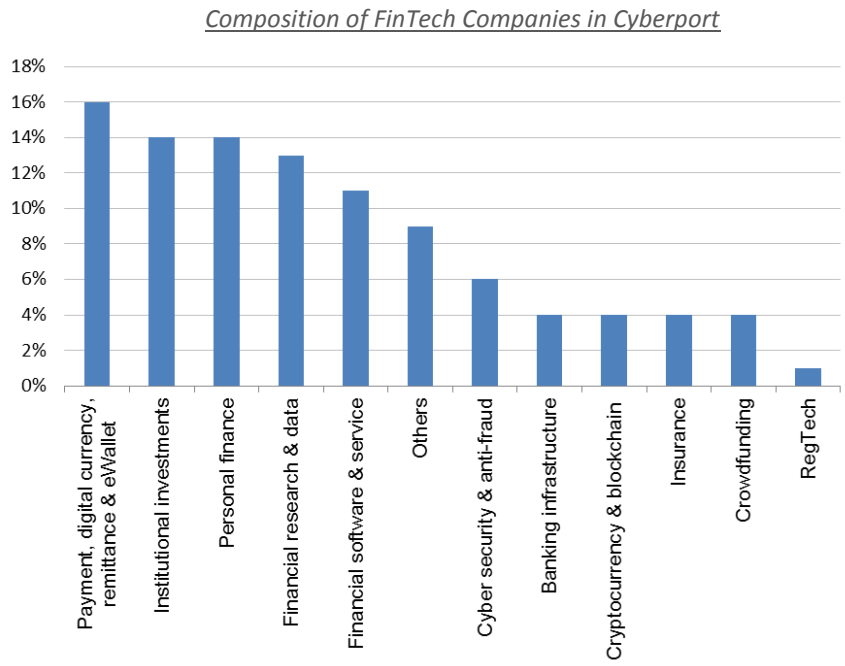
Although the role of academic is less mentioned, the picture would be incomplete if they are missed out from the FinTech ecosystem. First of all, academia has made notable contribution in the fields of data analytics, AI and cryptography technology. Many of the top-notch scientists in technology firms were outstanding researchers in the technology fields at universities. More importantly, university is also the place which cultivates the talent for banks and FinTech firms which are desperate for high-quality young professionals. In fact, two universities in Hong Kong, namely, the Hong Kong University of Science and Technology and the University of Hong Kong have offered FinTech courses on the online education platforms. Similarly, The Hong Kong Polytechnic University has launched a university-industry collaborated FinTech centre to nurture talents in the region.

Exhibit 1 : Cyberport

Cyberport, which is wholly owned by the Hong Kong Government, plays an instrumental role in developing the digital tech industry in Hong Kong. Currently, more than 200 FinTech companies are located in Cyberport which makes it the largest FinTech community in the city. Recently, many of the leading financial institutions and corporates have approached Cyberport to source latest technology and innovative ideas from the startups housed in Cyberport.

In order to nurture and support the startups, Cyberport has offered an incubation programme which includes the provision of financial assistance, professional services as well as rent-free working space. One of the key challenges of the FinTech startup is the shortage of talent. Under the latest government policy, the incubatees of Cyberport’s incubation programme are eligible for a fast-track arrangement to admit overseas and Mainland technology talents to participate in the R&D works.

According to the latest statistics, the top three categories of FinTech companies in Cyberport are (i) Payment, digital currency, remittance & eWallet, (ii) Institutional investments and (iii) Personal finance. Please see the following diagram for the detailed breakdown.



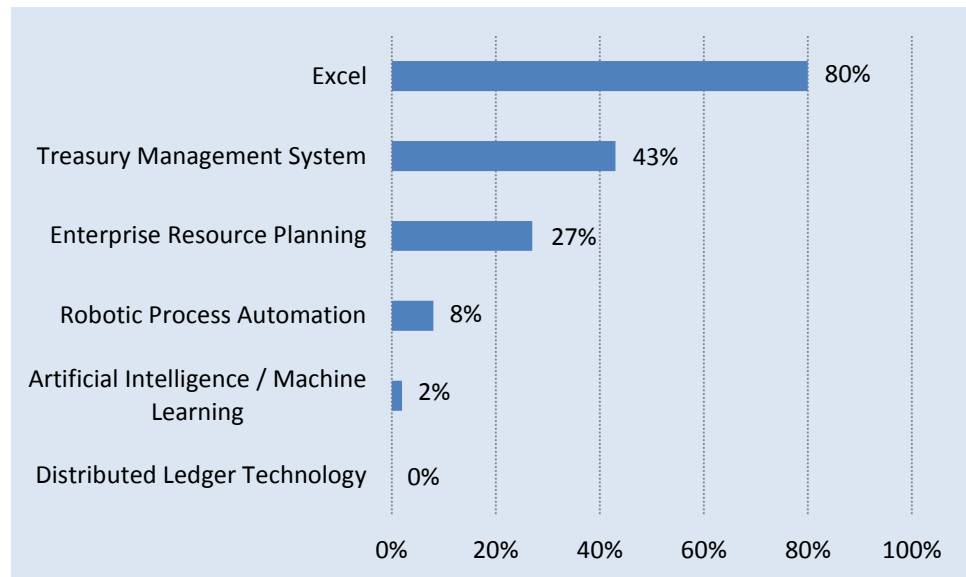
Source : Cyberport: Hong Kong’s Leading FinTech Community (Data updated as of May 2017)

3 Reasons Why FinTech is not Widely Adopted in Treasury (Yet)

In the recent IACCT & ATC Treasury Forum 2018 in Hong Kong, some 180 treasury professionals were asked about the technology they currently use in treasury. The poll result to this question shows that Excel, the good old friend to all working in accounting and finance, still comes up on top,

followed by Treasury Management System and ERP System. The use of the more advanced technology, such as Artificial Intelligence and Distributed Ledger Technology, is close to being negligible.

