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THE COUNCIL ON EMERGING MARKET ENTERPRISES



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BUSINESS IN THE
GLOBAL CONTEXT



WELCOME

The past year has not always been a good one when it comes to our relationship with technology. With Facebook, fake news, concerns for data protection as encapsulated in the EU's GDPR, worries about the size of the digital giants, fears about a future governed by artificial intelligence, trust in our digital ecosystem has taken its fair share of hits.

But underneath it all, alongside the trepidation, there is both hope and optimism in what the so-called "fourth industrial revolution" can deliver. Technology still has the potential to transform the world in positive ways both big and small.

Technology's capacity to be a change agent is the underlying theme of this inaugural volume of the *CEME Journal*. The articles in this volume have been written by Senior Fellows who are key members of our Council on Emerging Market Enterprises (CEME) at Fletcher. The Council serves as a repository of expertise on issues that are at the intersection of the world of business and the world and represent perspectives cutting across industries and geographies. The articles explore how technology can make a difference in the world of 2018 and beyond, to examine "Digital Goods for Digital Good."

In this volume, our Senior Fellows explore several inter-related topics: digital trust from the macro—the ever-changing relationship that users have with innovative technologies—down to the micro—how the semiconductors, at the heart of the computing ecosystem, can lead the way in ensuring security; cryptocurrencies and what their future means for central banks and governments around the world; information access and how it shapes what we think and how we behave; FinTech innovation and its global reach. By looking across such a broad landscape, we have a better appreciation for technology's evolving impact on lives and livelihoods.

The "emerging market enterprises" that we study and discuss as part of this Council cover many entities that are experiencing change, from nations that fit with a profile of high economic growth to markets or sectors that represent the innovative and risky intersections of business and a broader global context. The need to understand the relationships among humanity, markets and technology and the potential to "do good" that resides at the intersection are the reasons why this volume is so timely.

We hope you read the pieces from these thinkers and doers, think deeply about their questions, and join the conversation with your own perspectives, data, and ideas about the future.

Sincerely,



Bhaskar Chakravorti

Dean of Global Business, The Fletcher School, Tufts University
Chairman, Council on Emerging Market Enterprises
Executive Director, Institute for Business in the Global Context



BANKING ON CRYPTO? CAVEAT EMPTOR

by Patrick Schena

Global interest in cryptocurrencies such as Bitcoin and Ethereum, has surged as coin prices soared and new coin offerings have expanded dramatically. Once the realm of technophiles and speculators, cryptocurrencies seem to have started down the path to “mainstream.” Pooled and derivative products, such as index funds and futures contracts, have emerged offering some relief from extreme daily price volatility, ranging from 3% to 8%. Similarly, initial coin offerings (ICOs) have extended the currency “use case,” emulating other more established forms of fund-raising. Despite the progress, core challenges leave behind a large moat between crypto and the core functions of fiat currencies. High volatility makes them poorly suited as a store of value, while access, scale, and lack of legal tender-status inhibit their utility as either a medium of exchange or a unit of account. Moreover, broader concerns raised by cyber risks, price manipulation, and the carbon footprint generated by the high energy consumption of some block validation protocols all work to obscure the “mainstream” path.

Financial product development built on cryptocurrencies is a key to overcoming scale constraints and coaxing larger institutional interest in crypto-assets. However, here too significant barriers remain. Currently fund products are accessible only to qualified or accredited investors with sufficient capital to weather price and operational risks. Asset owners and institutional investors, including pension funds, sovereign wealth funds, and endowments, have opted out primarily because crypto-assets are not tangibly backed, have significant drawdown or downside exposure, lack sufficient custody arrangements, and, certainly not least, are exposed to regulatory uncertainty.

How then will governments and their central banks respond? Will they clear the mainstream path, set up roadblocks, or rather detour cryptocurrencies to a transparent, secure, and more scalable highway? The solutions and innovations adopted in response to this question hold the key to the future of cryptocurrencies. First, however, governments and central banks must earnestly confront disruption paralysis to overcome the inertia and reactivity that have resulted in fractured or failed starts. This includes 1) defining a national digital currency strategy to inform the regulatory process and 2) clearly distinguishing monetary policy objectives from other strategic opportunities facilitated by a wider adoption of blockchain technology. The devil, of course, remains in the details with potentially disintermediating effects that could leave the fate—and the prices—of even the largest market cap cryptocurrencies hanging in the balance.

Certainly, proposals and programs abound. The Brookings Institution catalogs at least 29 separate government initiatives linked to crypto or central bank digital currencies (CBDC's). These range from the implementation of digital payment systems to the introduction of digital or e-money to the issuance of sovereign cryptocurrencies, in some cases parsing the traditional functions of money—e.g. value vs. payment—to address specific national objectives. They are also distinguished

as much by their frailty as by their diversity. In Estonia and Russia, for example, initiatives have circulated to create respectively the “estcoin” and the so-called “CryptoRuble.” In Estonia, which uses the Euro, the estcoin initiative was recently downplayed by a government spokesperson, while in Russia, Vladimir Putin himself dismissed the prospect of issuing the CryptoRuble. In Switzerland, a broad-based campaign to reform the Swiss monetary and banking system through the issuance of “sovereign money”—Vollgeld—brought the matter to a national referendum. The Swiss National Bank lobbied hard against the initiative, which ultimately managed to secure only 26% of the vote. In Venezuela, hardly a model for monetary stability or policy innovation, the “Petro,” a “cryptocurrency” backed by petroleum reserves, was created to function not as a national digital currency, but rather as a sovereign initial coin offering designed to provide the government with access to new capital. In recent weeks, the Petro has been linked to attempts to restructure the Venezuelan Bolivar, which has been racked by hyperinflation.



