The future of banking is already here. Are you prepared?

BANK 4.0 explores the radical transformation already taking place in banking, and follows it to its logical conclusion. What will banking look like in 30 years? 50 years? The world's best banks are responding to this transformation; regulators are rethinking friction, licensing and regulation; FinTech start-ups are redefining what it means to bank today. Banks are being forced to develop new capabilities, new jobs and new skills—and it's a whole new world. The future of banking is not about new value stores, payment and credit utility—it's embedded in voice-based smart assistants like Alexa and Siri, available 24/7 to pay, book, transact or enquire. **BANK 4.0** means that either your bank is embedded in your world, or it isn't.

The final volume in the **BANK** series, this book explores the future of banks amidst the evolution of technology and highlights the beginnings of this revolution already at work.

www.bank4dot0.com

"Brett's best yet! While one may not agree with all his assertions, the fundamental insights—that banking needs to be reimagined from first principles, that it must be embedded into daily lives, that data, AI and voice are game changers in this regard—cannot be argued against. **Bank 4.0** *is a tour de force that opens your eyes to what already exists, and your mind to the imminent possibilities. A must read."*

— Piyush Gupta, Group Chief Executive Officer, DBS Bank

visit our website at:
www.marshallcavendish.com/genref

Marshall Cavendish Business

£19.99 IN UK ONLY
BUSINESS/BANKING
ISBN 978-981-4771-76-4
9 789814 771764

BRETT KING

BANK 4.0

Marshall Cavendish Business

From the bestselling author of Augmented and Bank 3.0

BANK 4.0

Banking Everywhere, Never at a Bank

BRETT KING

www.brettking.com

Praise for Bank 4.0

"From Bank 2.0 to 4.0, Brett has not only been tremendously accurate in predicting where the ball is going in the future of money, but, more importantly, he's been actively shaping how it will get there. Here's a tip: don't bet against him."

— Alex Sion
Co-founder of Moven and
General Manager, Mobile Channel, JPMorgan Chase

"Brett King has done it again with his latest volume. *Bank 4.0* pushes us to deconstruct the mouse trap we call a bank, wipe the digital slate clean, and re-imagine banking for the year 2050 by focusing on first principles and customer needs. Drawing on examples from the developing world, King paints a compelling vision for how digitally-native banking can be a winning strategy—and an inclusive one."

— Jennifer Tescher
President & CEO, the Center for Financial Services Innovation

"In *Bank 4.0*, Brett does it again and moves our thinking along in financial services from rethinking the bank model as discussed in his previous books to pointing to how to build the new model using first principles thinking. It's another ground-breaking book and brings together not only his own thoughts, but the thinking of many of us who are trying to create the next generation of finance using technology, or FinTech if you prefer. Anyone involved in finance, technology, money and banking who doesn't pick up this book is missing the key to their future and, as a result, might not have one."

— Chris Skinner
Bestselling Author of *Digital Human* and
Chairman of the Financial Services Club

"Brett's best yet! While one may not agree with all his assertions, the fundamental insights—that banking needs to be reimagined from first principles, that it must be embedded into daily lives, that data, AI and voice are game changers in this regard—cannot be argued against. *Bank 4.0* is a tour de force that opens your eyes to what already exists, and your mind to the imminent possibilities. A must read."

— Piyush Gupta
Group Chief Executive Officer, DBS Bank

"As the banking industry continues to disrupt at an ever-accelerating pace, this unputdownable book paints a future that is both exciting and inspiring. This is Brett, the King of futurism, at his compelling best! Speaking as a banker, you must read Bank 4.0."

— Suvo Sakar
Senior EVP and Group Head of Retail Banking
and Wealth Management, Emirates NBD

"Banking is being disrupted on a global basis and Brett's book helps to navigate through these rapid transformations. A must read in the new era of banking."

— Valentin Stalf
CEO and co-founder of N26

"Yet again, Brett King brings together some of the most knowledgeable and experienced figures in global FinTech for this authoritative guide to the very latest mega trends."

— Anne Boden
CEO and founder, Starling Bank

"'I don't think anyone else on the planet has Brett's ability to piece together what is happening around the globe and forecast the future of banking. A thoroughly researched, data-driven analysis from someone who has 'walked the walk'."

— Anthony Thompson
Founder & former chairman Atom Bank and Metro Bank,
co-author of *No Small Change*

"Two years ago on stage in Beirut, I called Brett King 'the King of Ban-King' and I stand by every word. This book continues his canon on the subject of where banking is going next. Everybody in a FinTech company should read it, everybody in traditional banking HAS to read it or they will be without a business in five years."

— Monty Mumford
Founder of Mob76, SXSW emcee and public speaker,
writing for *The Economist*, BBC, *Forbes* and *Fast Company*

"The organizations we develop partnerships with know that our customers are in the driver's seat. We're innovating for them and that's non-negotiable. Brett King and Moven understood that from day one, and *Bank 4.0* is his manifesto."

— Rizwan Khalfan
EVP, Chief Digital and Payments Officer, TD Bank Group

BANK 4.0

BANK 4.0

Banking Everywhere, Never at a Bank

BRETT KING

Marshall Cavendish Business

Reprinted 2018, 2020

Published by Marshall Cavendish Business
An imprint of Marshall Cavendish International

Other Marshall Cavendish Offices
Marshall Cavendish Corporation, 99 White Plains Road, Tarrytown NY 10591-9001, USA • Marshall Cavendish International (Thailand) Co Ltd, 253 Asoke, 12th Flr, Sukhumvit 21 Road, Klongtoey Nua, Wattana, Bangkok 10110, Thailand • Marshall Cavendish (Malaysia) Sdn Bhd, Times Subang, Lot 46, Subang Hi-Tech Industrial Park, Batu Tiga, 40000 Shah Alam, Selangor Darul Ehsan, Malaysia

Marshall Cavendish is a registered trademark of Times Publishing Limited

National Library Board, Singapore Cataloguing-in-Publication Data

Names: King, Brett, 1968-
Title: Bank 4.0 : banking everywhere, never at a bank / Brett King.
Description: Singapore : Marshall Cavendish Business, [2018]
Identifiers: OCN 1042194265 | 978-981-4771-76-4 (hardcover)
Subjects: LCSH: Banks and banking—Customer services. | Financial services industry—Technological innovations.
Classification: DDC 332.17—dc23

Cover art by Kylie Eva Maxwell

Printed in Singapore

To Katie, with whom I am quantum entangled,
and my Dad, a role model, and whose energy allowed me
the freedom to go well beyond my limitations.

Contents

PART TWO: Banking re-imagined for a real-time world

PART THREE: Why FinTech companies are proving banks aren't necessary

PART FOUR: Which banks survive, which don't

Preface

Bank 2.0 was written in 2009 when mobile had just started to become a significant part of retail banking, and just after the internet had surpassed all other banking channels for day-to-day access. Bitcoin had just launched. Betterment, Simple and Moven were yet to be announced, in fact, FinTech overall was not yet even a term for most of us. *Bank 2.0* was a simple exploration of the fact that customer behaviour was rapidly evolving as a result of technology, and this was creating an imperative for change within banking which was undeniable.

By 2012 mobile was the next big thing. It was on track to surpass internet, and there was no longer an argument about whether or not banks should have a mobile application. The importance of day-to-day use of technology to access banking was clear, but most banks were still in the evolutionary mode, where mobile was considered simply a subset of internet banking and the technology team were still begging the executive floor for adequate funding. That was by no means an easy battle. *Bank 3.0* was the further realisation that you could be a bank based exclusively on emerging technology. As I wrote in *Bank 3.0*: "Banking is no longer somewhere you go, but something you do." Banking was moving out of the physical realm into the digital.

That was more than six years ago. That's a long time between drinks, as we say in Australia. The reason for the delay in me writing a *Bank 4.0* vision was simple—the future of where banking would go after the whole multi-channel realisation wasn't yet clear. It took some incredible changes in financial inclusion and technology adoption via unconventional, non-bank players for me to realise that there was a systemic shift in financial

access that would undermine traditional bank models over the coming decade or two. The unexpected element of this was that the future of banking was, in fact, emerging out of developing economies, and not the established incumbent banking sphere.