Figure 1 : Poll Result on Treasury Technology Adoption



*Source : IACCT & ATC Treasury Forum 2018 – Hong Kong
(note: figures do not add up to 100% as some companies may have adopted more than one type of technology)*

To treasury, FinTech is still the road less travelled ... They need more proven cases to give them the confidence on the technology's reliability.

Why is FinTech not gaining traction in Treasury? There are at least three good reasons. First of all, although there are some successful cases in applying the advanced technology, there are not many which have moved beyond proofs-of-concepts. Even for those that have, they are either small in scale or may not be able to benefit treasury operations directly. To treasury, FinTech is still the road less travelled. Treasurers, most of them being risk-averse, are usually not keen on being the first mover in technology. They need more proven cases to give them the confidence on the technology's reliability.

Secondly, there is an acute shortage of people with the technical skills in FinTech and this is a global phenomenon. This makes it extremely difficult to move forward a FinTech project from planning stage to

implementation stage. For example, a thorough data cleansing process is required for deploying technology to carry out data analytics. However, data scientists are sought after in the labour market, not to mention having one in treasury. According to the survey by Glassdoor, data scientist is the best job in America for the third year in a row because of the high demand, high salary and high job satisfaction.

Lastly, a full adoption of digital transformation in treasury may involve an overhaul of the corporate's IT system which is much more complicated than installing a stand-alone system in the department. Due to the challenges in building a business case and cross-departmental coordination, it will be an uphill battle to drive this initiative by treasury alone.

Technology Redefining the Speed of Information

In the technology space, the change is progressing at an exponential rate. It is most apparent if we compare what a smartphone or tablet can do today versus a decade ago. These gadgets have totally redefined the meaning of "speed of services". If we do a Google search or personal banking transaction on our smart phone, we expect an almost instant response at our fingertips. Anything longer than 5 seconds will be unacceptable by today's standard. Unfortunately, this experience is not able to be carried over to our working life. Obtaining full visibility of real-time cash position or receiving cross-border payment instantly is still something we long for if treasury is running without the help of more advanced technology.

If the front-line business is already able to execute a sales transaction in a split of second, it will appear to be unreasonably slow if treasury takes days to move the liquidity to the place where the business needs it.

The fact is that treasury is not working in a vacuum. It is indeed one part of the entire business process and thus has to walk in the same pace with other departments. If the front-line business is already able to execute a sales transaction in a split of second, it will appear to be unreasonably slow if treasury takes days to move the liquidity to the place where the business needs it. In the near future, it will not be surprising that Treasury has to manage the operations with the up-to-the-second

position on cash flow, interest rate and foreign exchange exposures. Such speed of near-real-time information is already happening in the supply chain management, thanks to the state-of-the-art technology.

Datafication of Treasury

“The world’s most valuable resource is no longer oil, but data”... The Economist.

To coin a phrase from the headline of The Economist⁵, “the world’s most valuable resource is no longer oil, but data”. There is no doubt that more companies are now deriving competitive advantage from their use of data and analytics. Nowadays, the high performing teams or organisations always distinguish themselves by data-driven decision making.

According to a 2017 survey by Gartner on data and analytics (D&A)⁶, 48% of companies in APAC have achieved the top two levels of D&A maturity (i.e. Level 4 and 5), which compared favorably with their counterparts in North America (44%) and EMEA (30%). However, only 9% of the organizations worldwide were able to attain the highest level (i.e. Level 5) to reap the transformational benefits of D&A. Organizations at the transformational level are usually characterized by putting D&A in the central place of their business strategy.

Treasury interacts with business units, financial institutions, customers and suppliers frequently. Through these internal and external interactions, a wealth of financial and operational data have been generated, most of which may currently be left untouched and unnoticed. We have to recognize that these data are critical asset to treasury and corporate if we know how to make use of them. The key is to find the best way to extract and distill useful information from the data pool through datafication. Datafication is the process that uses advanced technology to turn a process or activity previously not

⁵ The Economist. 6 May 2017 edition.

⁶ Gartner. "Survey Analysis: Traditional Approaches Dominate Data and Analytics Initiatives." <https://www.gartner.com/newsroom/id/3851963>

quantitatively identifiable into data which are then able to be tracked, monitored and analysed through analytics.

As Whatsapp has datafied our instant communication with people, Alibaba our (window) shopping experience and Google our knowledge of everything, we stand at a favorable position to datafy treasury management by unearthing many of the hidden but useful data and then converting them into structured and digitalized format for analysis by (operational or predictive) data analytics techniques. The objective is to draw inference from these data sets based on verifiable evidence and translate them into business intelligence and insights on specific issues, such as predictive cashflow variability or customers' payment pattern. Treasury that can harness these data management capabilities effectively will be able to stand out among its peers and push the boundary of its responsibilities beyond the traditional treasury functions.