The Marshall Islands have been a surprise early mover in state-issues cryptocurrency

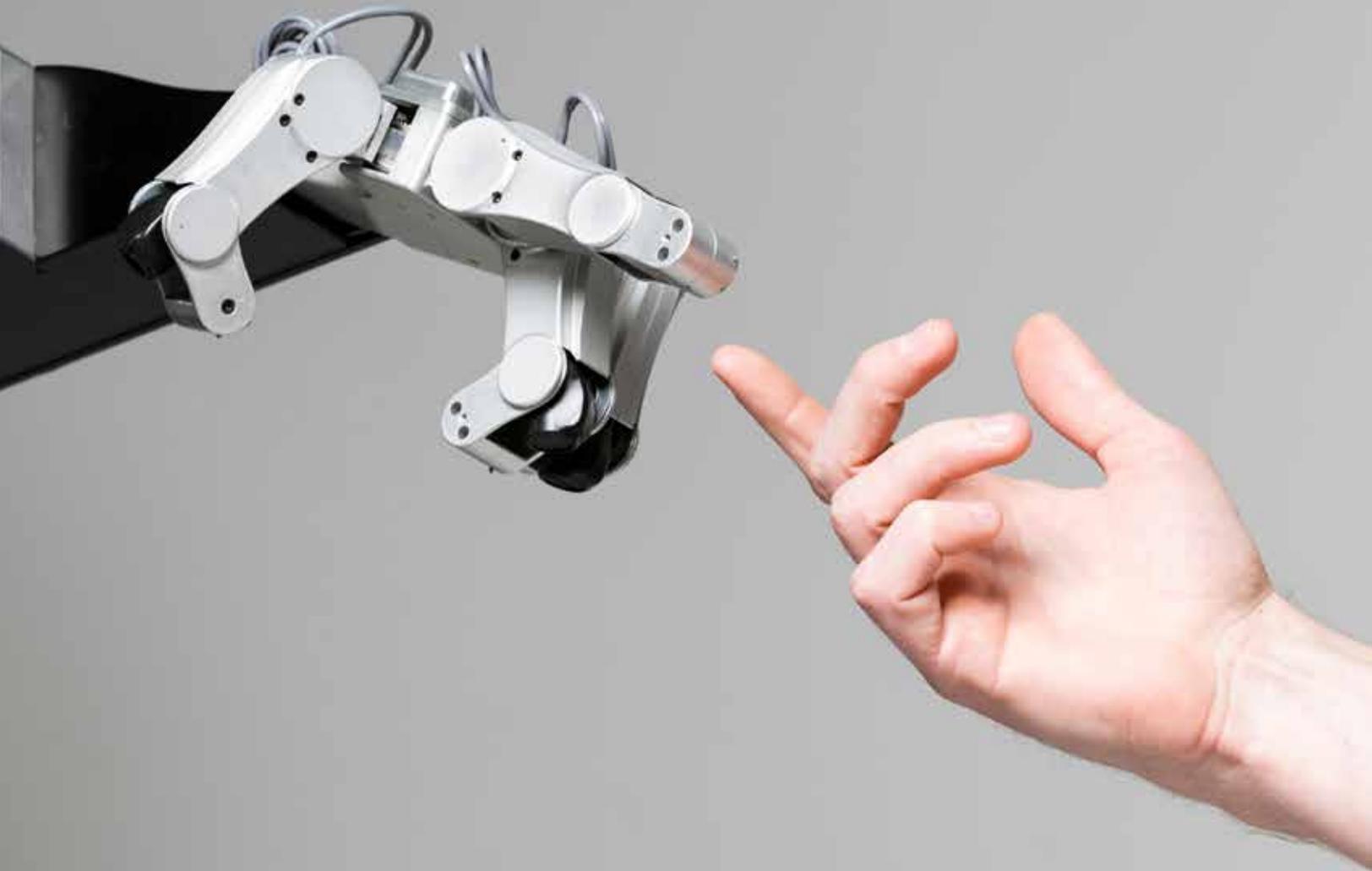
Where then to look for innovation? ...the Marshall Islands? The RMI—population 75,000—became independent of US administration in 1986, but continued to use the US Dollar as a national currency. In February 2018 RMI issued a currency law introducing a cryptocurrency—the SOV—as legal tender in the island nation. The SOV is a true cryptocurrency that is issued on distributed ledger technology (DLT), i.e. blockchain, using a unique, permissioned protocol that appears to overcome several of the discrete challenges of cryptocurrencies launched on public, permissionless networks. Users must undergo “know-your-customer” prescreening and be issued an identity token, which identifies them to counterparties. Thus, transactions are “private,” but not “secret.” Is the SOV the new baseline? Hardly. The RMI suffers from high unemployment, low digitalization, and is threatened by climate change. Certainly, questions will remain as the SOV scales even over a tiny population. Yet, perhaps it can serve to inform the continuing work of governments and central banks, most especially, as they leverage DLT to reassert the sovereign role of the state over “money.”

