

A complex network diagram consisting of numerous interconnected nodes and lines. The nodes are represented by small circles in two colors: dark blue and orange. The lines are thin and grey, creating a dense web of connections across the entire page. The overall aesthetic is clean and modern, typical of a technology or finance-related book cover.

The **FINTECH** Book

THE FINANCIAL TECHNOLOGY HANDBOOK FOR
INVESTORS, ENTREPRENEURS AND VISIONARIES

SUSANNE CHISHTI & JANOS BARBERIS

WILEY

"Many are familiar with early stage investing. Many are familiar with technology. Many are familiar with disruption and innovation. Yet, few truly understand how different an animal is the financial services industry. Such vectors as regulation, compliance, risk, handling other people's money, the psychological behaviours around money and capital ensure that our financial services industry is full of quirks and complexities. As such *The FinTech Book* offers a refreshing take and knowledge expertise, which neophytes as well as experts will be well advised to read."

Pascal Bouvier, Venture Partner, Santander InnoVentures

"This first ever crowd-sourced book on the broad FinTech ecosystem is an extremely worthwhile read for anyone trying to understand why and how technology will impact most, if not all, of the financial services industry. It captures and highlights the disruptive forces at play. Start-up FinTech firms across the globe will have a profound impact on the future delivery of services to both institutions and individuals. This book is a terrific compilation of information and prescient thought that should prove useful to both financial services practitioners and users."

R. Todd Ruppert, retired CEO and President of T. Rowe Price Global Investment Services and serial FinTech investor and advisor

"Sometimes a book explains how the world has changed. Rarely, a book comes along that explains how the world is going to change in the future. This is one of those rare compilations that describe the fundamental changes taking place in how people live their lives. It portrays a world where, through a potent potion of technology and entrepreneurialism, power moves away from central banking institutions to local communities and the people within them. This book helps explain why London is the global hotspot for innovation in financial and payment technology. You won't be able to put it down."

Tony Craddock, Director General, Emerging Payments Association

"Finally FinTech is entering the mainstream vernacular such that more than just we finance, banking and payments geeks and innovators are aware of the revolution underway. If you're looking for a 'crash-course' on the FinTech industry, and the explosion of innovation that it's creating across the globe, look no further. The depth and diversity of views herein is staggering; a phenomenal compilation that will get you up-to-speed fast. Definitely worth a read."

Roy Vella, FinTech Expert, Public Speaker and Managing Director of Vella Ventures Ltd

"Fantastic to see a book on FinTech brought together by the community and written by the community. It will be valuable to anyone starting off in FinTech".

Nigel Verdon, Founder, Currency Cloud, Partner, Digital Change

"FinTech is about all of us – it's the future intersection of people, technology and money, and it's happening now there is an explosion of possibilities on our doorstep. Susanne and *The FinTech Book* paint a visual picture of the possibilities and make it real for every reader. A must-read for every disruptor, innovator, creator, banker."

Derek White, Global Head of Customer Solutions, BBVA

"FinTech is reshaping the financial experience of millions of people and businesses around the world today, and has the potential to dramatically alter our understanding of financial services tomorrow. We're in the thick of the development of an Internet of Value that will deliver sweeping, positive change around the world just as the internet itself did a few short decades ago. *The FinTech Book* captures the unique ecosystem that has coalesced around this sector, bringing together visionary entrepreneurs, innovative finance leaders, and forward-thinking policymakers to comment on the exciting changes taking place."

Chris Larsen, Co-Founder and CEO of Ripple

"There are few books out there that capture the pulse of how the internet is changing finance, but *The FinTech Book* has captured the views of many of the key players building the ValueWeb. It will prove an essential read to anyone wanting to know more about the next generation of banking, insurance and finance."

Chris Skinner, Author of ValueWeb and Chair of the Financial Services Club

"Over the next decade, the notion of what a bank is will be turned on its head – where bricks and mortar give way to apps, artificial intelligence, and decentralized ledgers. *The FinTech Book* comes at a perfect time when incumbents, start-ups, and investors alike are trying to grasp what this future holds, for the stakes of getting it right or wrong are truly enormous."

Greg Rogers, Executive Director, Techstars

"*The FinTech Book* provides an excellent open platform to hear from a wide variety of thought-provoking voices. True innovative change only happens with the support of collaborative ecosystems. *The FinTech Book* allows readers to hold this ecosystem in the palm of their hands,"

Liz Lumley, Director of Global Ecosystem Development, Startupbootcamp FinTech and InsurTech

"A truly indispensable guide for anyone who wants to understand the market dynamics of the FinTech revolution and the disruption behind it. Intelligent and thought provoking, you'll either be exhilarated by the scale of the growth opportunities or horrified that your world is going to change so fundamentally."