Major Technology Development that Can't be Ignored

The choice of a suitable technology still depends on the major functions of each treasury.

While there are a number of new technologies which have been making significant progress in the FinTech space, some are particularly relevant to corporate treasury. Of course, the choice of a suitable technology still depends on the major functions of each treasury - a payment factory has very different focuses from a full-fledge headquarter treasury of an MNC. Before we can make an informed decision on which technology can best benefit your operations, we have to get on top of the key features of the major technologies.

Distributed Ledger Technology (DLT)

DLT is a decentralized log of records collectively managed by the participants in the system without a central authority. The most well-known DLT is blockchain. Some commentators regard blockchain as the technology leading the Internet into a new era. Internet has been used in

the last few decades for transferring information only. However, only when blockchain was invented, transacting or transferring of assets, such as money, shares, bonds, intellectual properties, from peer-to-peer over the Internet has been made possible. Strictly speaking, blockchain is not a new technology. It was born when the white paper titled “Bitcoin: A peer-to-peer electronic cash system” written by a person or group named “Satoshi Nakamoto” was released on October 31, 2008. The paper has explained how bitcoin is created based on the blockchain technology. But also because of this origin, a common response to blockchain is “we are not a tech company and our business has nothing to do with bitcoin trading. Blockchain is not something we will pursue”. People holding this view have lost sight of the technological power and potential of blockchain.

Blockchain is a decentralized ledger that records transactions chronologically and permanently across the peer-to-peer network. The transaction history is cryptographically locked and thus all the records are immutable. As a result of this, blockchain reduces the cost of verification and eliminates the need for the services of the traditional trusted third parties. Due to the decentralized nature of blockchain, chances of the data being lost or corrupted by hackers are extremely remote as there is no centralized location for the transaction records.

The fact is that blockchain is far above and beyond crypto currency. A new generation of applications that addresses the issues on trust and transparency has been built and is based on the blockchain technology. At the same time, various DLT platforms have also been evolved and developed to cater for more specific requirements on speed, confidentiality and privacy protection etc. In fact, DLT and blockchain have already found its ways into a variety of innovative uses. Below are some of the good examples:

Trade Finance

Trade finance is one of the forerunners in exploring the adoption of DLT. Currently, the shipping and logistic industries are still largely paper-based. The reliance of paper documents, e.g. bill of lading and letter of credit, has made the business process inefficient and prone to fraud. DLT is able to speed up the flow of trade documents, streamline the shipping

process and create more transparency in the trade finance market. In one of the pilot cases, the time used in the exchange of the letters of credit has been reduced from up to 10 days to less than 24 hours. According to BCG, the digital startups in the shipping and logistics sector has absorbed more than US\$3.3 billion of investment from venture capital over the last 6 years⁷.

In October 2017, HKMA and the Monetary Authority of Singapore inaugurate a new era of regional cooperation to jointly develop the Global Trade Connectivity Network (GTCN), a cross-border infrastructure to digitalize trade and trade finance between Hong Kong and Singapore⁸. The GTCN is based on DLT. Another DLT-enabled trade finance initiative, called Marco Polo, has signed up a growing number of banks to provide a global trade and supply chain finance platform, which supports open account trade finance.

Payment

Blockchain technology companies, such as Ripple and R3, have shaken up the payment sector which used to be dominated by banks and SWIFT. These tech firms have launched payment services on their own platforms which allow almost instant cross-border funds transfer and settlement services in which the entire process can be completed within seconds. The immutability nature of blockchain drastically reduces the back-office work on post-remittance reconciliation. Also, with the almost instantaneous receipt of funds, corporates at the receiving end enjoys significant improvement in working capital and short-term funding cost. That is why blockchain payments are gaining traction in the cross-border payment market.

Ant Financial Services, the payment giant in China and an affiliate of the Alibaba Group, has flexed its muscles and joined the fray in the cross-border money transfer business recently. The service, enabled by

⁷ BCG. "The digital imperative in container shipping". 2 February 2018.

⁸ HKMA Press Release "Hong Kong and Singapore launch a joint project on cross-border trade and trade finance platform". 15 November 2017 <http://www.hkma.gov.hk/eng/key-information/press-releases/2017/20171115-6.shtml>

blockchain technology and available for transfers between Hong Kong and the Philippines in the first phase, has been reported to be able to complete the cross-border remittance within 3 seconds and at extremely low cost. The company claims that it aims to eventually reduce the cost of such remittances to near zero!

Although more alternative payment channels are emerging, SWIFT is still the most common channel for the cross-border payments. Under this more competitive environment, SWIFT rolled out the SWIFT global payments innovation (gpi) last year which allows the same-day availability and real-time traceability of funds in cross-border payments between the gpi-ready banks. According to SWIFT, "nearly 50% of gpi payments are completed and credited to end beneficiaries' accounts in less than 30 minutes, many within seconds". This is a big step forward in answering the calls of many corporates on shortening the time lag in remittance. To go one step further, SWIFT announced in April 2018 that riding on its gpi platform, it has teamed up with a group of banks in the Asia Pacific region to develop an APAC cross-border real-time payments system. A commitment of universal adoption of the gpi service by the SWIFT Community for cross border payments was made in June 2018. According to the plan, all the 10,000 banks in the SWIFT network can "offer same day end-to-end delivery with full tracking and transparency" by end of 2020⁹. Furthermore, in order to encourage wider adoption of gpi services in the corporate treasury arena, SWIFT brought together 22 corporates and banks in July 2018 to roll out a pilot programme and test the real-time payment tracking and gpi integration in ERP and TMS¹⁰.