Over the last 40 years we have moved from the branch as the only channel available for access to banking services, to multi-channel capability and then omni-channel, and finally to digital omni-channel for customers exclusively accessing banking via digital. The problem for most banks was that we were simply adding technology on top of the old, traditional banking model. We can tell this primarily because the products and processes were essentially identical, just retrofitted for digital. The application forms had just changed from the paper forms in the branch to electronic application forms online. We still shipped plastic cards, we still sent paper to customers in the mail, we still used signatures, we still maintained you needed a human for complex banking problems.

In markets like China, India, Kenya and elsewhere, however, non-conventional players were attacking payments, basic savings, micro-lending and other capabilities in ways that were nothing like how we banked through the branch traditionally. By building up new customer scenarios on mobile without an existing bank product as a reference point, we started to see new types of banking experiences that were influenced more by technology and behaviour than the processes or policies born from branch distribution. This evolution was led by technology players like m-Pesa, Ant Financial's AliPay, Tencent's WeChat, Paytm and many more. This combined with new FinTech operators in the established economies like Acorns, Digit, Robinhood and others who were creating behavioural models for savings and investing. There was a realisation that if you took the core utility and purpose of financial services, but optimised the design of that for the mobile world, then you'd get solutions that would scale better than retrofitting branch banking, and that would integrate into customer's lives more naturally.

If we observe the trend over the last 25-plus years since the commercial internet arrived, we can see that there's an overwhelming drift towards low-friction, low-latency engagement. Like every other service platform

today, banking is being placed into a world that expects real-time, instant gratification. Banking, however, is not easily retrofitted into a real-time world if you're used to static processes that are based on a paper application form and hardwired compliance processes. Compared with many other industries, banking has been slower to adapt when it comes to the revenue aspects of e-commerce.

When technology-first players emerged in markets where there were large unbanked populations that had never visited a bank branch, there was no need to replicate branch-based thinking, there was just the need to facilitate access to the core utility of the bank. This, combined with the design possibilities afforded by technologies like mobile, allowed for some spectacular rethinking of how banking could be better embedded in our world. It turned out that these new approaches offered much better margin, better customer satisfaction, engendered trust that was just as good as the old-world incumbents, and businesses that held far more dynamic scaling potential.

This was when it became clear to me that the trajectory was shifting and that we were seeing an emerging template for the future of banking, one that wouldn't include most of the banks we know today. Why? Because if you're retrofitting the branch and human on to digital, you're going to miss the boat. Banking is being redesigned to fit in a world where technology is pervasive and ubiquitous; the only way you stay relevant in this world is by creating experiences purpose-built for that world. Iterating on the branch isn't going to be enough.

I hope you enjoy *Bank 4.0*.

Brett King
Founder of Moven
Host of Breaking Banks Radio

Acknowledgements

As with any book like this, it takes a tribe. This time around was much tougher to get the book done because Moven has been growing significantly and it required more focus. So the first people I'd like to thank are the team at Moven—specifically my executive team, including our new CEO Marek Forsyiak, Richard Radice, Kumar Ampani, Andrew Clark, Denny Brandt, Ryan Walter, and our teams dotted around the world in New York, Philly, Tokyo and Sydney. We work hard, but we have a mission we share and we have plenty of laughs along the way.

Secondly, the team at Marshall Cavendish, who remained extremely patient as I rolled past each consecutive deadline with constant apologies for the delays, including Melvin, Janine, Norjan, Mei and Mike and our partners for translation in markets like China, especially Daisy.

Thirdly, the team at Breaking Banks and Provoke Media that kept the pressure off by helping me get the radio show out each week, including JP Nicols, Jason Henrichs, Simon Spencer, Liesbeth Severiens and Rachel Morrissey.

The contributors for this book were also phenomenal. Anytime I get to collaborate with my FinTech Mafia pals Chris Skinner, Dave Birch, Jim Marous, Duena Blomstrom and others, you know it's going to be something special for readers. To the team at Ripple, Jo Ann Barefoot, Suvo at Emirates NBD, Brian Roemmele, Michael Jordan, Spiros Margaris, and John Chaplin—thank you.

I would be remiss not to thank the coffee shops that once again contributed to this tome.

Lastly, I couldn't have done this without the constant support of a small team who keep me sane daily. Jay Kemp and Tanja Markovic at

Provoke Management speaker bureau, and my social media team. To my dad, who despite daily challenges with his health remains my greatest fan, and my greatest mentor.

Most of all, my partner in life, Katie Schultz, who inspires me, drives me to new heights and puts up with my crazy schedule and global travels. Her, Charli, Matt, Hannah and Mr. T are a constant delight and make me one very happy author.

Part 01
Bank 2050

1 Getting Back to First Principles

Everybody has a plan until they get punched in the mouth.
—Mike Tyson

Banking isn't rocket science, but as it turns out, rocket science is a great analogy for the future state of banking. Putting men on the moon is, to date, perhaps the greatest endeavour mankind has committed to. It inspired generations and, until we successfully put boots on the surface of Mars, will likely remain the single most significant technological and scientific achievement of the last 100 years. Getting men to the moon required massive expenditure, incredible advances in engineering, a fair bit of good old fashion luck and the "right stuff".

Before the US could get Neil Armstrong all the way up to the moon, they needed the right stuff in a different area—in figuring out the science.

At the end of World War II there was a very serious plan that would set the foundation for the entire Space Race and Cold War. It was the race for the best German scientists, engineers and technicians of the disintegrating Nazi regime. The predecessor to the CIA, the United States' OSS (Office of Strategic Services), were instrumental in bringing more than 1,500 German scientists and engineers back to America at the conclusion of World War II. The highly secretive operation responsible for this mass defection was codenamed "Overcast" (later to be renamed Operation "Paperclip"). The primary purpose of this operation was denying access to the best and brightest Nazi scientists to both the Russians and the British, who were both allies of the US at this time. "Paperclip" was based on a highly secretive

document known within OSS circles as "The Black List", and there was one single name that was right at the top of that list: Wernher von Braun.

In the final stages of World War II, von Braun could see that the Germans were ultimately going to lose the war, and so in 1945 he assembled his key staff and asked them the question: who should they surrender to? The Russians, well known for their cruelty to German prisoners of war, were too much of a risk—they could just as easily kill von Braun's team as utilize them. Safely surrendering to the US became the focus for von Braun's own covert planning in the closing days of World War II. The question he faced was how to surrender without the remnants of the Nazi regime getting tipped off and putting an end to his scheme.

For this von Braun had to, twice, manipulate his superiors, forge paperwork, travel incognito and disguise himself as an SS officer to create a very small window of opportunity for surrender. Convincing his superior that he and his team needed to divert from Berlin to Austria, so that the V-2 rocket team was not at risk by invading Soviet forces, von Braun engineered an opportunity to surrender himself and his brother to the Americans. In the end, Magnus von Braun just walked up to an American private from the 44th Infantry Division on the streets of Austria and presented himself as the brother of the head of Germany's most elite secret weapons program[1].

> Suddenly a young German came to members of Anti-Tank Company, 324th Infantry and announced that the inventor of the deadly V-2 rocket bomb was a few hundred yards away—and wanted to come through the lines and surrender. The young German's name was Magnus von Braun, and he claimed that his brother Wernher was the inventor of the V-2 bomb. Pfc Fred Schneikert, Sheboygan, Wis., an interpreter, listened to the tale and said just what the rest of the infantrymen were thinking: "I think you're nuts," he told von Braun, "but we'll investigate."
>
> —The Battle History of the 44th Infantry Division: "Mission Accomplished"

Private First Class Fred Schneikert likely presided over the single greatest intelligence coup of World War II, save maybe for the capture of U-570 and its Enigma cipher machine.