Dr Louise Beaumont, Head of Public Affairs and Marketing, GLI Finance Limited

“London has established itself firmly as a global powerhouse for FinTech. With the world’s leading international financial centre and Europe’s fastest growing technology hub, London is at the forefront of the latest innovations in financial technology and we are changing the way governments, businesses and consumers manage their financial affairs. We are also a city of great creativity, where new ideas thrive and disruption is welcome. All these ingredients will help London to become the FinTech capital of the world. It is important that we continue to promote the sector and shout about our successes. *The FinTech Book* not only provides valuable insight into the industry from some of the leading experts in London, but also shines a spotlight on what makes London an ideal destination for FinTech companies.”

David Slater, Director of International Trade and Investment, London & Partners

“With many of the contributors to this book we shared the very first FinTech days, back to 2008. In the middle of the hype now, where often noise and relevance are intertwined, I am really happy to see so many meaningful thoughts and opinion pieces about what is certainly one of the biggest pivotal shifts in financial services.”

Matteo Rizzi, FinTech Investor and Co-Founder, FinTechStage

“FINTECH Circle are at the forefront of the latest FinTech developments and innovation, and *The FinTech Book* reflects their open, collaborative and inclusive approach. It offers a unique insight into key trends in this industry to each part of the ecosystem – entrepreneurs, investors and service providers alike will connect with the dynamics captured here. Reaching out to such a wide range of experts provides unprecedented insight into FinTech, making this an interesting read for anyone interested in this space.”

Axel Coustere, Founding Partner, The Hub Exchange

“The FinTech book is a great jumping off point for anyone looking to understand FinTech, especially in Asia. As this new kind of technology becomes more ubiquitous, resources like this book will become more and more valuable to both newbies and experienced hands.”

Vladislav Solodkiy, CEO, Life.Sreda

“This book is a brilliant kaleidoscope of themes, success stories, and current and future trends in the financial technology space. A must-read for anyone who is interested in FinTech, it provides a solid overview of the various ways digital innovation can transform banking and finance.”

Dr Markos Zachariadis, Assistant Professor, Warwick Business School; FinTech Research Fellow at Cambridge Digital Innovation, University of Cambridge

“There is a lot of confusion around what FinTech really is and how it could be deployed by existing financial services companies. This book is well timed as it cuts through the hype and allows the reader to review practical approaches from actual exponents and thereby educate themselves on where different technologies can be applied to their businesses.”

Brendan Bradley, Chief Innovation Officer and Member of the Eurex Executive Board; Chairman of the Executive Board, Deutsche Boerse Asia Holdings Ltd

“*The FinTech Book* really lives up to its title. Janos and Susanne have not just succeeded in explaining the key trends, drivers and implications across a wide spectrum of FinTech themes (including payments, crowdfunding, advisory and cryptocurrencies), but have also clearly laid out the path forward, pragmatically detailing enablers such as regulatory / compliance management, analytic capabilities, and technical competency that are required to effectively capture and monetize the different FinTech disruptions. This is a truly cross-discipline, hands-on and comprehensive FinTech bible, which all players in the FinTech space, including investors, entrepreneurs, incumbent institutions and regulators, can benefit from.”

Robin J. Loh, General Manager, Ping’an FinTech

“FinTech innovation is an important component of economic development, especially for emerging economies. There are few books that summarize the FinTech movement more completely than *The FinTech Book*. It provides a wonderful summary of the global innovation in the industry to date.”

Melissa Guzy, Managing Partner and Founder, Arbor Ventures

“I have a passion for helping businesses invest and grow, and often the key to this is education. At a stroke here is a book that opens up the FinTech world to all who are curious, ambitious and entrepreneurial. FinTech is moving at a tremendous pace and this truly excellent book enables the reader to keep up and even get ahead of how global innovation in financial and payment technology will change and shape the world we live in. The joint editors, Susanne Chishti and Janos Barberis, have done an outstanding job.”

John Davies, CEO, The Just Loans Group PLC

“London is rapidly becoming known as a leading FinTech centre internationally. The development of *The FinTech Book* is timely and innovative, capturing the knowledge of the City’s ecosystem players. It will be a valuable resource for those seeking to understand the implications of these disruptive technologies for the finance landscape.”