The good news to treasurers is that we are being offered with more choices which are far better and cheaper than the traditional payment services and are getting closer to the payment utopia - transferring funds across countries in no time at minimal fee and with full transparency and traceability.

⁹ <https://www.swift.com/news-events/press-releases/swift-extends-gpi-to-all-cross-border-payments>

¹⁰ https://www.swift.com/news-events/news/swift_s-gpi-driving-real-time-payments-tracking-into-corporate-treasury-systems

KYC

Nearly every survey on treasurers' pain points in their daily working life, KYC always comes to the top 3 of the list. The frustration stems from the many unproductive hours spent on this laborious and paper-based process, with different banks carrying out very similar due diligence process over and over again. Worse still, different banks tend to have their own interpretation of the regulations with respect to the types of documents and information required for the KYC and onboarding processes. These variations are causing additional frustration to the clients.

The industry has been discussing the ways to synchronize the KYC requirements. In addition, some FinTech companies are attempting to address this pressing need by developing a blockchain-based solution which largely reduces the redundant works on the part of the banks and their clients. Being an immutable distributed ledger, the blockchain technology is able to produce a digitalized corporate profile with the complete KYC information as well as a full audit trail of the historical records which cannot be tampered with. Information stored in the blockchain can also be validated against the trusted sources and new information identified in the validation process will be updated to the blockchain.

Trade Confirmation

A pilot case has been reported successful by a European bank in making use of blockchain to capture a FX forward deal with its client. By doing so, it removes the need for reconciling the trade details by both parties which not only streamlines the post-trade activities but also dramatically reduces the operational risks by having the confirmation being done real-time. On the same rationale, an accounting professional firm is exploring the idea of "triple entry accounting" where companies engage in a business transaction record the transaction details in a blockchain-enabled joint register which becomes an interlocking system of accounting records instead of keeping separate records on each company's own book as what the current accounting practice is doing now. Since the third entry is cryptographically sealed and resides in a shared ledger, the entry can hardly be changed or falsified. As such, the

blockchain arrangement has the effect of having the transaction verified without the need for an independent third party authority.

Equity Clearing

The Australian Securities Exchange (ASX) has announced that it will implement a blockchain-based system to replace its existing system in 2020 Q4 - 2021 Q1 for clearing, settlement and asset registration. ASX expects that the new system will be able to improve record keeping, reduce reconciliation, allow more timely transactions and provide better quality data.

Robotic Process Automation (RPA)

RPA is a tool that makes use of software robots to handle those tasks that are voluminous, highly repetitive and rule-based, such as data entry, synchronizing data between multiple systems, data extracting and reporting, and so on. Those mundane tasks that were once performed by humans can now be performed by robots with greater accuracy, consistency and efficiency.

There are two major types of RPA: autonomous and assertive. The autonomous RPA bots usually sit in the corporate server and run automatically on predetermined schedule with minimal or no human intervention. On the other hand, an assertive bot is installed on local workstations and works more like a software assistant as it reacts and processes tasks only when being prompted or upon human-triggered events.

One of the key features of RPA is the audit trail it maintains for every action the robots have taken. This allows subsequent inspections and facilitates the reviews for workflow improvements. RPA can also relieve the skilled employees from the monotonous tasks and redeploy them to

the higher-value tasks which usually are appreciated by the highly educated staff members to whom job satisfaction is always emphasized.

Many companies consider RPA as a quick win and a low-risk automation project because RPA merely sits on top of other applications and requires no alteration in the current IT environment.

According to a global survey conducted by Deloitte in September 2017¹¹, 53% of the organisations in shared service, global business services and other administrative functions have been using RPA. It is estimated that within the next 5 years, the adoption rate will reach near 100%. On average, the payback period for the ROA investment was just below 12 months. The top 3 benefits witnessed by the users are improvements in compliance, quality/ accuracy and productivity.

Case Study : RPA - The Crown Jewel of a Shared Service Centre

Crown World Mobility (CWM) is part of the Crown Worldwide Group which has operations in almost 60 countries and employees of over 5,000. CWM provides the global expatriate relocation management services to many of the Fortune 500 companies.

CWM runs its global shared service centre (SSC) in Hong Kong, staffed with about 50 employees. “The key challenge of operating a SSC in Hong Kong is the dual pressure from mounting costs and staff turnover,” says *Alison Sim*, the Associate Director – Finance and Technology of CWM. Although the company has already achieved remarkable efficiency gain of 70% of one full-time equivalent (FTE) across a team of 5 by making use of Excel macro to automate some of the workflows, it is still not sufficient to offset that pressure.