The disruption of blockchain does not, however, rest exclusively in the monetary sphere. More broadly, blockchain use cases extend deeply across industries, including financial services, with potentially transformative affect. When applied to custody services, for example, they offer the potential to significantly increase interoperability and standardization, while reducing the risk and increasing the speed of clearing and settlement processes. This places authorized, i.e. permissioned or private, implementations of DLT squarely at the cusp of the evolving global capital market infrastructure. It is here too that governments, through their sovereign investment vehicles—such as Singapore’s Temasek—have placed their bets.

To date many governments, central banks, and indeed sovereign wealth funds have eschewed a discrete role in markets for cryptocurrencies—whether as investor or even regulator. When and how they do will have very real consequences for the future development of crypto assets and their values. Caveat emptor...

Patrick Schena is Adjunct Assistant Professor of International Business Relations at The Fletcher School, where he is also Senior Fellow of the Council on Emerging Market Enterprises and Co-Head of SovereignNet. In addition, he is an Associate-in-Research at the Fairbank Center for Chinese Studies, Harvard University.

Schena has 30 years’ experience in finance, operations, and technology management focused on investment management. He was formerly a Principal, leading delivery of the Investment Management Services practice at a Genpact-Headstrong Corp. He holds a PhD in from the Fletcher School and additional graduate degrees from The Fletcher School and Boston College.



LEAP OF FAITH: REIMAGINING THE RELATIONSHIP BETWEEN TECHNOLOGY AND HUMAN UNDERSTANDING FOR A FAST- CHANGING WORLD

by Ajay Bhalla

As technology outpaces the human mind what are the consequences for our understanding? How do you trust a world you may not fully comprehend? Mastercard's Chief Security Solutions Officer, Ajay Bhalla, writes about trust in a future where we may all be more passenger and less driver.

If life's a journey, then in 2018 we're traveling by roller coaster.

The future exhilarates and surprises all of us. Sometimes there's a glimpse of the twists and turns ahead. Other times we have no idea what's around the corner. Technology is constantly rerouting the track ahead.

These changes are unprecedented. They challenge our ability to comprehend. Human understanding of the world developed slowly, incrementally. Thousands of years separate the invention of the wheel, the creation of the alphabet, and man's first flight. We had time to adapt, learn new skills and acclimate ourselves to change.

Yet the internet is little older than a college graduate. The iPhone is younger than my children. Uber isn't even out of elementary school, and blockchain is still in diapers. These technologies have either already changed the world, or are in the process of doing so.

The rate of invention will accelerate, too. The American thinker Richard Buckminster Fuller created the "Knowledge Doubling Curve" in 1982. He noticed that until 1900, the body of human knowledge doubled about once every 100 years. By the end of World War II, knowledge was doubling every 25 years. On average it's now taking a year, and the imminent explosion of device connectivity promises to cut it to weeks, days and even hours.

This is great. It is bringing us advances in medical science, new cures, solutions to climate change, and a massive democratization in access to information. But it has created more noise too. Fake news, internet memes, disinformation, and confusion. **Sometimes it feels like we have gained data, but lost focus.** People are feeling as unsettled about change as they are dazzled by it.

Our response to this should be to engender trust. Each day we are asking people to take a leap of faith in technology. Maintaining that faith means setting standards, rules, and protocols for the technologies we are creating. Machine learning is just the start of a process by which the world will be shaped not by us, but for us. At the moment we are in direct control. We are active participants

in the digital revolution. We operate our apps and mobile devices, we communicate through social media, and we make real time decisions about how to spend our money. But in future the world will feature fewer human decisions and far more automated, autonomous, and robotic ones. We're witnessing an explosion in connected devices—50 billion anticipated by 2020. In this Internet of Things, machine speaks to machine. We'll trust our fridge to tell our online retailer what groceries to deliver, allow the smartphone tapped on a subway turnstile to tell our heating system what time we'll be home, and the weather forecast will operate our garden sprinkler system. Today we consult machines in order to make our decisions. Tomorrow they will consult each other in order to make theirs. But responsibility for the decisions remains with the human race.

Take the example of autonomous vehicles. When people finally decide to trust them, it won't be because they have each taken the vehicles apart, examined the technology, read the code, and concluded it is safe. It will be because they are confident that the technology is proven, the intelligence is secure, the rules have been written and standards defined. They will decide that the benefits outweigh the risks.

Trust is a currency. It has value. And it needs to be earned. People may trust companies with their data, for example, but they cannot take that trust for granted. Look at the damage done to Facebook recently. Billions upon billions of dollars wiped off the value of the company. Trust appears to have been breached and at considerable cost.