Professor Michael Barrett, Cambridge Judge Business School, Academic Director, Cambridge Digital Innovation

The FinTech Book

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The FinTech Book

The Financial Technology Handbook for
Investors, Entrepreneurs and Visionaries

Edited by

Susanne Chishti

Janos Barberis

WILEY

Contents

Preface	viii
About the Editors	x
Acknowledgements	xii

1. Introduction

Banking and the E-Book Moment	6
Why We're so Excited About FinTech	10
Current Trends in Financial Technology	13

2. FinTech Themes

Banks Need to Think Collaboration Rather Than Competition	20
Global Compliance is Key	22
Lending (Capital) in the 21st Century	25
The Next Big Innovation in FinTech – Identity	28
Tech Giants Becoming Non-Bank Banks	31
Design is No Longer an Option – User Experience (UX) in FinTech	34

3. FinTech Hubs

Nurturing New FinTech Communities	42
La (French) FinTech Connection	45
The Journey Towards an Integrated FinTech Ecosystem – The Netherlands	48
Luxembourg, a Future FinTech Hub?	51
Vienna as the No. 1 FinTech Hub in Mobile Payments?	53
India's FinTech Ecosystem	56
Singapore, the FinTech Hub for Southeast Asia	58

4. Emerging Markets and Social Impact

FinTech – The Not So Little Engine That Can	66
Why Am I Not Gonna Be Able to Enter a Bank?	69
The Rise of the Rest in FinTech	72

Smartphones, FinTech, and Education – Helping the Unbanked	75
Reach Financial Inclusion	78
The Social Impact of FinTech in Nigeria	81
India and the Pyramid of Opportunity	

5. FinTech Solutions

Rewiring the Deal – The Path Forward for B2B Supply Chains	88
Payments and Point of Sales (POS) Innovation	92
Predictive Algorithms – Building Innovative Online Banking Solutions	95
Big Data is the Cornerstone of Regulatory Compliance Systems	100
FinTech Solutions in Complex Contracts Optimization	106
Behavioural Biometrics – A New Era of Security	109
Ultra-Fast Text Analytics in Trading Strategies	112
Regulated Crowdfunding Ecosystems	117
Remittances – International FX Payments at Low Cost	120
FinTech Solutions for Small Businesses	123
Payment Solutions Including Apple Pay	125
FinTech Solutions Benefiting other Sectors	128
FinTech Innovation for Wearables	131

6. Capital and Investment

Investment and Capital – Back to Basics	138
Angel Investing – Access to “Smart Money” to Fund the Best FinTech Companies	141
Crowdfunding and Marketplace (P2P) Lending – Online Capital Marketplaces as New Asset Classes to Access Funding	144
The Digital Investment Space – Spanning from Social Trading to Digital Private Banking – A FinTech Sector Made for Disruption?	147
Leading the Way with an Investor-led Approach to Crowdfunding	149

My Robo Advisor was an iPod – Applying the Lessons from Other Sectors to FinTech Disruption	152
Crowdsourced Alpha	155
To Crowdfund a Hedge Fund	160
Providing Capital and Beyond	162

7. Enterprise Innovation

Can Banks Innovate?	170
So, You Think the Innovation Lab is the Answer?	173
FinTechs and Banks – Collaboration is Key	179
Partnerships Are the Key to Addressing Financial and Digital Exclusion	183
Corporate Venture Capital – The New Power Broker in the FinTech Innovation Ecosystem	186
The Insurance Opportunity	190

8. More Success Stories

eToro – Building the World’s Largest Social Investment Network	196
Avoka – An Overnight Success, 13 Years in the Making	198
Bankable – Banking as a Service	201
The Next Chapter in Citi’s Story of Innovation	203
FinTech Trends from the Frontline – Building Collaborative Opportunities for Start-ups, Market Infrastructures, and Wholesale Banks	206

9. Crypto-currencies and Blockchains

FinTech + Digital Currency – Convergence or Collision?	212
Blockchain and Crypto-currencies	217