After attending a conference in June 2017, Sim was enlightened by the concept of RPA and believed that it would be the way to go for removing the roadblock for further efficiency enhancement. While many organisations have taken the opportunity from automation projects to reduce headcounts, Sim emphasized

¹¹ Deloitte. “The Robots Are Ready. Are You?” November 2017.

that “this has never been an objective in Crown’s RPA initiative”. “We understand how important job security is to our staff and haven’t sacked any single one of them due to the implementation of RPA,” Sim added. “Our goal is clear – it is not to get rid of the people but to take away the most boring and repetitive tasks from the team’s daily work and let the bot handle those tasks”. In Crown, this message has been firmly cascaded down from the top to all the employees concerned. At the same time, staff members are encouraged to be more adaptive and embrace the unavoidable changes brought by technological advancement. In fact, the adaptability and agility required in the FinTech era are best exemplified by Sim herself who is a pharmacist turned business-transformation specialist.

Sim has given a few tips to companies which will be embarking on their RPA journey. First of all, review the existing process to identify workflows that can be rationalized or needs to be adjusted for automation. Don’t assume that the processes have to be automated as it is. Indeed, in most circumstances, it should not be the case. “RPA doesn’t fix inefficient process, human does,” says Sim. Secondly, document the workflows as detailed as possible. Sim said that Crown’s RPA project team has recorded the work steps down to the “which-button-to-press” level. Thirdly, as part of a Business Recovery Plan, be prepared to revert to manual mode in case the robot breaks down. Finally, involve your IT Department early on and throughout the project. Sim explains, “in Crown, we treat RPA as a business-leads-and-IT-participates project”.

Crown’s RPA software went on live in mid-2017 after a four-week trial period. “Our team members are very pleased after the pilot automation project because they can now engage in the high value-added tasks while robots take over the lower ones. It is definitely a boost to the morale,” Sim says. According to Crown’s assessment, the RPA investment has been fully paid back within 8 – 9 months. However, some of the added benefits are not entirely quantifiable. “The higher job satisfaction and lower turnover rate are obviously seen, but they are not easily measured in monetary term.” Therefore, Sim stressed that people focusing only on the payback may lose sight of some equally important benefits gained from a good RPA project.

In fact, Crown’s pilot RPA project is so successful that three new bots have followed – two in the SSC and one at the enterprise level. The way that CWM has introduced new technology to its operations shows that, if managed properly, automation does not necessarily create a win-lose scenario to the firm vs. employees. A win-win situation is entirely possible and achievable.

Open API

If RPA is the transformation from within, then open API is the external force that will reshape the entire banking landscape and their services to corporates.

Application Programming Interface (API) is a standardised protocol for systems to connect and communicate with each other in a controlled yet seamless fashion. Regulators of most of the major financial centres have set out policies to encourage or require banks to open up, by phases, the data of their customers, upon their approval, to the approved third parties in order to push for more competition. This means that the fortress enclosing the banks' monopoly on the data assets is to be taken down. To view it from the constructive perspective, banks as the incumbent in this space, will still benefit from new revenue sources arising from innovative products if they can proactively lead the game or collaborate with the FinTech firms.

A treasurer has commented that the open API will create a whole new ball game for banking services. First of all, it allows the aggregating of bank balances across different banks to be done in a much more efficient and cost-effective way. Besides, with banking information available more easily and in a more consistent format, the comparison of products and costs will no longer be a formidable task. It will also substantially lessen the burden of system interfacing for the treasury management system to connect to each bank's system. One can also expect that by opening up the market to the FinTech firms, more innovative products will emerge in the near future.

Smart Contracts

“Smart contract” is a term created by Nick Szabo, a legal scholar and cryptographer, in 1994. Smart contract is a self-executing programme which is written and stored in a blockchain. The programme is able to automatically verify the pre-defined conditions programmed in the smart contract. When the conditions are met, the smart contract will process

the transaction and enforce the obligations of the contracted parties. Riding on the unique strength of blockchain, smart contract serves as a perfect tool to exchange assets of value in a transparent, tamper-proof and unambiguous way without the need to involve any intermediary, e.g. lawyer, broker or bank.

There are already some cases of smart contracts being used in the business world. A German utility company, together with a startup, have created a new model for providing electricity to the electric vehicles. By using a specially designed plug which has an identification code, a car owner can plug in at one of the many charging stations and authorize the charging through the app on his smartphone. The blockchain behind the system is in charge of the recording of the charging data and arranging payment by using smart contract.

Smart contract is particularly easy to fit into the insurance domain. A major European insurance company has launched a flight-delay insurance governed by smart contract which will process the claim and compensation process automatically if the flight is delayed for more than 2 hours. The payout will be transferred to the account of the policy holder without any action taken by him.

A major technology firm is developing a system to handle the payments of syndicated loan by the smart contract technology and digital token on a private network. Since syndicated loans always involve 20 to 30 participating banks, automating the payment leg will reduce tremendous workload in matching and reconciling cash payments.

Apart from the loan market, smart contract has also found its way into the bond market. The conventional way of issuing a bond is through a book-building process in which the investment bank goes out to the market, find the interested professional investors and take their orders to “build a book”. The information flow in this process is basically controlled by the arranging bank and is not entirely transparent to the issuer. A new concept leveraging on smart contract has been introduced. Within the smart contract, the key terms of the bond, e.g. tenor, coupon, payment interval, will be clearly described. Investors interested in the bond will

place orders with indication of their acceptable coupon level. After the cut-off time, the smart contract will allocate the bond based on the lowest acceptable coupon that can absorb the full amount of the bond. The remaining payment and refunding processes will be automatically executed by the smart contract. In February, a smart social impact bond was issued in South Korea by way of smart contract. Last year, a major car manufacturer in Germany successfully tested the potential of blockchain for a corporate "Schuldschein", a privately placed bilateral loan governed by German law.