To understand von Braun and his willingness to work on a WWII weapon of mass destruction like the V-2 rocket (which is estimated to have killed 2,754 civilians in London, with another 6,523 injured[2]), it needs to be understood that he simply saw the Nazi ballistic missile program as a means to an end. In von Braun's mind, the V2 was simply a prototype of rockets that would one day carry men into space—that was his end game.

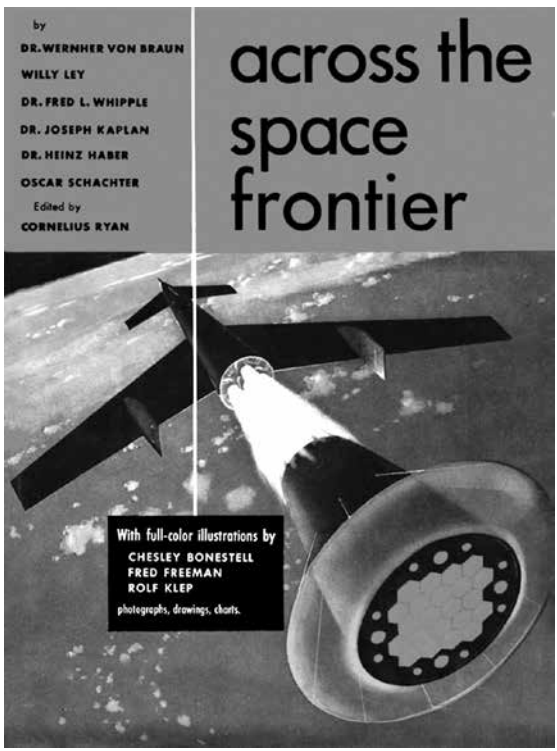

Figure 1: Von Braun's vision for manned space travel (Credit: NASA).

The images and engineering principles of spacecraft we have from the 1950s we owe largely to von Braun's designs. The three-stage design of modern rockets, the chosen propellants and fuel, the recovery ship system for returning capsules, the initial NASA designs for space stations and

Mars programs, all came from von Braun's early musings and engineering drawings. Sixteen years after von Braun's surrender to Allied forces, President John F. Kennedy Jr announced that by the end of the decade the US would put a man on the moon. It would be in a rocket built by Wernher von Braun.

The Saturn V was an astounding piece of engineering. Today, it remains the largest and most complex vehicle ever built. A total of 13 Saturn Vs were launched between 1967 and 1973 carrying the Apollo and Skylab missions. The Saturn V first stage carried 203,400 gallons (770,000 litres) of kerosene fuel and 318,000 gallons (1.2 million litres) of liquid oxygen needed for combustion. At lift-off, the stage's five F-1 rocket engines produced an incredible 7.5 million pounds of thrust, or about 25 times that of an Airbus A380's four engines at take-off. In today's money, each Apollo launch and flight cost around $1.2 billion dollars.

However, despite the incredible advances of von Braun's program in the 1950s and 1960s, manned spaceflight hasn't progressed significantly since. In fact, one could argue that the US' capabilities in this area have been declining ever since Apollo. On 20th July 1969, the Americans landed Neil Armstrong and Buzz Aldrin on the lunar surface, but after December 1972 no further manned missions were launched. In the 1980s the US had the space shuttle and could get to low-earth orbit, but today they are renting seats on Russian Soyuz vehicles to get NASA astronauts to the International Space Station.

First principles design thinking

While the cost of launching commercial payloads into space has decreased by some 50–60 percent since the Apollo days, the core technology behind the space industry has simply gone through multiple derivative iterations of von Braun's initial V-2 work. The rocket design, production process, and mechanics all are essentially based on the work of NASA in the Apollo era, which itself was based on the V-2 design. This process of iterative design, or engineering, is known to engineers as "design by analogy"[3].

Design by analogy works on the philosophy that as engineering capabilities and knowledge improve, engineers find better ways to iterate on

a base design, perhaps finding technical solutions to previous limitations. But design by analogy creates limitations in engineering thinking, because you're starting with a template—the work is derivative. To create something truly revolutionary you have to be prepared to start from scratch.

Enter Elon Musk. Like von Braun, Musk has an unyielding vision for space travel. Musk isn't interested in just returning to the Moon though, he has his sights set on Mars. For Musk, this is about nothing short of the survival of humanity. In discussing his obsession with Mars, Musk refers to the fact that on at least five occasions the Earth has faced an extinction level event, and that we're due for another one at any moment. We've had dinosaur-killer scale asteroids sail past Earth on near collision courses on multiple occasions in recent years, too. Thus, Musk argues, we must build the "insurance policy" of off-world colonies.

After his successful exit from PayPal, Musk created three major new businesses: Tesla, SpaceX and Solar City[4]. Instrumental in Musk's approach to each of these businesses was his belief in the engineering and design concept called *first principles*. Unlike design-by-analogy or derivative design, first principles take problems back to the constitutent components, right back to the physics of the design—what the design was intended to do. A great example of first principles design is the motor vehicle. At the time that Carl Benz invented the first two-seater lightweight gasoline car in 1885, everyone else was trying to optimize carriage design for use with horses. Benz took the fundamentals of transport and applied the capabilities of the combustion engine to create something new.

> I think it's important to reason from first principles rather than by analogy. The normal way we conduct our lives is we reason by analogy. [With analogy] we are doing this because it's like something else that was done, or it is like what other people are doing. [With first principles] you boil things down to the most fundamental truths…and then reason up from there.
>
> —Elon Musk, YouTube video, First Principles[5]

To get to Mars, Musk has reckoned that we need to reduce the cost to orbit by a factor of 10. A tall order for NASA, a seemingly impossible task for a software engineer who had never built a rocket before. As noted in Musk's recent biography (Vance, 2015), Musk has the unique ability to learn new skills to an extremely high level of proficiency in very short time frames. Thus, when it came to rocket design, he simply taught himself—not just the engineering of pressure vessels, rocket engine chambers and avionics, but the physics behind every aspect of rocketry—and even the chemistry involved. Musk reasoned, if he was to start from scratch based upon the computing capability, engineering techniques, materials sciences and improved physics understanding we have today, would we build rockets the same way we had for the last 50 years? The answer was clearly no.

In 2010 NASA was paying roughly $380 million per launch. SpaceX currently advertises a $65 million launch cost for the Falcon 9, and $90 million for the Falcon Heavy. SpaceX's current cost per kilogram of cargo to low-earth orbit of $1,100 is well below the $14,000–39,000 per kilogram launch cost of United Launch Alliance, the lowest priced direct competitor for SpaceX in the United States.

The last major manned space program of the US, the space shuttle program, averaged a cost-per-kilo to orbit of $18,000. Now that SpaceX has figured out how to land their first stage vehicles back on land and on their oceangoing drones[6], such as JUST READ THE INSTRUCTIONS and VANDENBERG OF COURSE I STILL LOVE YOU[7], the reusability factor will reduce their cost per kilo to orbit of their Falcon Heavy launch vehicle down to around $400 over the next few years. This means that SpaceX will have reduced the cost to orbit by more than 90 percent in the 14 short years of their commercial operations. NASA's nearest competitor to the Falcon Heavy will be the Space Launch System, with a payload capacity of 70 metric tons, and an expected launch cost of $1 billion per launch. The Falcon Heavy at 64 metric tons and $90 million per launch represents one-tenth of the cost, before reusability.

Figure 2: Part of the secret to lower cost is advancements SpaceX has made in integrated manufacturing.

A greater than 90 percent cost to orbit reduction, reusability with rockets that land themselves, and a fuel source that is easily manufactured and stored on Mars.

Welcome to the revolutionary benefits of first principles design thinking.

The first principles iPhone

Musk isn't the only one to believe in the philosophy of first principles design. Steve Jobs was a believer in getting back to basics for redesigning well-worn concepts. Instead of iterating on the famous Motorola flip phone, the Blackberry, or the Nokia "Banana" phone, Jobs started from scratch in reimagining a phone, browser and iPod combined into a personal "smart" device.