10. The Future of FinTech

How Emerging Technologies Will Change Financial Services	226
The Future of Financial Services	229
Banking on Innovation Through Data	232
Why FinTech Banks Will Rule the World	235
The FinTech Supermarket – The Bank is Dead, Long Live the Bank!	238
Banks Partnering with FinTech Start-ups to Create an Integrated Customer Experience	241
The Rise of BankTech – The Beauty of a Hybrid Model for Banks	245
FinTech Impact on Retail Banking – From a Universal Banking Model to Banking Verticalization	248
Embracing the Connected API Economy	253
Banking Like Water	258
Eliminating Friction in Customers’ Financial Lives	261
FinTech is the Future Itself	264
A Future Without Money	267
Ethics in FinTech?	270
List of Contributors	273
Index	291

Preface

We both started off delving into the field of FinTech at roughly the same point in time. Eager to learn more, we quickly discovered that there existed no single, consolidated, and authoritative source on the subject. On a remarkably sunny London day, we met up in a local café, ascertaining our mutual passion for FinTech and our desire to find out more. Typically of entrepreneurs, we decided to fill the currently existing gap in FinTech knowledge and produce a FinTech book ourselves, a book that would provide food for thought to FinTech newbies, pioneers, and well-seasoned experts alike. This is how *The FinTech Book* was born.

The reader will notice that this is the first “globally crowdsourced” treatment of the subject. The reason we decided to reach out to the global FinTech community in sourcing contributors for the book lies in the inherently fragmented nature of the field of Financial Technology. There was no single author, organization, or indeed region in the world that could exhaustively cover all the facets and nuances of FinTech. What is more, by being able to call upon a truly global contributor base, we not only stayed true to the spirit of FinTech, making

use of technological channels of communication in reaching out to, selecting, and reviewing our would-be contributors, we also made sure that every corner of the globe had the chance to have its say. Thus, we aimed to fulfil one of the most important purposes of *The FinTech Book*, namely to give a voice to those that would remain unheard, those that did not belong to a true FinTech community in their local areas, and spread that voice to an international audience. We have immensely enjoyed the journey of editing *The FinTech Book* and sincerely hope that you will enjoy the journey of reading it, at least as much.

More than 160 authors from 27 countries submitted 189 abstracts to be part of the book. We asked our global FinTech community for their views regarding which abstracts they would like to have fully expanded for *The FinTech Book*. From all these potential contributors, we selected 86 authors who have been asked to write full chapters, which have now been included in this book. We conducted a questionnaire among all our selected authors to further understand their background and expertise.

Education of our Authors

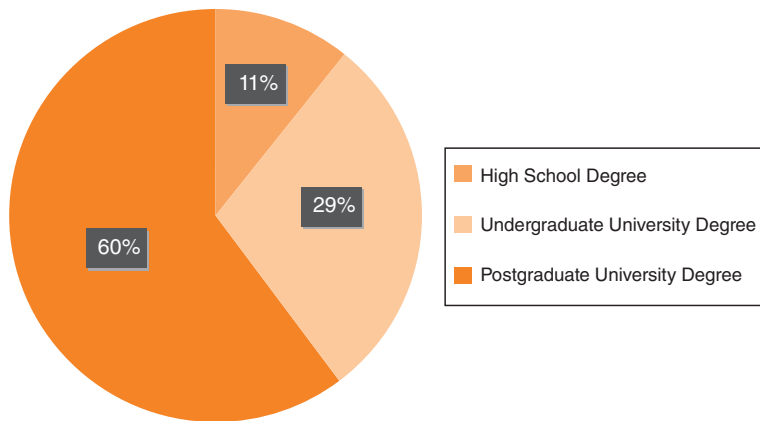


Figure 1: What is the highest educational qualification of our authors?

Expertise of our Authors

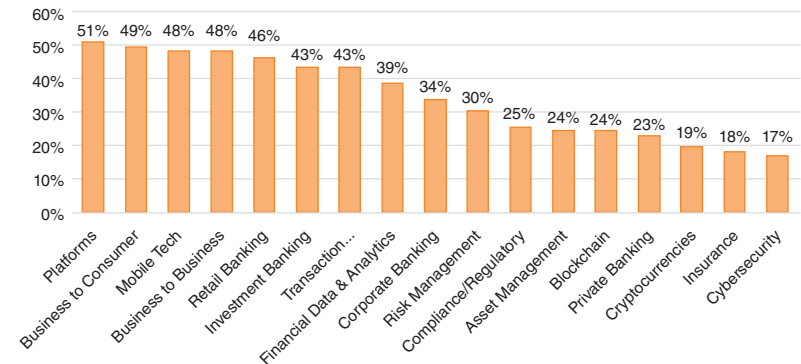


Figure 2: Areas in which our authors have domain expertise (multiple choices were possible)

Where do our Authors work?