Part of restoring trust may be in returning digital identity to the individual. We are seeing an important shift in this direction. Think of your digital identity as a wallet which contains lots of identifying information. At the moment different elements of that information lie on different servers with different institutions and retailers. But in future you will be able to decide which element of verified data you produce from your wallet, without having to share other data relating to your identity. So, for example, if asked for proof that you're over 18, you'd be able to confirm that without having to give your date of birth.

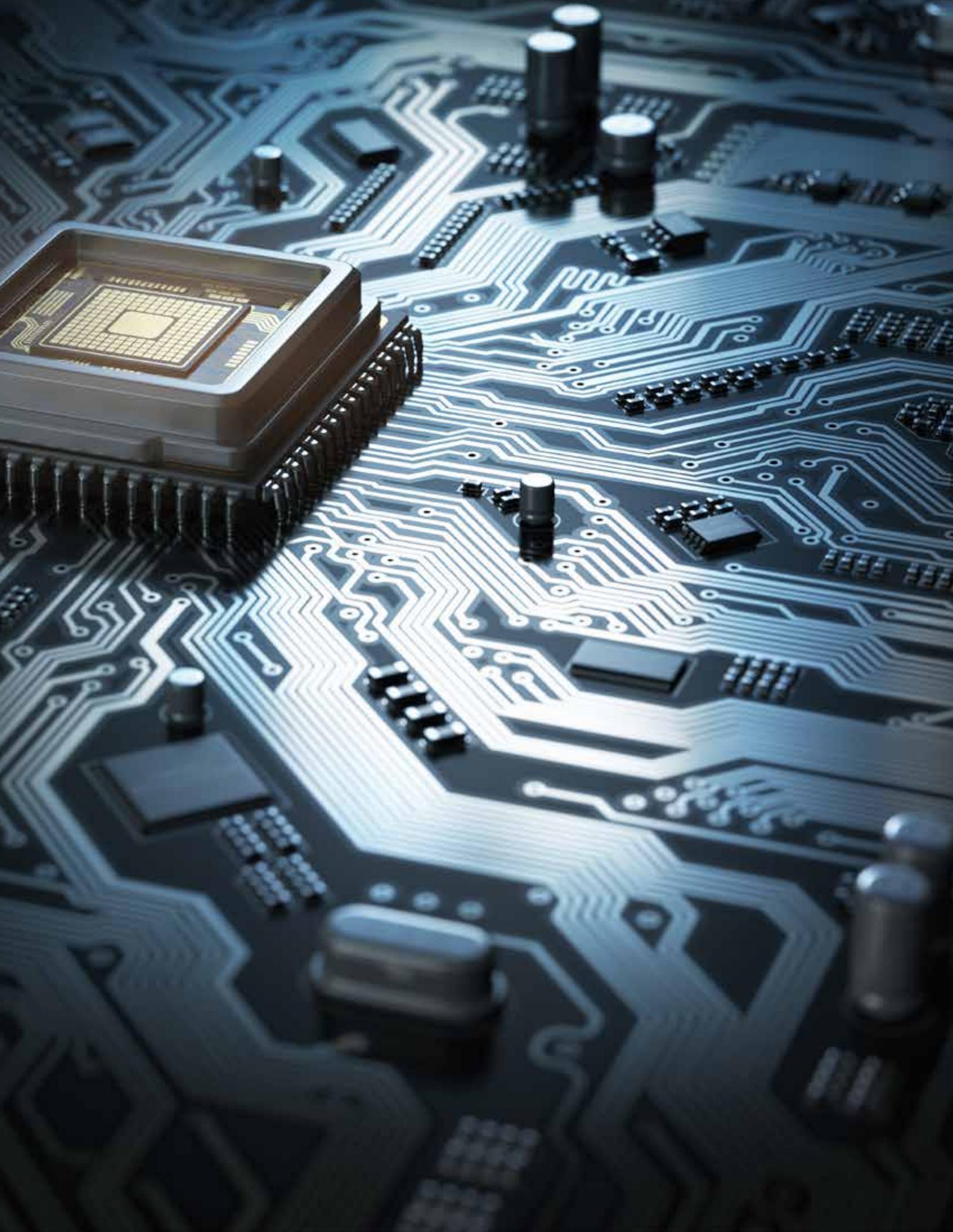
Trust has long been the bedrock of our business at MasterCard. We are moving towards frictionless technology, but not at the cost of vulnerability, and not without rigorous standards. We're partnering with appliance manufacturers to embed our trusted technology in connected devices. We're encrypting and tokenizing payments. We're replacing the password with the person: using biometric measurements such as fingerprint, voice, facial, and iris recognition and using behavioral metrics to pre-empt and stop fraud. As others gain access to such technology, so we will create a more trusted environment.

This is why we value our partnership with the Fletcher School. For a decade we've worked together to develop a better understanding of our digital future, most recently with the publication of the Digital Evolution Index. If you haven't read it yet, I recommend that you do. It demonstrates just how important trust will be when we take a leap of faith to the next level of connectivity.

The way we think and do business is changing. For my generation, progress was secured through competition. But for the next generation of leaders, the answer can only be collaboration.

The leap of faith shouldn't be blind. It needs to be informed by trust and collaboration.