> There's the great story about how Steve carried a block of wood around the office while the team was creating the iPhone. He wanted to remind everyone around him that things should be simple. Jobs understood that technology is only as powerful as the ability for real people to use it. And it's simple, usable functionality—not ridiculous over engineering—that makes for technological power.
>
> —Bill Wise, MediaBank, quoted in *Business Insider*, 12th October 2011

Now in fairness, Jobs may have got the "block of wood" prototyping idea from Jeff Hawkins, the lead inventor of the PalmPilot. The story goes that when he first imagined the PalmPilot, he carried blocks of wood the approximate size of the device he would later build around with him everyday. Whenever Hawkins saw a need for the device in his daily routine, he would tap on it, scribbling on the block of wood, or in his notebook, simulating or prototyping how the device might be used to solve that problem, whether it was a calendar entry, jotting down some notes or swapping contact details with a colleague.

Figure 3: The iPhone is a great example of first principles product design.

Jobs and Jony Ive, Apple's chief design officer, didn't try to iterate on an existing device design and improve on it; they started from scratch. It's why the iPhone ended up with a revolutionary touch screen design, aluminium housing, no keyboard and an app ecosystem. Do you remember the debate when the iPhone launched over the value of the Blackberry RIM keyboard versus Apple's lower accuracy touch screen keyboard? Many commentators were sure the Blackberry keyboard would win out. But it didn't.

Why am I focusing on this? Ask yourself a couple of simple questions. If you were starting from scratch today, building a banking, monetary and financial system for the world, a banking system for a single country or geography or just designing a bank account from scratch, would you build it the same way it has evolved today? Would you start with physical bank branches, insist on physical currency on paper or polymers, "wet" signatures on application forms, passbooks, plastic cards, cheque books, and the need to rock up with 17 different pieces of paper and three forms of ID for a mortgage application?

No, I'm sorry—that's just plain crazy talk. If you were starting from scratch with all the technologies and capabilities we have today, you would design something very, very different in respect to how banking would fit into people's lives. Let us then apply first principles to banking and see if there are any examples of this type of thinking emerging today. Are we seeing systems emerge that are fundamentally different?

Applying first principles to banking

The banking system we have today is a direct descendent of the banking from the Middle Ages. The Medici family in Florence, Italy, arguably created the formal structure of the bank that we still retain today, after many developments. The paper currency we have today is an iteration on coins used before the first century. Today's payments networks are iterations on the 12th century European network of the Knights Templar, who used to securely move money around for banks, royalty and wealthy aristocrats of the period. The debit cards we have today are iterations on the bank passbook that you might have owned if you had had a bank account in the year 1850. Apple Pay is itself an iteration on the debit card—effectively a tokenized version of the plastic artifact reproduced inside an iPhone. And bank branches? Well, they haven't materially changed since the oldest bank in the world, Monte Dei Paschi de Sienna, opened their doors to the public 750 years ago.

When web and mobile came along, we simply took products and concepts from the branch-based system of distribution and iterated them to fit on to those new channels. Instead of asking the question whether

we need an application form in the online process at all, we just built web pages to duplicate the process we had in the branch[8]. For many banks and regulators today, they are still so married to this process of a signature on a piece of paper and of mitigating risk to the bank through a legal physical paper record, that in many parts of the world you still can't open a bank account online or on your phone—and that's a quarter of a century after the commercial internet was launched.

Think about the absurdity of that situation for a moment. We're tied to using a first century artifact, namely a "wet signature" to uniquely and securely identify an individual for the purpose of opening a bank account. But signatures aren't secure, they aren't regularly verified, they aren't really unique, they are easily compromised, easily copied, and in the case of an identity thief using stolen or fabricated identity documents, a signature provided might not bear any resemblance to the authentic account owner's actual signature—as long as it is the first signature that particular bank gets, then they have to presume the signature matches the owner of the account.

Don't even get me started on branches[9].

Hence the big question. If you started from scratch today, designing a new banking system, would any of the structures we are used to seeing survive? If not, like Elon Musk's approach to SpaceX rockets or Steve Jobs' approach to smartphones, the only way we're going to get exponential progress and real efficiencies is through a first principles rethink of the banking system.

So, what would a "first principles" bank or bank account look like today?

In first principles, utility is king

Let's strip it down to the constitute physics, as Musk suggested. What does a bank do that no other organisation can do, or at least do consistently well? Or what do we rely on banks to provide that would remain in a re-imagined, first principles version of banking?

I would suggest banks have traditionally provided three core key pieces of utility:

1. **A value store**—The ability to store money safely (investments fall into this category)
2. **Money movement**—The ability to move your money safely
3. **Access to credit**—The ability to loan money when you need it

If you describe the essence of what you want from your bank as a customer (and it doesn't matter whether that is as a retail consumer or as a business owner), ultimately you don't start off with saying I need "product A" or "product B". Ultimately, you come up with stuff like:

- "I need to keep my money safe."
- "I need to send money fast."
- "I need to save money for [insert need/dream/wish here]."
- "I need my employer to be able to pay me."
- "I can't afford to buy this thing and I need some short-term credit."
- "I need to be able to pay my staff."
- "I want to buy a home."
- "I need to pay this bill."
- "How am I going to pay when I'm in another country?"
- "How do I make more money to pay my bills?"

Whenever we talk about what a bank does for us, or what we need from our bank, we generally don't describe channels, bank departments or products—we describe utility and functionality. Banks have tried very, very hard to train us to think in terms of products, and to some extent they have been successful.

Since the emergence of banking during the 14th century, as banks we've taken that core utility and we've added structure. Initially this structure was about network—*where* you could bank. Banks then added structure around the business of banking, trust and identity—*who* could bank, what was a bank and how you had to bank. Today you could argue that these structures have been reducing risk to both banks and consumers, rather than reducing risk or complexity around utility. Today, as users of banking, we must fight through more friction than ever before just to get to that underlying utility.

Technology now affords us the ability to radically eliminate that friction and create banking *embedded* in the world around us, delivering banking when and where we need it the most. My good friend Chris Skinner calls this "Semantic Banking".

> The semantic web today is all around us. It is immersive, ubiquitous, informed and contextual. The semantic bank will have these features, too. It will prompt us with the things we need, and warn us against doing things that will damage our financial health. It will be personalized, proactive, predictive, cognitive and contextual. We will never need to call the bank, as the semantic bank is always with us, non-stop and in real-time. As a result, nearly every bank function we think about today—paying, checking, reconciling, searching—go away as the semantic bank and web do all of this for us. We just live our lives, with our embedded financial advisor and the core utility of banking as an extension to our digital lives.
>
> —Chris Skinner, author of *ValueWeb*

In a world where banking can be delivered in real time, based on predictive algorithms and surfaced using voice-user interfaces like Alexa and Siri, in a mixed-reality head-up-display like Magic Leap or HoloLens, in an autonomous car or home, or just in increasingly smarter watches and phones that you carry everywhere, banking simply becomes both embedded and ubiquitous. But let's be clear—it is not the bank products of today that will ultimately become embedded in this smart world. Only the purest form of banking utility.

When it comes to this new augmented world, banks are significantly disadvantaged over the real owners of utility, and they must constantly jostle for a seat at the new table. The utility today isn't via a branch or an ATM, but the smartphone, the IP layer, data, interfaces and AI.

In this emerging world of instant payment utility, for example, the artifacts and products we associate with payments today—hard currency, cheque books[10], debit and credit cards, wire transfers, etc—will simply disappear. Ultimately, they represent only structural *friction* in enabling

payment utility. A good illustration of this is the capability we see emerging in the likes of Amazon Echo[11] or Google Home, where you can now conduct simple commerce and transactions by using your voice. As smart assistants like this get smarter, we're going to delegate more and more of our day-to-day transactional and commerce behaviour to an AI-based agent[12]:

"Alexa, pay my telephone bill."

"Siri, transfer $100 to my daughter's allowance account."

"Cortana, can I afford to go out for dinner tonight?"

"Alexa, reorder me a pair of Bresciani socks."[13]

In this AI and agency-imbued world, utility is the core—products become invisible as they are transformed into everyday, technology-embedded experiences.