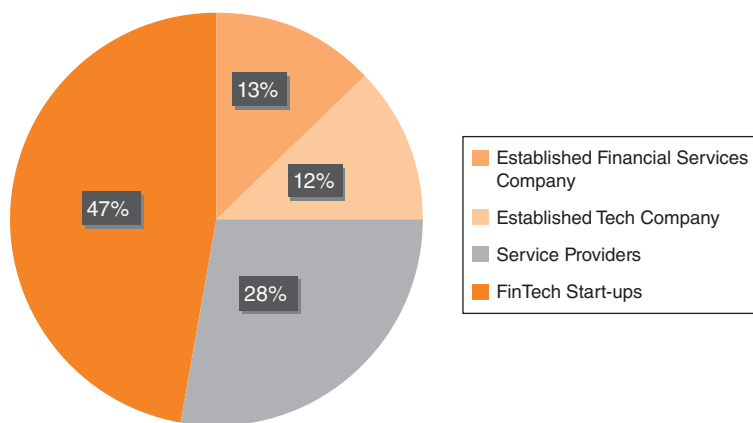


Figure 3: Type of company in which our authors were working

Our selected final authors come from 20 countries. The majority have postgraduate university degrees (60%) (Figure 1), strong domain expertise across many fields (Figure 2), and 93% of our finalist authors have had articles published before.

Figures 3 and 4 show that almost half our finalist authors are entrepreneurs working for FinTech start-ups (many of them part of the founding team), a quarter come from established financial and technology companies, and another quarter from service providers such as consulting firms or law firms servicing the FinTech sector.

Almost a fifth of our authors work for start-ups with up to five people and another 55% for start-ups/small and medium-sized enterprises (SMEs) of up to 100 people. 17% of our contributors are employed by a large organization of more than 1,000 employees.

In summary, we are very proud of our highly qualified authors, their strong expertise, and passion for FinTech through being either entrepreneurs or often

Size of Companies where our Authors work

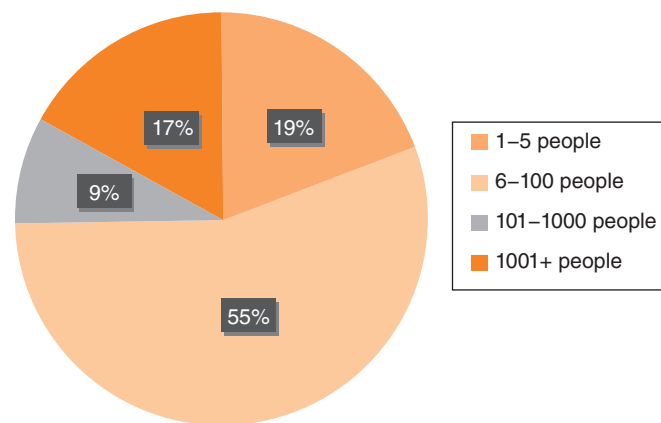


Figure 4: Size of companies for which our authors work

“intrapreneurs” in large established organizations who all are committed to play a significant role in the global FinTech revolution. These remarkable people are willing to share their insights with all of us in these pages.

Firstly, this project would not have been possible without the dedication and efforts of all contributors to *The FinTech Book* (both those who submitted their initial abstracts for consideration by the global FinTech community, as well as the final authors whose insights you will be reading shortly). In addition, we would like to thank Inna Amesheva, Suki Jutla, and Maya Petersohn for their invaluable help in the final stages of the editing process. Last, but certainly not least, we would like to thank our editors at Wiley whose guidance and help ensured that the project which started off as an idea in a London café has become the book which you are now holding in your hands.

Susanne Chishti and Janos Barberis
The FinTech Book Editors

About the Editors

Susanne Chishti

Susanne Chishti is the CEO of FINTECH Circle, Europe's 1st Angel Network focused on FinTech investments, founder of London FINTECH Tours, and Chairman of FINTECH Circle Innovate. Selected as one of the 100 leading Women in FinTech and top 15 FinTech UK Twitter influencers, she was recognized in the European Digital Financial Services 'Power 50' 2015, an independent ranking of the most influential people in digital financial services in Europe.