Ajay Bhalla is Chief Security Solutions Officer at MasterCard. He leads the team within MasterCard that develops product solutions to ensure the safety, security and experience of our products and solutions for consumers, merchants, partners and governments around the world. His work with IBGC has included authoring articles alongside Dean Bhaskar Chakravorti as part of the Digital Evolution Index.



CHIP-BASED TRUST FOR THE DIGITAL GOOD

by Terry Daly

Digital technologies are accelerating and transforming every aspect of society from business, finance and government to personal productivity, entertainment, education, health care and transportation. But toward what end? What is the critical factor in determining whether this transformation will result in a net good for society, and not simply for the advancement of technology and corporate profits? Trust—in the security of information in products, and in the use of digital products across the connected world—is at the nexus of societal progress and the pace of adoption of technology, determining the growth rate of the industry itself. Technology companies have a responsibility to society beyond delivering product innovation; they must deliver Digital Trust. The semiconductor industry, the foundation for innovation up and down the technology stack, bears a special responsibility for leadership in delivering Digital Trust.

At its core, digital technology is a combination of bits (the digits “0” and “1”) to represent words, numbers and images. This allows for the manipulation, compression, storage and transmission of voice, data, and video at lightning speed and very low cost. A complex ecosystem of data centers, networking and communications infrastructure and high-performance computers have evolved to deliver powerful platforms for companies to innovate and improve the quality of life for people worldwide, including a broad array of applications in fields of social media, e-commerce and the sharing economy. Think Amazon, Facebook, Uber, Google and Netflix.

But with progress comes risk and downside. There are many bad actors in society with the means, motive and opportunity to leverage digital technology for more nefarious goals. What is at stake? For starters, privacy of personal information (high visibility hacks of Yahoo and Equifax), economic security (ransomware attacks against hospitals, corporations and individuals), and trust in historic pillars of society (media and government—what news is real?). Going forward there are deep concerns regarding the security of critical infrastructure (power grids, the internet), highway safety (in the advent of autonomous vehicles), and defense and national security (“cyber” is the 4th dimension of warfare after land, sea, and air/space). Finally, imagine the future hack and intentional mis-classification of facial recognition inferences sourced from billions of camera-enabled devices leading to false charges against innocents. Who controls the AI code, and with what objectives? If consumers, businesses and governments lose trust, the promise of the connected world will languish, and the full potential of technology to improve the lives of people across the globe will not be realized.

So, my semiconductor industry colleagues ask: “What? Are you kidding me? You are laying the future of societal progress on The Digital Planet on us?” Yes.

Semiconductors are at the heart of the digital economy. For the uninitiated, semiconductors are the “chips” that: process and store data, voice and video in mobile phones, tablets and consumer

devices; drive the network infrastructure central to the internet; power high performance computer platforms that crunch massive amounts of data in “the cloud”; provide sensor and processing capability to autonomous vehicles; and enable a wide variety of industrial, defense and aerospace applications. In 1965 Gordon Moore of Intel made the “observation” that the number of transistors in a dense integrated circuit would double approximately every two years. The industry made that a reality for over 50 years, as well as its corollary that chip performance would double every 18 months (due to more and faster transistors).

The technologists and innovators in the industry are a special breed of chemical, materials science, physics, computer science, software and electronics engineers. They operate in the world of nanometers (nm), a measure one-billionth of a meter. For calibration, a sheet of paper is about 100,000nm in thickness. A single strand of human DNA is 2.5nm in diameter. The diameter of an individual atom is in the range of .1-.5nm. The leading edge of semiconductor production in 2018 will be done at 7nm. In one leading edge semiconductor production step, a set of chemical reactions literally grow the layers of transistors one atom at a time. This type of manufacturing prowess, combined with equivalent strides in design automation and chip design, results in staggering capability. Nvidia’s latest graphics processor (GV 100 Volta) has a mind-boggling 21 billion transistors on the chip. The semiconductor community has arguably delivered innovation and solved challenges on a scale unmatched by any other industry.

With this track record of innovation and solving tough problems, why is there not a chip-based solution to the security necessary to engender Digital Trust? Good question.

The industry has been working on the challenge. Among the innovation in this domain are: encryption standards, methods and authorization protocols (e.g.; AES, RSA, ECC, “hardware root of trust”); a range of innovative biometric solutions; an Underwriter’s Lab Cybersecurity Assurance Program; the ability to prevent hackers from gaining access to embedded software code; and the creation of OpenFOG, an industry consortium to guide standards for secure, reliable networks between the cloud and intelligent endpoint devices. Arm, the microprocessor architecture company, has published a “Security Manifesto” as a call to action for the industry.

Yet despite all of this, as recently as January 2018 we have seen the revelations of Meltdown and Spectre, the high-profile chip-level hardware bugs that allow attackers to access information from the memory of other programs. These defects were featured by the press most prominently with Intel processor designs, but also appear to impact AMD and Arm-based designs.