In a world where you delegate Amazon Alexa to make a payment on your behalf, triggered by your voice, does the airline miles program you have linked to your credit card make any difference which payment method you choose? I'd argue, absolutely not. Once you have configured Alexa with your preferred payment method, the improved utility will simply demand more and more transactions go through that account—you won't stop a voice transaction to get your physical card out and read 16 digits to Alexa. The promise of rewards simply won't be enough to disrupt that core payment utility.

Amazon, Apple, Facebook, Alibaba and others, own those layers of technology that deliver experiences and utility today. Banks are already being forced to submit to app store rules just to be a part of their ecosystem. If you're a bank that does a deal with Uber or Amazon to provide some sort of bank utility to an Uber driver or an Amazon small business, you have the advantage of access and scale, but you no longer "own the customer". It's no longer about having a building on the High Street or a piece of paper you can sign, it's about the most efficient delivery of banking to the customer in real-time.

We've been hearing about the threat of the "Facebook of banking", the "Uber of banking", or the "Amazon of banking" for many years now, but if you step back from the hype, we've already seen the emergence of new *first principles* competitors.

A bank that is always with you

In a host of countries around the world you can instantly sign-up for a bank or mobile money account on your phone in minutes. In countries like China, Kenya, Canada, US, UK, Australia, Thailand, Singapore, Hong Kong and throughout Europe you can pay by simply tapping your phone or scanning a bar code. You can send money to friends via the internet instantly in more than 190 countries today[14]. You can pay bills in real-time and increasingly just let your phone or bank account look after those payments for you. Real *first principles* thinking in banking isn't happening in established, developed economies. The real action is in emerging markets or developing countries where legacy is poor.

In 2005 if you lived in Kenya there was a 70 percent chance you didn't have a bank account, nor could you store money safely and it's unlikely you were saving, unless it was under your mattress. Today, if you're an adult living in Kenya there's a near 100 percent likelihood that you have used a mobile money account (stored in your phone SIM), and that you can transfer money instantly to any other adult in Kenya. Today, data shows that Kenyans trust their phone more than they trust cash in terms of safety and utility, with people sewing sim cards into their clothes or hiding them in their shoes so they can more safely carry their money with them. This is all possible because of a mobile money service called M-Pesa, created by the telecommunications operator Safaricom. Today at least 40 percent of Kenya's GDP runs across the rails of their mobile money service called M-Pesa[15].

> We're currently sitting at about 22 million customers out of a total mobile customer base of about 26 million. Now, if you take the population of Kenya as being 45 million, half of whom are adults, you can see we're capturing pretty much every adult in the country. We are transmitting the equivalent of 40 percent of the country's GDP through the system and at peak we're doing about 600 transactions per second, which is faster and more voluminous than any other banking system.
>
> —Bob Collymore, CEO of Safaricom/M-Pesa[16]

The road to 100 percent financial inclusion via mobile wasn't without its challenges. In December of 2008, it was reported in Kenya's *The Star*[17], that a probe instigated by the finance ministry was actually as a result of pressure coming from the major banks in Kenya. By this stage it was already too late for the banks. By 2008, M-Pesa was already in the pockets of more Kenyans than those that already had a conventional bank account. The impact M-Pesa was already having on financial inclusion in Kenya meant the regulator simply wasn't going to shut it down to curry favour with the incumbent banks. Financial inclusion was a bolder ideal than incumbent protection.

Today there are more than 200,000 M-Pesa agents or distributors spread across Kenya. More than every bank branch, ATM, currency exchange provider or other financial providers. Those M-Pesa agents are at the heart of the ability to get cash in and out of the network, but being a part of that network allows them to accept mobile payments for goods and services also. It is not unusual to find M-Pesa agents who have trebled their business since taking on M-Pesa, or those that see 60–70 percent of in-store payments being made via a phone. On average, the central bank estimates that the average Kenyan saves 20 percent more today than the days prior to mobile money.

Figure 4: M-Pesa is a first principles approach to financial inclusion.

Kenya isn't the only one to have found the mobile to be transformational for financial access. Today there are more than 20 countries[18] in the world

where more people have a value-store or account on their mobile phone than via a traditional bank. In sub-Saharan Africa, a population of close to 1 billion people is amongst the least banked population in the world, with less than 25 percent of them having a traditional bank account. However, today more than 30 percent of them already have a mobile money account, and that is growing year-on-year by double digits. If you wanted to bank these individuals in the traditional way, you'd need to get them to a bank branch and they'd need a traditional form of identity. Research by Standard Bank in 2015 showed that 70 percent of these so-called "unbanked" people would have to spend more than an entire month's salary just on transportation to physically get to a branch. Branch-based banking was actually guaranteeing financial exclusion for these individuals.

The introduction of mobile money accounts has also had a profound effect on the banking system. The big banks that once plotted to kill M-Pesa have found incredible opportunities for expanding their horizons.

> When I took this job two years ago my vision was that we were not delivering the experience the customers were asking us to, we were stuck in the traditional mode of asking customers to come to the branch. I wanted an account where you can use your mobile device to get our services. So when we started [working with M-Pesa] we had a target to reach 2.5 million customers in one year, but then in just one year we had already reached 7.5 million customers. We had kind of broken all the goals that we set up for ourselves...our credit products have already done $180 million so far.
>
> —Joshua Oigara, CEO of Kenya Commercial Bank[19]

Kenya Commercial Bank quadrupled their customer base from just over 2 million customers to more than 8 million customers in just two years by deploying a basic savings and credit function on top of the M-Pesa rails. A 124-year-old bank that took 122 years to reach its first 2 million customers, and just two years to reach the next six million. That's all thanks to mobile. Another Kenyan bank, CBA, had equally as impressive results, going from just tens of thousands of customers to more than 12 million

today, thanks to their M-Shwari savings product that they launched on top of the M-Pesa rails. Pre M-Pesa just 27 percent of the Kenyan population was banked; today almost every adult in Kenya has a mobile money account. That is a revolutionary transformation.

While M-Pesa's effect on financial inclusion has been nothing short of phenomenal, the really big numbers aren't happening in Africa, they're happening in China. The transaction volume of Chinese mobile payments reached 10 Trillion[20] Chinese yuan (US$1.45 trillion) in 2015[21], and they reached 112 trillion yuan (US$17 trillion) in 2017. In comparison, the equivalent figure for mobile payments in the United States stood at a meager US$8.71 billion in 2015[22] and US$120 billion in 2017, less than 0.1 percent of China's traction. Even though the US is expected to approach $300 billion on mobile payments in 2021, they're still not even within shouting distance of China in terms of per capita volume, transaction volume or mobile payments adoption rates. In 2018, China's mobile payments activity will overtake global plastic payments—that's the scale we're talking about. That meteoric growth is down to several factors, but most notably because China is today dominated by non-bank payments capability on mobile that has massive, massive scale due to non-bank ecosystems.

By the end of 2015 more than 350 million Chinese were regularly using their mobile phones to purchase goods and services that exceeded 750 million in 2017. Alipay is handling a huge portion of that traffic, making it the world's largest payments network by a wide margin, but WeChat Pay exceeded both Mastercard and Visa in transaction volume in 2017 as well. To help you understand how much larger Alipay is than conventional payments networks, in 2015 Visa reportedly peaked at 9,000 transactions per second across their network, while Alipay delivered 87,000 transactions per second at peak—almost ten times that of Visa. Alipay is now available in 89 countries across the globe, and Jack Ma is expanding that rapidly. On 11 November 2017 alone, Alipay settled RMB 159.9 billion (USD $25.3 billion) of gross merchandise volume (GMV) through its network—84 percent of that via mobile handsets.