Another important market to treasury is the derivative market in which the over-the-counter transactions take place. ISDA, the industry association that develop the ISDA Master Agreement, has announced a plan to reshape the derivative markets by using the latest technology of distributed ledger and smart contract in order to increase the degree of automation and efficiency of the markets. To make it possible, a common set of process and data standard must be established first in order to create "a truly automated and interoperable trading and post-trade environment". Hence, ISDA has engaged in the development of the Common Domain Model which will "set out the required elements to achieve a single digital representation of trade events and actions"¹².

Artificial Intelligence (AI)

There is no universal definition of AI. In the "Artificial Intelligence and Life in 2030" Report¹³ published by Stanford University, this term is defined as "a science and a set of computational technologies that are inspired by the ways - but typically operate quite differently from - people use their nervous systems and bodies to sense, reason, and take action". This definition has captured the essence of the AI technology.

¹² ISDA Press Release "ISDA Publishes Common Domain Model Concept Paper as First Step to Realize Potential of New Technologies". 17 October 2017. <https://www.isda.org/2017/10/17/isda-publishes-common-domain-model-concept-paper-as-first-step-to-realize-potential-of-new-technologies/>

¹³ Peter Stone, Rodney Brooks, Erik Brynjolfsson, Ryan Calo, Oren Etzioni, Greg Hager, Julia Hirschberg, Shivaram Kalyanakrishnan, Ece Kamar, Sarit Kraus, Kevin Leyton-Brown, David Parkes, William Press, AnnaLee Saxenian, Julie Shah, Milind Tambe, and Astro Teller. "Artificial Intelligence and Life in 2030." One Hundred Year Study on Artificial Intelligence: Report of the 2015-2016 Study Panel, Stanford University, Stanford, CA, September 2016. Doc: <http://ai100.stanford.edu/2016-report>. Accessed: September 6, 2016.

“Just as electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don’t think AI will transform in the next several years.”
Andrew Ng, Adjunct Professor at Stanford University

Although AI is still in the early stage of deployment in business, it is set to transform many aspects of business management, including treasury. With AI, we will witness abundant latent potential productivity which will be unleashed because the limitation on capability to handle the astronomical amount of data and identify the seemingly uncorrelated pattern between numerous factors will no longer be an issue. The emergence of the cutting-edge AI techniques, such as machine learning and deep learning, will further equip the machines with the ability to make predictions or decisions, similar to (or even superior than) human being and with a high level of accuracy.

One of the examples of using AI in treasury is reconciling incoming remittance with invoices. This task is always time-consuming, especially when the remittance information is incomplete or received separately from the payment. In such a case, AI can be deployed to identify the unmatched items and automatically extract supporting data from other sources, such as email or email attachments, to complete the matching. It can even send out automatically generated emails to the payer requesting for more information in relation to the payment. AI is able to learn the payment pattern and behavior of each customer and apply this intelligence in future matching.

AI can also be used in credit assessment which is a critical success factor to business selling products to a large number of customers on credit. To this end, an AI-enabled credit scoring engine can be constructed to analyze each individual customer’s credit profile to decide the appropriate credit terms and predict the probability of late or default payments. Such information will be valuable to liquidity projection and working capital management.

It is important to note that the above technologies are not completely discrete and mutually incompatible. We may see that some of these technologies will be converged or combined in certain applications which can achieve a higher level of performance than they are deployed alone. For example, some startups are working on the techniques of building algorithm for AI to process the data that are in encrypted state and securely stored in blockchain.

The Changing Dynamics in Banking Relationship

Treasurers should also be prepared that technology could potentially shake up the long-established working model between corporates and their relationship banks.

With the advent of the technology firms in the FinTech universe, treasurers may soon find that some of these firms are able to offer products that can fill the gaps between existing banking services and treasurers' higher expectations.

For most treasuries, the bank (including commercial and investment banks) is the single channel for the majority, if not all, of the needed financial services - from cash management, loan and deposit, trade finance, forex, hedging, remittance, bond issuance to M&A advisory. With the advent of the technology firms in the FinTech universe, treasurers may soon find that some of these firms are able to offer products that can fill the gaps between existing banking services and treasurers' higher expectations. Those gaps could be related to efficiency, charges, convenience, connectivity, transparency, timeliness, traceability, visibility or innovative ideas.

Without the complex hierarchical organizational structures and the legacy IT systems, these technology firms are usually more nimble in leveraging the latest technology to offer solutions to specific business - requirements. Nevertheless, banks still have an upper hand on trust and scale due to their longer history in business and being under the close supervision by regulators.