A full solution to digital trust and security must be an end-to-end solution, integrating all aspects of the digital value chain. This includes software, internet solutions, networking and communications, and hardware platforms across the spectrum from the smallest IoT device to the largest supercomputer. Service providers across this value chain and end users themselves (corporate, government and individual) share responsibility. The semiconductor industry might argue that it is only a “necessary but not sufficient” part of the solution. Perhaps. But this would not be acting in its vested self-interest. Semiconductor industry revenue in 2017 topped \$412 billion, with compelling growth in its sights driven by killer applications and disruptive technologies such

as artificial intelligence, IoT, virtual reality, autonomous/connected cars, big data, cryptocurrency and blockchain, among others. And these markets are largely incremental to the substantial scale of existing segments. The rate of industry growth will be a function of delivering TRUST. Governments should provide funding to accelerate innovation and legislate appropriate standards. But Digital Trust is primarily an industry responsibility.

Here is the challenge and opportunity for the semiconductor industry:

- **Solve On-Chip Security**—make chips hack-proof, but able to receive “Trusted Source” updates
- Embed security into the **chip design and manufacturing processes**, including IP and software
- Use a **standards-based and platforms approach** to enable rapid innovation
- Ensure **global supply chain integrity** from fab to assembly-and-test to system house to customer
- **“QA the process”**— provide customers assurances that chips are secure
- **Be the proof point**—apply solutions in the semiconductor industry first

Digital Trust, the central ingredient to advancing societal good in the digital economy, is at the nexus of societal progress and the rate of adoption of technology innovation. Delivering digital trust is in the vested self-interest of the semiconductor industry. Technology companies have a unique responsibility to society and the opportunity to make it happen. If the semiconductor industry can achieve 50 years of Moore’s Law. and design and manufacture at the atomic level, surely it is up to the challenge! Which company or industry organization will lead and deliver?

Terry Daly is Senior Fellow at The Council on Emerging Market Enterprises, The Fletcher School of Law & Diplomacy. He retired after 33 years in the technology industry as senior vice president with GLOBALFOUNDRIES, a Silicon Valley-based semiconductor company. He holds a bachelors in engineering degree from the United States Military Academy at West Point and a masters in international relations degree from The Fletcher School, Tufts University in Boston.



BACK TO THE FUTURE: THE KREMLIN'S VISION OF THE RUSSIAN INFORMATION SOCIETY

by Ari Axelrod

For several generations of Soviet citizens this device (see right) would be instantly recognizable. The early pre-WWII models came only in black and were of round shape, colloquially called "tarelka" (dinner plate). Later models introduced in the '60's and '70's looked more like a wooden box, perhaps 12"x6"x4" in size, and came mostly in brown and white. Most of them had one control button, but top-of-the line models—many families would be proud to own one—had two. To a foreign visitor, these boxes looked like portable radio sets. But they were not wireless radios. They were "reproducers," loudspeakers fed by a wire and capable of playing only one channel, so called Program One, a carefully curated stream of government-approved news, propaganda, soccer commentary, and classical music. Once a week—on Sundays—it would feature a humor talk show, lampooning thoroughly noncontroversial subjects such as alcoholic husbands, petty marketplace thieves, and—of course—Western Imperialists.