Given that PayPal, Apple Pay, Android Pay and Samsung Pay hit USD $9 billion in mobile payments volume for the same year, the US is significantly

behind China. Visa's market cap today is $260 billion. In comparison Ant Financial (Alipay's parent company) looks like a huge buy opportunity right now, with a valuation at their last investment round of approximately $150 billion[23]. The mobile payments market in China is growing at 40–60 percent year-on-year and Ant Financial (Alipay) and Tencent (WeChat/WePay) claim more than 92 percent of that volume today[24]. Yes, you read that correctly, 92 percent of mobile payments in China are handled by two tech players—not by UnionPay, Mastercard, Visa, Swift or the Chinese banks. By tech companies. In Q1 of 2017, mobile payments accounted for 18.8 trillion yuan (US$2.8 trillion) in China, and they finished out the year with a staggering US$17 trillion in volume.

Ant Financial has demonstrated better than any other company in the world, with the possible exceptions of Starbucks[25] and WeChat, the ability to leverage mobile for deposit-taking and payments. In 2017, Alipay, through their Yu'e Bao wealth management platform, managed $226 Billion in AuM (and growing)—all via mobile and online channels. Alipay has no physical branches for taking deposits. It is the largest money market fund in the world today[26] beating out JPMC's US treasury bond market fund. Yu'e Bao has proved that the most successful channel in the world for deposit-taking is not a branch, it's your mobile phone. Something that is only viable using first principles' thinking.

Figure 5: Yue Bao manages more than US $226 billion of deposits today, all through mobile.

This has spurred a mobile deposit and payments war in the Middle Kingdom with Apple, Tencent, UnionPay and Baidu launching their own competing initiatives. WeChat's online savings fund raked in US$130 million just on its first day of operation. The downside for Chinese banks is that now that a quarter of all deposits have shifted to technology platforms, the cost of liabilities and the risk to deposits has increased by 40 percent[27]. Competitors building new branch networks aren't the threat, the utility of mobile and messaging platforms are.

With the largest mobile deposit product in the world, access to more than 80 countries, investments in US-based Moneygram, Korea's Kakao Pay, Philippines GCash (Globe Telecom), Paytm in India and others, Ant Financial is no longer just an internet-based payments network in China. Today, Ant Financial is on track to become the largest single financial institution in the world. Seriously.

Within 10 years, based on current growth, Ant Financial will be valued at more than US$500 billion, and by 2030 it will likely be approaching $1 trillion in market cap value. This would make it four times bigger than the largest bank in the world today, ICBC of China. Today, Ant Financial is worth roughly the same as UBS and Goldman Sachs, two of the most well-respected banking players in the world. Ant Financial has a first mover advantage as a true first-principles financial institution built upon the utility of mobile. Ant Financial is not a bank, it is a FinTech, or more accurately a *TechFin* company—a technology company focussed on financial services.

Ant Financial is clearly the 800-pound Unicorn in the bunch, but when you look for first principles in financial services, you see an overwhelming representation by FinTechs, startups, tech companies and pure-plays. I guess that's the nature of it—for an incumbent to go back to first principles they'd have to burn it all down and start again. Even when you look at the more innovative incumbent banks in the world, banks like mBank, BBVA, CapitalOne and DBS, you still rarely see evidence of even an iPhone-type "first principles" product design—it is still vastly skewed towards reducing friction for derivative products; design by analogy again. Products that were essentially created for distribution through physical branches are simply being retrofitted on to digital channels. For example, DBS' Digibank in

India and Atom Bank of the UK are just digital treatments of traditional bank products and services fitted onto a mobile phone—they're derivative. Yes, they are mobile or digital optimized, but the product features and names all remain essentially the same as those you would have received from branches in the past.

For example, we haven't seen incumbent banks come up with a savings capability that isn't APR[28] based, or where interest isn't received in anything but a very traditional manner—with one possible exception. Dubai-based Emirates NBD launched a savings product in 2016 that allowed customers to be rewarded based on physical activity measured via a wearable device that counted steps. Well played, Emirates NBD.

Other examples of first principles approaches to savings have all come from FinTechs. Digit and Acorns are two examples of behaviourally-based approaches to savings—apps that modify people's day-to-day behaviour to save more, not just simply offering a higher interest rate for holding your deposit longer. Fidor was the first bank in the world to launch an interest rate based on social media interactions[29].

We haven't seen the incumbent industry come up with credit products that aren't based on the same models we've seen for hundreds of years. PayPal Mafioso Max Levchin launched Affirm in 2014, which provides credit based on buying patterns, geo-location and behaviour. We've seen Grameen in Bangladesh pioneer micro-credit and Zopa in the UK pioneer P2P lending, but the banks that followed were largely derivative of these pioneers. You don't see banks reinventing credit based on behavioural models.

We have very rarely seen incumbent players abandon their reliance on application form-based credit scoring or reference checks to determine someone's suitability for a loan or credit card. Yet we see startups like Sesame Credit (Ant Financial), Lenddo and Vouch experiment with social-based scoring, and LendUp creating loans that boost credit scores for consumers instead of simply rejecting them.

When it comes to money itself, you can't effectively argue that Bitcoin isn't a first principles approach to the problems of currency, identity and the challenges of cross-border digital transfers. When you look at the money

transfers themselves, you don't see players like SWIFT, Western Union or others using first principles or adapting blockchain (yet) to solve the problem, but you do see M-Pesa, Abra, Ripple and others solving money movement issues with great aplomb.

Distributed ledger technology like the blockchain clearly has the potential to be a first principles platform for a range of things, the most illustrative example being the creation of the DAO or decentralized autonomous organisation. It was the first AI-based company that allowed participants to invest Ether cryptocurrency into Ethereum/Blockchain startups managed purely on a code and consensus basis. Technically the DAO was a stateless, cryptocurrency based, investor-directed venture capital fund, with no risk or compliance officers, no management, and no traditional company structure. You can't argue that this isn't a first principles approach to VC investment.

When you look for first principles approaches to banking you can find plenty of examples, just not amongst incumbent banks. That is the threat.

Is it too late for the banks?

Elon Musk's SpaceX isn't the only company in the world to make rockets today, but it does have the cheapest kilogram-to-orbit platform. Tesla isn't the only electric vehicle in the world, but it is the most widely known and sold, and has reframed the motor vehicle industry with the likes of Volvo and others responding in kind because of Tesla's success. Apple's iPhone isn't the only smartphone on the planet, but it did completely redefine what we considered a phone and personal computing device. Daimler and Benz aren't the only automobile manufacturers in the world, but you don't see horses on our streets today because of their first principles approach to transportation.

Ant Financial, Tencent, Safaricom and thousands of FinTech startups are redefining what it means to bank today. Redefining how people use a bank account, or more accurately a value store that is embedded in their phone.

Bank 4.0, however, will be about more than new value stores, payment and credit utility. Bank 4.0 is going to be embedded in cars that can pay

in a drive-through without the need for plastic, or autonomous vehicles that generate their own income and pay their own road tolls. Bank 4.0 is going to be embedded in voice-based smart assistants like Alexa and Siri, available at your command to pay, book, transact, enquire, save or invest. It is going to be embedded in mixed-reality smart glasses that can tell you, just by looking at something—like a new television or a new car—whether you can afford it. Bank 4.0 is about the ability to access the utility of banking wherever and whenever you need a money solution, in real-time, tailored to your unique behaviours.

The emergence of Bank 4.0 means that either your bank is embedded in the world of your customers, or it isn't. It means that your bank adapts to this connected world, removing friction and enabling utility, or it becomes a victim of that change. The bankers of tomorrow are not bankers at all—the bankers of tomorrow are technologists who enable banking experiences your customers will use across the digital landscape. The bankers of today, the bank artifacts of today, the bank products of today, are all on borrowed time.

Is it too late for the banks? In one sense, yes. This transformation into the semantic, augmented world is happening because of a whole range of technology changes outside of banking, and the constant demand by consumers for the next big thing. The only way banks could hope for first principles NOT to undermine their businesses, is if they could successfully stop all adoption of new technologies like smartphones and voice-based AI. That is patently impossible. Markets that are successful in slowing down the adoption of things like mobile payments become outliers and simply look out of date in a transformed world.