Susanne is a senior capital markets manager, entrepreneur, and investor with strong FinTech expertise. She is a mentor, judge, and coach at FinTech events such as SWIFT InnotrIBE, Barclays TechStars Accelerator, Cambridge Judge Business School, and Startupbootcamp FinTech Accelerators. She has more than 14 years' experience across Deutsche Bank, Lloyds Banking Group, Morgan Stanley, and Accenture in London and Hong Kong. Selected among top UK FinTech Influencers by City A.M. Susanne is also the author of FinTech articles and an international keynote speaker at FinTech conferences. She runs one of the leading online FinTech communities of FinTech entrepreneurs, investors, senior management from established financial and tech firms, and thought leaders – FINTECH Circle's LinkedIn Group with more than 10,000 members worldwide.

You can follow Susanne on Twitter via her account @SusanneChishti.

About FINTECH Circle

Founded by Susanne Chishti, FINTECH Circle is an international brand linking the FinTech ecosystem of investors, entrepreneurs, business leaders, and influencers who all are enthusiastic about the growing FinTech sector globally. In addition to accessing top FinTech investment opportunities via the Angel Network, members also enjoy knowledge sharing amongst peers, access to board and non-exec positions in FinTech companies, and the opportunity to

attend exclusive FinTech and angel investment educational seminars (www.fintechcircle.com). In addition, London FINTECH Tours (www.fintechtours.com) provide non-UK FinTech entrepreneurs with the opportunity to visit London to leverage London's FinTech ecosystem of investors and clients to help them grow their business. FINTECH Circle Innovate (www.fintechcircleinnovate.com) was set up in response to demand from growing numbers of banks and large institutions who needed help to close the gap between corporate strategy and sustainable innovation in FinTech. We guide them through the global FinTech landscape and are able to source the best targets for partnership, incubation, investment and acquisition purposes. You can follow FINTECH Circle on Twitter via @FINTECHCircle and @FINTECHTours, and FINTECH Circle Innovate via @FTCIinnovate.

Janos Barberis

Janos Barberis is a Millennial in FinTech, recognized as a top-35 global FinTech leader. His expertise is focused on the new regulatory considerations raised by the development of FinTech. With a passion to drive change, he founded FinTech HK, a thought leadership platform, and the SuperCharger – a FinTech Accelerator that strategically leverages Hong Kong as a gateway to Asia.

In parallel, he sits on the advisory board of the World Economic Forum's FinTech Committee and is a PhD Candidate at Hong Kong University Law School. Janos regularly delivers Keynote speeches and has been featured in *Forbes*, *The Financial Times* and *Business Insider*, among others. He is also the Co-Founder and Editor of *The FinTech Book*.

Previously, Janos was the first hire at a prospective UK challenger bank, Lintel, helping it to secure a banking license from the PRA and FCA. This role followed a specialist interest, developed over 7 years, in financial systems and their stability. Notably, in 2012 Janos proposed to reform the Chinese shadow banking sector by developing P2P lending channels. He also introduced a framework of developing

real-time and dynamic regulatory supervision models for financial networks, paving the way towards what is now regarded as RegTech.

Janos holds an LLM in Corporate and Financial Law (HKU) as well as a BSc in Economics & Finance and an LLB in Law (UK). He has been awarded a Research Postgraduate Scholarship from Hong Kong University Law School. He co-authored the academic paper, "The Evolution of FinTech" which ranked within the Top 10 of SSRN globally.

You can follow Janos on Twitter via his account @JNBarberis

About FinTech HK

Founded by Janos Barberis in July 2014, FinTech HK is a thought leadership platform that has the objective of catalysing Hong Kong's position as a world-leading FinTech Hub. FinTech HK produced Hong Kong's first FinTech Report: "The Rise of FinTech: Getting Hong Kong to Lead the Digital Financial Transition in APAC."* Since then, the platform has hosted and supported a number of local and international FinTech events. FinTech HK is a main supporting organization of the SuperCharger, Hong Kong's first home-grown FinTech accelerator dedicated to both early- and late-stage companies that are scaling within Asia.

* The report is available on: <http://www.slideshare.net/FinTechHk/fintech-hong-kong-report>.

Acknowledgements

xii

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When we started discussing our desire for a book which would summarize the global FinTech sector in an easy way, it was just an idea between two people. From that moment onwards we spoke to hundreds of our FinTech friends globally and everybody supported the idea. FinTech entrepreneurs across all continents were eager to share their powerful insights. They wanted to explain the new business models and technologies they were working on to change the world of finance. FinTech investors, “intrapreneurs”, innovation leaders at leading financial institutions and thought leaders were keen to describe their embrace of the FinTech revolution. Finally, many FinTech visionaries wanted to share their vision for the future.