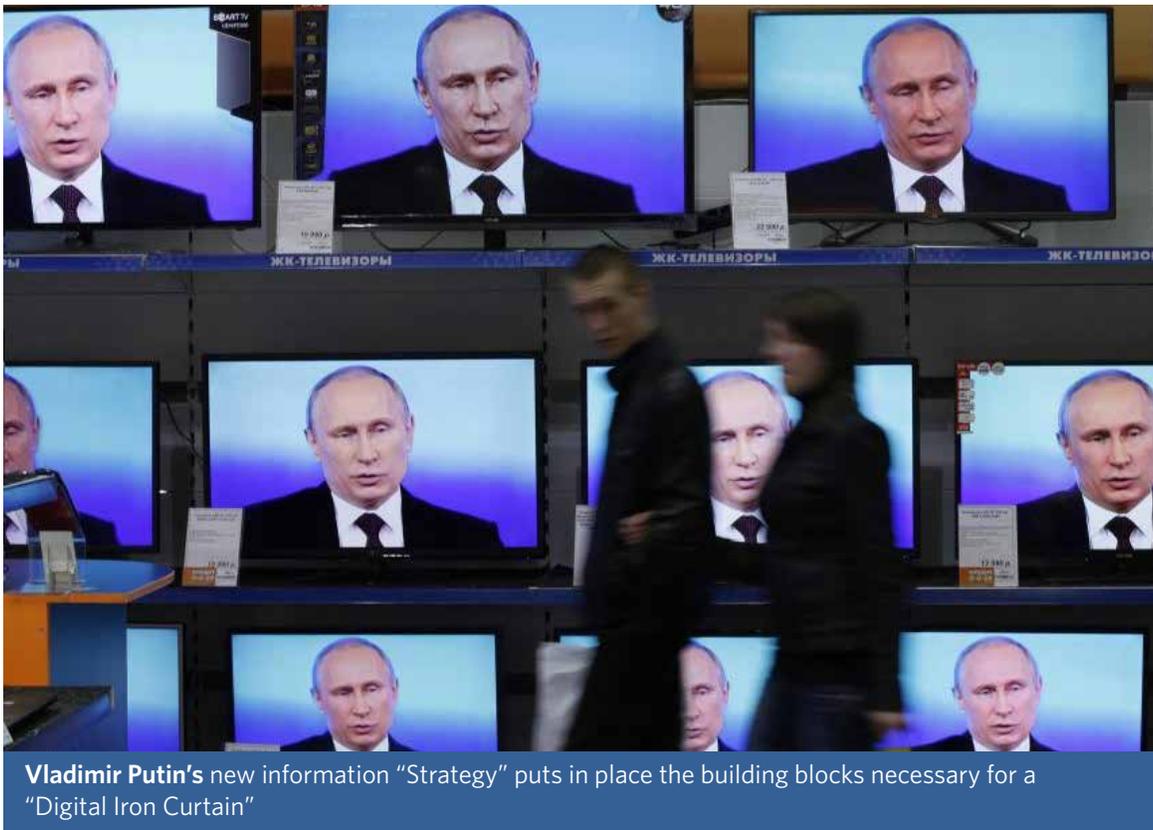


Reproducers gave the user full control. To begin with, you could use the button to control volume. And, if you were lucky enough to own a deluxe two-button box, you could also use the second button to select between Program One and two additional channels: "Mayak" and Educational. "Mayak" (Lighthouse) played news for 5-7 minutes on the top and bottom of every hour, the rest of time filled with Russian folk and light music; while Educational channel offered helpful courses in history, calculus, and, occasionally, advice on cooking or home gardening. In other words, everything a good citizen might need or want.

Reproducers were ubiquitous. They were mandatory in every city apartment, in every hut in the countryside, in every workplace—and they were almost always on. They were simply a part of life, always there, even if not always paid a lot of attention to. And while reproducers were deservedly associated by many with the dishonesty and deceit of the ruling Communist Party, they were also inseparably linked to announcements of major victories of the nation: Sputnik, Gagarin's flight, and—the most revered of all—the announcement of victory in WWII, May 9th 1945. There is little doubt that young Vladimir Putin growing up in Leningrad in the '60's and '70's has a memory of a reproducer firmly etched in his conscious and subconscious memory. And things that are associated with our youth often have special meanings...

Fast forward about half a century.

On May 9, 2017, on the 62nd anniversary of the Victory Day, President Vladimir Putin, serving his third term in office, signed an Executive Order on a document entitled: “2017-2030 Strategy for the Development of an Informational Society in the Russian Federation.” The choice of the date is hardly a coincidence. In Russia, this day is traditionally associated with demonstration of strength, with the resolve to win, with the willingness to sacrifice for Motherland. And the “Strategy” doesn’t disappoint—rather than a technological or economic blueprint, it reads more like a political manifesto or a military doctrine, intended to “defend, “protect,” and “advance” what it defines as Russian digital sovereignty.



There are, essentially, three key themes in the 29-page document:

- The Russian informational society of the future should assure citizen’s universal access to information as they need for their intellectual development, cultural advancement, and economic activity
- But the right of access is not absolute. Citizens should receive only “objective, reliable, and safe information,” which would prioritize traditional Russian moral values and promote development of the Russian state and Russian cultural identity
- It is regrettable, but the global Internet, as it exists now, does not meet the above requirements. Therefore, one of the most important tasks, particularly in the near-term, is to create a “system that would support reliable, safe, and independent Russian segment of the Internet”

The "Strategy" puts in place 19 critical initiatives, among them "further development of the tools to limit access to information that is contrary to Russian laws," "replacement of imported hardware and software by Russian-developed components," "exclusive use of only Russian-sourced State-controlled means of cybersecurity," and "making sure that all data reside on Russian servers, physically located on the territory of Russian Federation." In other words, the "Strategy" sets up all necessary building blocks for a future digital Iron Curtain.

It is remarkable how well a reproducer could serve the Russian Informational Society as it is envisioned by this "Strategy" Reproducers are cheap and universally available. The listeners have a choice of sources (of course, to the extent that they all promote "objective, reliable, and safe information," just as Channel One, Mayak, and Educational Channel did). They are entirely Russian-made and virtually un-hackable. So, were Putin's childhood memories of reproducer an inspiration for the "Strategy"? And are reproducers on the way to rebirth in Russia?

Perhaps. Yet any power that attempts to limit its citizens' access to free and uncensored information should keep in mind the end of the reproducers' reign. In the late '70's and '80's, another device began to appear in people's homes, first secretly and then increasingly more and more open. It was a shortwave radio, capable of receiving not only Channel One but also BBC and Voice of America. The rest of the story is history.

Ari Axelrod is Managing Director of Boston International Management Services, a consulting firm serving US-based and multinational companies in the areas of strategic planning, financial analysis and management. He is also CFO of Boston Clinical Trials, a clinical research center.



WHY LONDON'S FINTECH ECOSYSTEM IS THE LEADING INNOVATION AND VALIDATION CENTER FOR GLOBAL FINTECH

by **Arthur Sculley**

According to Goldman Sachs in 2016, FinTechs will displace \$4.7 trillion of the current \$11 trillion of global financial service revenues (about 14% of global GDP) through the disintermediation of banks, insurance companies, asset managers and brokerage companies. These giant financial firms will find it near impossible to compete with nimble FinTechs because of their multi-legacy systems, bureaucratic management structure and post 2008/9 compliance and capital requirements. FinTechs have reconfigured pathways to connect financial products to consumers. They offer a simpler, cheaper, user-friendly consumer experience on the smart phone now universally available at a fraction of the cost five years ago. Transparency and financial literacy will expose many traditional financial services as opaque and noncompetitive.