Case in point. Two thirds of the world's cheques today are written in the United States, along with the highest card fraud volume in the world, and as you read earlier the volume of mobile payments in the US is fractional compared with the likes of China. This outlying behaviour is permitted by a system suffused with legacy, payments regulation ruled by consensus, point-of-sale architecture that is a decade behind the rest of the world, and reluctance by incumbents to remove this embedded friction because it will weaken their oligopolies. However, the fact remains: when

it comes to mobile payments, Kenya is a far more advanced economy than the United States. When it comes to financial inclusion, Kenya has done more to improve the lot of its populace in the last 10 years than the US has in the last 50 years through legislation like the Community Reinvestment Act. Indeed, Kenya today has higher financial inclusion than the United States—a mind-blowing and clearly inconvenient statistic.

The US banking system is a macro example of design by analogy versus design by first principles, whereas China and Kenya are becoming the opposite. The more legacy behaviour and regulation your economy has supporting the friction of the old system, the harder it will be for your bank to be 4.0 ready because it forces slow adaptation to new technology. It is why London and Singapore are pushing so hard for regulatory reform in financial services—they know that is how the future centres of finance will be defined in 2030 and beyond.

Ultimately, this fight will occur across the global stage, and the new metric for developed economies won't be things like GDP and economic growth, but the ability to leverage new technologies to become smart economies, the ability to enable automation, investments in smart infrastructure and the ability to capitalize transformation. Banking is a key part of the infrastructure of the global economy, but if your banking system is built on dumb rails, you will find more and more competition coming from offshore, and more and more blockchain and AI-based attempts at rendering you completely irrelevant.

If you're a bank steeped in tradition, run by lots of bankers, with an old core, in a market with tons of regulation, reliant on branch traffic for revenue then, yes, it is very likely too late. A complete transformation of a bank to being a provider of embedded banking utility, driven by behaviour, location, sensors, machine learning and AI, needs more than an innovation department, an incubator, a mobile app and a Google Glass demonstrator video.

Bank 4.0 is about that radical transformation and how the best banks in the world are responding to these shifts, and how first principles competitors are forcing us to think about banking in different ways. Bank 4.0 is about regulators that are rethinking friction, licensing and regulations

themselves. Bank 4.0 is about new capabilities, new jobs and skills that underwrite competencies banks have never needed until now. Bank 4.0 is about the ability of FinTech startups to create transformative experiences faster and cheaper than any incumbent bank could ever do.

If you want to be Bank 4.0 ready, you need to strip your bank back to first principles and rebuild. If not, it's largely just a matter of time before your business is no longer economically viable, especially if you're a bank with under $1 billion in assets. If this prospect scares you, I've successfully whet your appetite for what comes next.

If you're looking for a book that describes how you take your bank from where it is today into the world of tomorrow, then keep reading. This may be your last chance to make the necessary changes to survive through the next decade. Otherwise, feel free to continue the slow decline into obsolescence.

Endnotes

1 2 May 1945.

2 Source: British Ministry of Home Security Statistics from 1939–1945 (http://myweb.tiscali.co.uk/homefront/arp/arp4a.html).

3 As we'll find out later in the chapter, this is the sole mechanism we've used to progress the banking system over the last 100 years.

4 I'm not counting Hyperloop and his LAX-based tunneling machine, purely because they are not yet separate businesses run by Musk.

5 Elon Musk explains "first principles"—https://youtu.be/NV3sBlRgzTI (Source: Innomind.org).

6 ASDS—Automated Spaceport Drone Ship.

7 SpaceX names their ocean drones and landing platforms after ships in Iain Bank's science fiction stories from the world of the "culture".

8 In *Bank 2.0* I was able to find an example of a bank that had done this so judiciously that their online credit card application form asked you to staple proof of income to the form—an electronic form on a screen requiring a "stapled" proof of income.

9 We'll get to branches later—I assure you.

10 As only the US uses the spelling "checks", we'll use the globally accepted anglicised version in this book—cheques.

11 More generally known also as "Alexa".

9 Adapt or Die

Neither RedBox nor Netflix are even
on the radar screen in terms of competition.
—Blockbuster CEO Jim Keyes, speaking to investors in 2008

Disruption is not new. When you look back over the last couple of centuries, you see time and again evidence that incumbents underestimated the impact of change on their industry. In the banking sector today, the huge potential changes we're facing are no longer just focused on front-end user experiences. We're seeing currency, capital markets, wealth management, bank licenses, labour force and economics all under attack from new emerging systems, paradigms and technologies.

I guess the question should be asked, though: when looking at the likes of Kodak, Blockbuster, Borders, Yellow Cabs, record labels and cable TV, when could we have known with certainty that they were going to be disrupted? What are the warning signs, and are there those same indicators for banks and financial institutions today?

The biggest question probably is: why is it, when faced with disruption, incumbents don't react faster? The threat of Amazon to the retail sector has been clear for over a decade, but despite their steady increase in capabilities and reach, incumbents who had plenty of time to plan a response, have mostly been left reeling[1]. It's like a mixture of disbelief in the speed of the change, combined with fear over being disrupted, which often creates a condition like a deer in the headlights of an oncoming vehicle. You know you need to move, but you still get hit anyway.

What are the indicators that banking and financial services, more specifically, are about to be disrupted?

1. Power is consolidated

One of the most typical elements of predicting when an industry is ripe for disruption is imbalance or dominance by a few leading players. When industry behaviour is consolidated amongst a cabal or oligopoly—a few small players that have consolidated vast market share—the likelihood of change is lower, as those incumbents feel they dominate their sector so completely that they are immune to competition. That sort of entrenched behaviour leads to greater incentive to preserve the status quo, especially when it comes to shareholder returns in the medium term.

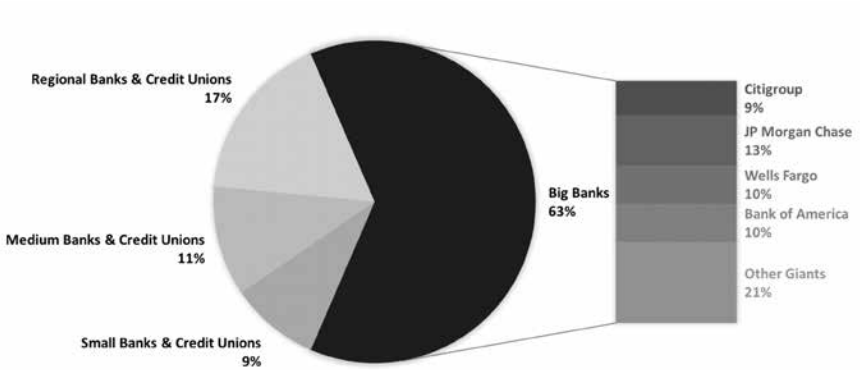

Figure 1: US bank share of assets by type (Source: 2015 Fed Data).

In the US, UK, EU and China banking sectors, this dominance by a few players tends to skew regulation in favour of these larger incumbents who wield enormous power politically. The "too-big-too-fail" movement during the global financial crisis is a simple indicator of the inflexibility of the industry in allowing disruption of these dominant players.

In the US in 1995, US majors held just 22 percent of market share by assets; today that's closer to 70 percent[2]. When consolidation leads to a few players driving the industry, this leads to less likelihood of an orderly transition to new technology states.

2. The industry is inflicted by outdated technology

When Netflix, Borders, Polaroid, Kodak and others went under, it was largely considered a failure of adaptation to emerging technologies. The biggest banks often have the most complex legacy systems, and that makes it difficult for them to implement new technology quickly. Creating a smartphone app seems pretty simple, until you realize you have to deal with your core banking backend and a business model, which requires compliance based on customer signatures on a physical piece of paper.

Figure 2: Transforming a bank is like turning a massive freighter; startups are more like speedboats.

Responding to new, agile disruptors takes extremely flexible technology and organisational structures. The bigger the ship, the longer it takes to turn.

It's not just the 1960s' era core banking systems coded on COBOL. It's the fact that at the very core, most banks still require manual processing and paperwork for account opening, accessing a line of credit or, in the case of cheques, even sending money from one person to another. While some incremental changes are taking place on top of this layer of legacy process and technology, the reality is that when disruptors look at this tech they see an opportunity for disruption. If you still require a signature, you are probably going to get your butt handed to you in this story.