This global effort of crowdsourcing such insights is a world first. We are aware that this would not have been possible without the FINTECH Circle and FinTech HK global communities. We are very grateful to our members who have been with us since 2014 when both groups were created. Our FINTECH Circle Group on LinkedIn has more than 10,000 members globally and all readers of the book are invited to join and continue the conversation online. We also want to thank our 20,000 Twitter followers across our Twitter accounts @FINTECHCircle; @FinTechHK; @FTCIinnovate; @FINTECHTours; @SuperChargerFT; and of course our dedicated Twitter account @TheFINTECHBook. Without the public support and engagement of our global FinTech community this book would not have been possible.

The authors you will read about have been chosen by our global FinTech community purely on merit, thus no matter how big or small their organization,

no matter in which country they work in, no matter if they were well known or still undiscovered, everybody had the same chance. We are proud of that because we believe that FinTech will change the world of finance forever and the global FinTech community is made up of the smartest, most innovative and nicest people we know. Thank you for being part of our Journey. It is difficult to name you all here, but you are all listed in the directory at the end of this book.

We also wanted to select the best publisher for the book and we have chosen Wiley to allow readers globally to buy their hardcopies or order online. A special thanks goes to our fantastic editor Thomas Hyrkiel who saw the vision for the book from the moment we met. Thank you and to your team – we could not have done it without your amazing support!

We look forward to hearing from you. Please visit our website www.TheFINTECHBook.com for additional bonus content from our global FinTech community, consisting of the top FinTech entrepreneurs, investors, intrapreneurs and FinTech visionaries!

Please send us your comments on *The FinTech Book* and let us know how you wish to be engaged by dropping us a line at info@thefintechbook.com

Susanne Chishti
Twitter @susannechishti

Janos Barberis
Twitter @JNBarberis

Introduction



Financial Technology or FinTech is one of the most promising industries in 2016. The FinTech revolution, driven by a wave of start-ups with innovative new business and revenue models, new products and services, is changing finance for the better globally. These FinTech firms offer users a range of financial services that were once almost exclusively the business of banks. Should banks be afraid of the FinTech boom?

At the end of 2015 *Forbes* concluded:

The banking industry is ripe for change with the rise of fintech startups, the growing popularity of blockchain technology, and the dominance of millennials. The industry is evolving and the ever-increasing need to prepare for cybersecurity threats remains top of mind, as banks continue evaluating new threats and potential fraud risks.¹

This introduction provides a broad overview of the Financial Technology sector by setting the scene and explaining what is actually meant by “FinTech”. These chapters serve as stepping stones paving the way towards the more specific topics that are covered in greater detail in *The FinTech Book*.

¹ *Forbes*, 20 November 2015: “Millennials and FinTech are Top of Mind for Traditional Banks”, <<http://www.forbes.com/sites/franksorrentino/2015/11/20/heard-at-the=2015-ABA-national-convention/>>.

Banking and the E-Book Moment

By Warren Mead

Partner, Head of Challenger Banks and Global Co-Lead FinTech, KPMG

Cast your mind back to 2007, the year that saw the launch of the first-generation Kindle. At that time e-readers were widely available in electronics stores but there was no real indication that a revolution was about to sweep the publishing industry. The merits of the e-book were widely discussed by book buyers, but the printed word still reigned supreme – digital consumption was very much a minority sport.

Fast-forward to the present day and both readers and publishers are in a very different place, and sales of e-books have rocketed. According to figures published by Statista,¹ the US digital book market was worth just US\$0.27 billion in 2008, but by 2015 that figure had risen to \$5.69 billion. Physical book sales haven't collapsed; what we have seen is digital publishing taking a rapid route from the periphery of public consciousness to the mainstream in less than 10 years. The e-book is now part of our lives. It's a journey that reflects the willingness – and eagerness – of consumers to embrace convenience even where this is made possible by complex new technologies, delivery channels, and business models. And this journey is currently being echoed in the financial services industry.

The Shifting Financial Landscape

The world's major retail banks still dominate the financial services landscape, providing the deposit, payment, and credit facilities that we all use and take for granted, but they are no longer the only players in town. Today's online shopper might pay with a debit card but equally they might choose PayPal. The business that would once have relied on its bank for credit can now borrow from peer-to-peer (P2P) platforms or specialist lenders. And digital banks are vying with their bricks-and-mortar counterparts for customer deposits. It's all about access and convenience.