London is globally-centric and has long been recognized as the world's leading international banking center because of its concentration of international banks, regulatory environment, location and time zone. The route to innovation in Canary Wharf and its FinTech surroundings passes by the Greenwich Museum, poignant symbol of its historic trade routes. London jumped ahead of other FinTech centers such as New York, greater San Francisco, Singapore, Hong Kong and Beijing by leveraging off this foundation.

Although New York is also noted for its innovation in capital markets, the domestic market drives its priorities. Furthermore, US FinTech regulations are hampered by its complex system of federal and state financial regulators. San Francisco is well advanced in technology, social media and technology capital but lacks the financial sophistication of London and New York and has the same US regulatory issues as New York. Hong Kong and Singapore have successfully modeled themselves on London in order to facilitate the growth of FinTech. However, Hong Kong is China-centric and Singapore is regionally-centric. China itself is the exception because of its size, government central control, closed internet and unique domestic innovation. Beijing along with Shenzhen and Shanghai are capitalizing on the extraordinary success of Tencent's WeChat and Alibaba's Ant Financial which converted their messaging apps into mini financial operating systems and by-passing traditional banking and credit card services. So far China has not been able to leverage its advantages internationally both for regulatory and China-centric reasons.

In August, 2014 the UK Chancellor of the Exchequer announced the UK's ambition to be the "the global capital of FinTech" and the UK Government adjusted its policies to focus on (1) talent, (2) capital, (3) regulatory and tax policy and (4) demand:

Talent. Today, despite Brexit, the UK has a broad base of technology, financial and entrepreneurial talent with an estimated 30% of FinTech founders in the UK coming from overseas. In addition, academia, traditional financial institutions and technology companies help to expand this domain experience through government and industry-backed incubators and accelerators.

Capital. Professional angel investors, venture capital, private equity, hedge funds, mergers and acquisitions and public offerings provide substantial capital for starting and scaling up FinTechs.

Policy. One of London's greatest strengths is its progressive FinTech regulatory and tax environment. The Financial Control Authority (FCA) combines all the UK's financial regulators into one department. A special group of FCA professionals has been set up to focus on advising and helping FinTechs understand existing and possible future regulations. The FCA established an innovation hub for new ideas and a "regulatory sand box" for FinTechs to try out new ideas under close supervision. New tax incentives are simple and competitive. They include relief with low capital gains tax for entrepreneurs, R & D tax credits, an enterprise investment scheme for early investors and tax relief on new equipment.

Demand. Innovative FinTech services are in high demand with UK consumers, financial institutions and corporations in the world's sixth largest economy.

The UK is adopting the Global Digital Protection Regulation in May, 2018. Data protection and cybersecurity are top priorities for all UK FinTechs in their new systems development. This is a major advantage for international expansion over US and Chinese FinTechs, which will be constrained by legacy.

Finally, although Brexit has created the uncertainty that traditional financial institutions dislike, UK FinTechs, which have become used to by-passing traditional consumer routes, are well-placed to navigate this uncertainty. London in particular has over a half century of experience in laying the ground work for today's FinTech ecosystem and centuries of cross border financial and trading experience. For the foreseeable future, London will therefore remain the innovation and validation center of choice for FinTechs with global aspirations. To duplicate the unique London ecosystem elsewhere will be a challenge.

Arthur Sculley, CEME Senior Fellow, is a former Managing Director at JP Morgan based in Hong Kong and Singapore, was later co-founder of the early FinTech IntraLinks in New York in 1996 and is now co-founder of the FinTech HyperJar in London.



Even in a post-Brexit world, London is positioned to remain the global hub for FinTech

CEME JOURNAL

THE COUNCIL ON EMERGING MARKET ENTERPRISES

ABOUT CEME

The Council on Emerging Markets (CEME) is a “think tank” comprising “doers”—experts who range from current and former senior corporate executives, leaders of institutions such as the World Bank and Transparency International, bankers, entrepreneurs, management consultants, journalists, technologists, and at least one presidential candidate—housed within The Fletcher School’s Institute for Business in the Global Context. Our CEME Senior Fellows have deep knowledge of emerging markets, lending very diverse perspectives on a complex world, where even the idea of what is an emerging market has emerged into markets that represent the most nascent, risky, and innovative intersections of business and the global context.

As part of their work, CEME Senior Fellows provide thought leadership and act as experts, project directors, and advisors for IBGC’s various research initiatives. Most importantly, they serve as an extended body of mentors to Fletcher students. Through this mentorship, CEME Senior Fellows complement our faculty to prepare the next generation of leaders that will follow in their footsteps.

CEME is chaired by Bhaskar Chakravorti, Dean of Global Business at The Fletcher School.

Learn more at sites.tufts.edu/ceme



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