In a paper¹⁴ assessing how FinTech may affect the banking industry and the activities of supervisors, the Bank for International Settlements has set out five possible and non-mutually exclusive scenarios that the future banking may evolve into under the impact of FinTech:

¹⁴ Bank for International Settlements. "Sound Practices - Implications of fintech developments for banks and bank supervisors." February 2018. <https://www.bis.org/bcbs/publ/d431.pdf>

- a. The “*better banks*” which adapt to the new technological environment by digitalizing and modernizing the client interface. Through the continuous improvement on services and products, they manage to retain the direct relationship with the customers.
- b. The “*new banks*” which are the challengers equipped with the advanced technology to provide more innovative services and redefine a digitalized relationship model with customers.
- c. The “*distributed banks*” which usually partner with FinTech companies in different ways, e.g. joint venture. Banks are open to offer products and services from themselves or third parties. At the same time, consumers may no longer stay with the single banking partner model.
- d. The “*relegated banks*” which retreat to become “*commoditized service providers*”. The FinTech and “*bigtech*” companies make use of AI, big data and cloud computing to construct the front-end platforms to elevate the customer experience on banking to the next level.
- e. The “*disintermediated banks*” which are the FinTech and bigtech companies providing the direct matching service to consumers and users on the both side of the financial transactions. The incumbent banks are displaced because the technology is already able to take their place for the traditional banking functions.

Hence, it is not unrealistic to believe that, in the not-so-distant future, treasury may work in a bimodal for sourcing financial services in which banks will still play a role as the product and credit providers. But the technology firm is a new alternative channel for certain services or products for their competitiveness or creativity. In addition, they can also be a platform provider for distributing products from different banks. This business model has been proven to be receptive in the B2C market.

Recently, banks have been investing heavily on AI and business analytics to extract values from the vast amount of transactional data they possess to uncover insight and identify trends on industries, business segments and individual customers. Technology allows the bankers to gain a panoramic view on corporate clients’ business and thus can better serve them with the relevant services that address the clients’ most imminent needs. Some companies may find that their bankers could understand

their companies' business and the sector that they belong to, even better than they do.

On the other hand, under the tremendous pressure on profit margin, it would not be surprising that some banks will favour more in segments and clients on which the advanced analytics predicts greater prospect and profitability. Consequently, resources and credit support may be reduced and shifted away from the less promising accounts. This will then gradually change the dynamics in the customer-banker relationship.

Treasury in the FinTech Era

Within 3 to 5 years, the costs and ease of implementation of the technology solution will be so appealing that no treasurer can afford to ignore it.

Currently, digitalization may still not be the mainstream in many of the treasury processes. Plenty of time and resources are consumed by the tedious and repetitive tasks e.g. soliciting FX quotes by telephone, moving transaction data from one system (or spreadsheet) to another, compiling documents to satisfy KYC and AML requirements, sending paper-based deal confirmations, identifying irregular payments, preparing variance analysis reports, monitoring loan covenants, etc. In fact, technology of today is already fully capable of taking over these types of tasks. Within 3 to 5 years, the costs and ease of implementation of the technology solution will be so appealing that no treasurer can afford to ignore it.

At the same time, with the advent of the faster payment system and significant progress of other payment technology, a full-scale global network of real-time payment and settlement for enterprise use is on the horizon. A significant increase in the velocity and volume of the cash flowing through bank accounts is almost certain. Without resorting to technology, it will be hard to cope with a new landscape of cash management in which the transactions will be happening at lightning speed and at 24/7.

While technology brings tremendous benefits in terms of innovation and productivity, it also causes concern on whether the digital workforce will cannibalize the human staff. According to a report published by the World Economic Forum¹⁵, over the period 2015-2020, a total of 7.1 million jobs will be lost. However, this figure will be partially offset by a gain of 2 million new jobs. Majority of the jobs lost are concentrated in the routine white collar office functions. In a sense, technology does not wipe out jobs entirely; but it changes the nature of jobs and reinvents them.

In a recent research published by McKinsey¹⁶, 39% of the activities in Treasury are either fully automatable or highly automatable as compared to 89% for general accounting operations, 57% for tax and 56% for financial planning and analysis. Some examples of those automatable tasks are:

"preparing wire-transfer requests"

"building standard management reports"

"performing and documenting account reconciliations"

"consolidating and validating budget and forecast inputs"

"gathering and cleaning data for analysis"

Another research conducted by EY¹⁷ has suggested an even higher possibility of automation in finance. Amongst all the finance functions, accounting, tax and financial reporting & controls are most exposed to automation technology - with about 94-97% of works potentially subject to automation. For cash and liquidity management, a higher level of

¹⁵ World Economic Forum. "The future of jobs: Employment, skills and workforce strategy for the fourth industrial revolution". January 2016.

¹⁶ McKinsey Global Institute. Frank Plaschke, Ishaan Seth, and Rob Whiteman. "Jobs lost, job gained: workforce transitions in a time of automation". December 2017.

¹⁷ EY. "The Future Workplace: How to Automate Intelligently".

<https://betterworkingworld.ey.com/workforce/how-do-you-ensure-you-are-automating-intelligently>

human involvement will still be required. However, the estimated “automatability” ratio remains high at 55%.

If the world development lives up to these predictions, all of us working in the treasury profession will have to prepare to shift gears by changing our mindset to embrace a human-machine working relationship and acquire the new skillsets required under the new technological environment.