Think about the technology failures at banks of late[3]. Transaction system failures of POS, ATM networks, internet and mobile banking hooked into antiquated back-end technologies that were never designed to cope with the load they're experiencing today. Swift network failures and hacks have also accounted for hundreds of millions in losses. Massive card and credit score database hacks and compromises. Bank-to-bank payments networks that still take three to five days to send your money

from one bank to another. The requirement to see someone in a branch when your account is locked up because of some administrative mistake, or because you simply forgot your password. The requirement to submit 15–20 pages of documentation to open an account and prove your identity. Everywhere these historical processes and outdated legacy technologies make an appearance, we know there is some startup already in the process of attacking those outmoded operations.

3. Trust is still an issue

> I think the public trust in us might take a generation to re-establish itself.
> —Antonio Simoes, UK Chief Executive, HSBC Banking Corp, 2016

According to Gallop research[4] only one in four Americans trust their banks after the global financial crisis. In the UK it's even worse, with just 12 percent of UK respondents having a strong or very strong level of trust in banks. In the EU in general, trust in banks varied between 14 percent (Ireland) to 36–38 percent in the Nordic region. Obviously trust in banks hit a historical low in 2008 during the financial crisis and it has been slow to recover—primarily because banks have not really changed in the minds of customers since the crisis. This lack of trust appears now to have become somewhat embedded generationally in Gen-Zs' and Gen-Ys' attitudes, which significantly lowers the barriers to new competitors emerging and capturing market share.

The argument that a potential technology major[5] or FinTech "doesn't have a banking license" is certainly not a barrier in this environment, where trust in banks is a penalty rather than an asset. The argument that a banking license is some magical standard of trust could not be further from reality today.

I believe trust is essentially a function of utility. The more usable a banking service is and the more the brand demonstrates its effective utility, whether from a licensed institution or not, the more consumers will tend to trust the brand's capabilities.

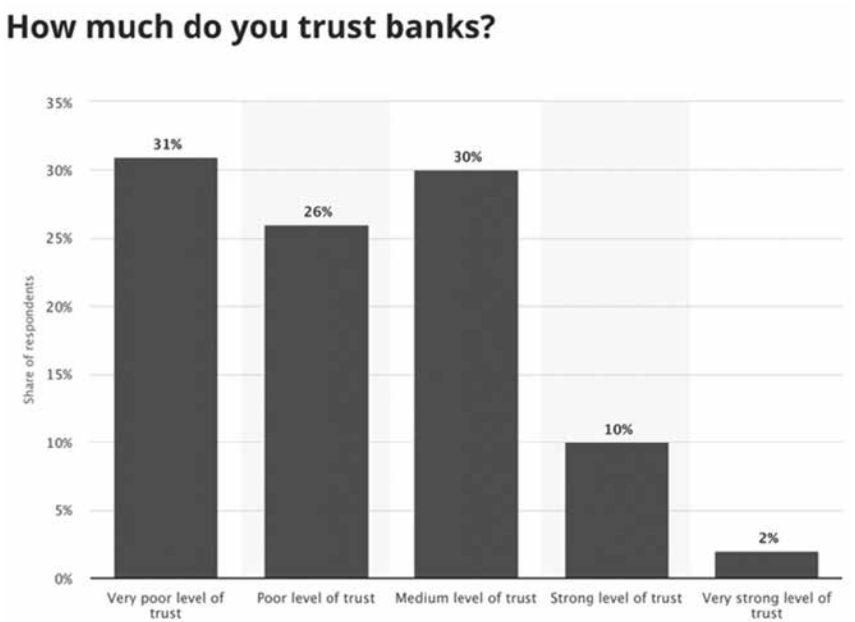

Figure 3: Trust in UK banks (Source: Statista 2018 data).

This explains why in China, companies like Alipay and Tencent WeChat are *actually trusted more* by the majority of consumers than traditional banks. In a survey conducted by E&Y and DBS in 2016, they found that this was a huge contributing factor to the rapid adoption of non-bank services in China[6]. As the interface between the consumer and the brand shifts more and more to daily technology interactions, the primary thing that needs to work is the technology and the utility associated with it. A bank's adherence to regulations to maintain its banking license has very little correlation with customer trust if its technology fails.

Let me illustrate it this way. Imagine you are a global, top 50 bank with billions in assets and locations around the world, and your in-house core system mainframe fails due to some random technology glitch and it takes you a week to get it sorted out. Let's say that fault repeats itself three or four times over the space of a few months. Consumer and small business stories start emerging about individuals having massive issues because they've not been able to pay their bills or employees due to your technology issues. How

much is the fact you've got a banking license or you've had a branch in that town for 50 years going to matter in the consumer trust department?

The fact is, that on newer technology stacks, with more agile cloud-based architectures and an entire business built with technologists at the core, newer players are statistically less likely to have technology driven failures at the customer layer.

4. Despite negative customer sentiment, business practices aren't changing fast enough

Whether you buy into the metric or not, Net Promoter Scores offer an insight into how positive customers perceive the average bank. NPS scores range from -100 to 100. A score over 50 is generally the target, being considered very good to excellent from a customer's likelihood that they'll recommend or "promote" your business. When it comes to banking, NPS averages range from -17 through to 34 globally (depending on geography). But most large banks rank below 20. Amazon, Apple, and Google all perform consistently well above the best banks on NPS.

In recent years, more and more bank CEOs are talking about customer experience as a core competency or driver, but as yet the rubber has not hit the road. Startups like Transferwise, Monzo and Starling in the UK; Betterment, Venmo, Simple and Moven in the US; Revolut and N26 in Europe; Alipay, LuFax and WeChat in China have all grown market share almost exclusively through customer referral and network effect, as opposed to traditional marketing approaches. This shows that these startups still have a basic customer experience differentiation that directly contributes to growth and competitive posture. In the recent British Banking Awards, Monzo and Starling won the awards for best bank based on their superior front-end experiences.

At the core of non-bank, shadow bank or alternative financial services adoption is fundamental changes in distribution mechanics, and it's the biggest concern for incumbents. If you are essentially limited to acquiring customers in-branch, or even if digital acquisition is still less than 30 percent of your revenue pipeline, this is a pretty fair indicator of risk.

About Brett King

Brett King is an international bestselling author, a renowned commentator and globally respected speaker on the future of business. He has spoken in over 50 countries, to more than a million people, on how technology is disrupting business, changing behaviour and influencing society. He advised the Obama White House, the FED and the National Economic Council on the future of banking in the United States, and advises governments and regulators around the world. He appears regularly on US TV networks like CNBC, where he contributes on Future Tech and FinTech.

King hosts the world's leading dedicated radio show and podcast on technology impact in banking and financial services, called Breaking Banks (150-plus countries, 6.5 million listeners). He is also the founder of the neo-bank Moven, a globally recognised mobile start-up, which has raised over US$42 million to date, with the world's first mobile, downloadable bank account.

Named "King of the Disruptors" by *Banking Exchange* magazine, King was voted American Banker's "Innovator of the Year", "the world's #1 Financial Services Influencer" by The Financial Brand and was nominated by Bank Innovation as one of the top 10 "coolest brands in banking". He was shortlisted for the 2015 Advance Global Australian of the Year Award for being one of the most influential Australians living offshore. His fifth book, *Augmented: Life in the Smart Lane*, was a top 10 non-fiction book in North America and was referenced by President Xi in his national address to the Chinese people in January 2018.

King lives in New York and enjoys flying, gaming and scuba diving in his spare time.

About Moven

In 2011, Brett King co-founded Moven as the first US direct to consumer neobank to offer account opening via a mobile app. The app's engaging design helps customers spend, save and live smarter. This innovative approach led to creating global demand from banks to offer Moven technology to their clients, resulting in the firm's transformational Moven Enterprise offering. To learn more visit moven.com or movenenterprise.com.