If a treasury is to embark on its journey to transform itself into a technology-enabled operational model, here are a few points of recommendation:

Process Re-engineering : Review the existing processes of all the key treasury functions and identify the "quick win" for automation. Those should be the manual works that are repetitive, error-prone, rule-based and require no human judgement. In most cases, automation is a gradual process to be done by stages and RPA will more likely be the technology deployed at the beginning of this journey. It is not uncommon to find that some of the existing workflows may not be able to integrate seamlessly or become redundant in the RPA operating environment. Therefore, the entire workflows should be reviewed holistically during the planning stage and map out those parts that required re-engineering in order to ensure a smooth operational environment and maximum efficiency after introducing automation into the process.

Talent Strategy : The treasury team will have to adapt to the new operating environment in the FinTech era. First of all, levelling up the team's technology literacy is crucial. It is becoming more common for conducting FinTech projects by using the DevOps approach which brings together the development team and operations team to form a unified project team for the purpose of accelerating the application's build-test-and-release lifecycle. Therefore, treasury will play an increasingly important role in future FinTech-related projects.

The more advanced treasury handling complex operations may even consider a headcount for FinTech analyst who does not need to be a seasoned programmer or an AI expert. However, he or she has to be equipped with sufficient basic knowledge in data analytics, DLT, API, algorithm and AI so as to act as the technology champion within treasury as well as the interface between the human treasury team and the machines.

New Collaboration Model : In the wake of the FinTech revolution, the force of disintermediation has changed the dynamics in the financial services industry. The agility and innovation DNA of the technology firms have empowered them to gain grounds in many products and services that used to be the sole domain of banks. We should not rule out the possibility of getting the technology firms on board if they are proven to be having the edge in some specialty areas of service. Treasurers need to keep abreast of the niche players in the FinTech space and may have to think ahead in the collaboration model with these firms. The model should include a business continuity plan to mitigate the higher operational risk arising from working with the newcomers.

System Readiness : Make sure your treasury management system and e-banking platforms can deliver on your vision on digitalization. API is a key enabler in the automation process. As mentioned before, API allows real-time access to reliable bank account data and the transfer of those data in a secured and standardized format. Therefore, it is important to ensure that the systems that you are using are API-ready. If the system is not ready at the moment, the vendors shall provide you with a clear plan and timeline to upgrade the system into the API-ready version.

Roadmap : Automation leads to greater efficiency. But to bring treasury management to the next level of sophistication, treasurers will have to resort to the more advanced technology, such as AI. Therefore, a road map to revolutionize treasury to an AI-enabled operation should be in the treasurer's long-term strategic plan. The roadmap shall, however, align with the business needs and the corporate-wide technology strategy.

Exhibit 2

11 Questions to Ask in Preparing Treasury for the FinTech Era:

- 1) Do you have a FinTech strategy for Treasury and the plan to enhance the degree of digitalization in the treasury operations?
- 2) Does your relationship bank have FinTech strategies that align with yours so that they can become your strategic partners in your FinTech journey? In which aspects are the tech firms better positioned to fill the gap?
- 3) Is your treasury management system ready to facilitate the API connectivity for data flows with banks and third party service providers?
- 4) What needs to be changed in terms of system and workflows if Treasury is to benefit from the new payment channels and technology?
- 5) What are the data available in Treasury and other departments within the organisation which will be useful for AI predictive analytics with respect to cashflow, capital requirement, debt level, foreign exchange and interest rate exposures and credit risk?
- 6) Which FinTech solution is best suited for streamlining the KYC and onboarding process?
- 7) What is the level of readiness in deploying DLT to post-trade processing and trade finance?
- 8) As many countries are moving toward a cashless society, how ready is Treasury in adapting to the digital payment methods by customers?
- 9) The faster payment system (FPS) will allow payments to be sent / received in real time, 24 hours a day and 7 days a week. With such a change on the speed and operational hours of FPS what kind of corresponding changes are needed in terms of operational procedures and resources ?
- 10) With the proliferation of new cross-border transfer platforms, which one is suitable for your business to replace or supplement the existing one?
- 11) Does your team have the mindset and skillsets to adapt to a new operational model in the FinTech era?

In conclusion, we have to be cognizant that this wave of technological development is fact and not fiction. The ubiquity of technology in treasury will soon become the new normal. It is wiser to start this reform by choice rather than being forced to. Always think ahead and resolve today's problems with the future technology in mind. At the end of the day, we want to come out from this FinTech transformation as a victor rather than a victim of change.

ACKNOWLEDGMENTS

I am greatly indebted to the following friends and colleagues who are kind enough to review the drafts of this whitepaper and have shared their views and advice which are invaluable (*in alphabetical order by surname*):

- Lin KAN, Managing Director, Asia Treasury Community (ATC)
- Gogo KO, President of IACCT (China), Deputy General Manager – Finance Department, Yue Xiu Enterprises (Holdings) Limited
- Allen LEUNG, Board Member of IACCT (China), Senior Manager, Treasury – Asia Pacific, AECOM
- Peter WONG, Founding Chairman of IACCT (China), TMA Executive Board Member and Executive Director (Transaction Banking) of Standard Chartered Bank (Hong Kong) Limited

I would also like to express my gratitude to Alison SIM, Associate Director – Finance & Technology, Crown World Mobility for her generous sharing of Crown’s RPA experience in the case study of this Whitepaper.

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