¹ Revenue from e-book sales in the United States from 2008 to 2018 (in billion US dollars), <http://www.statista.com/statistics/190800/ebook-sales-revenue-forecast-for-the-us-market/>.

As alternative finance gains traction with customers, FinTech is approaching its e-book moment – the point at which a critical mass of consumers and business customers see the technology-driven solutions offered by new players in the marketplace as a viable – and often preferable – alternative to the services offered by incumbent banks.

The implications for the traditional banking industry are immense. Developments in FinTech have the potential to erode the brand equity of the incumbent players and eat into market share. But banks also have an opportunity to embrace FinTech innovation and offer new solutions to their customers.

An Unfinished Revolution

Anyone seeking evidence of the potential market power and reach of technology-driven finance providers need look no further than the now venerable PayPal. Launched in 1998, the company was taken over by eBay in 2002 and became the default payment system across all of the online auction operator's international sites. Since then PayPal has expanded its offering and it now sits alongside debit and credit cards as a payment option on an ever-increasing number of e-commerce sites. Whether that online performance will translate to dominance in face-to-face transactions remains to be seen. Today, the company boasts more than 100 million active accounts and processes an average of US\$315 million in payments every day.²

The payments market is evolving fast and this evolution will chase convenience, speed, and data collation. Witness the initial success of Apple's contactless payment system Apple Pay, which allows consumers to purchase and pay for goods and services simply by placing an iPhone 6 in proximity to a point-of-sale terminal. Apple Pay is just launching in the UK, but it currently accounts for US\$2 out of every \$3 processed by contactless systems in the US.³

One of the single greatest obstacles is ubiquity – the consumer can be faced with a myriad ways to pay. We are now witnessing a global wave to introduce 24/7

² Paypal Company Statistics, <http://www.statisticbrain.com/paypal-statistics/>.

³ Bloomberg, "Apple Sees Mobile-Payment Service Gaining in Challenge to PayPal", 28 January 2015, <http://www.bloomberg.com/news/articles/2015-01-27/apple-sees-mobile-payment-service-gaining-in-challenge-to-paypal>.

real-time bank account-to-account transfers in all the major jurisdictions. This shift, coupled with regulatory reform, will create opportunities for new players to enter the market and provide data aggregation services and payment initiation options to give life to the Internet of Things revolution.

The use of pre-paid cards is also on the rise. A 2012 report from MasterCard⁴ predicts that the market for so-called e-money (cards pre-loaded with cash) will be worth around £822 billion by 2017. If these numbers are impressive, they represent only the tip of the FinTech iceberg.

Borrowing and depositing is also undergoing something of a revolution, thanks in no small part to the emergence of P2P lending platforms. In the UK P2P lending emerged shortly before the financial crisis with the launch of Zopa in 2005. Other platforms such as Funding Circle and RateSetter followed. To date, the industry has lent a cumulative figure of £2.6 billion and the market is growing. Lending in the first quarter of 2015 came in at £459 million, an increase of one-third on the previous three months.⁵ These figures are small when compared to the sums advanced by the big banks but it is a young and rapidly growing market.

Importantly, the P2P market not only provides businesses and private borrowers with a source of cash, it also offers investors and savers a place to deposit cash and earn higher interest rates than in a conventional bank account. Elsewhere, challenger banks – some of them digital only – are also moving in on the deposits market.

Some aspects of FinTech innovation remain well outside the mainstream. Digital currencies, such as bitcoin,⁶ potentially offer an opportunity and means to exchange value, but most would agree that the real value will emerge from the application of the supporting distributed ledger technology. The use of the distributed ledger brings additional value in the recording of non-financial asset ownership and, coupled with digital currency, could provide a platform for future

⁴ 2012 Global Prepaid Sizing Study, commissioned by Mastercard: A look at the potential for global prepaid growth by 2017, <https://www.partnersinprepaid.com/pdf/a-look-at-the-potential-for-global-prepaid-growth-by-2017.pdf>.

⁵ P2P Finance Association, “Strong Growth Continues in Peer-to-Peer Lending Market”, 30 April 2015, <http://p2pfa.info/strong-growth-continues-in-peer-to-peer-lending-market>.

⁶ For more information on crypto-currencies, blockchain technology, and bitcoin, see Part 9.

innovation to reduce costs and speed up transactions. Effective regulation of this environment is required to reduce risk for all participants.

Move away from the corporate face of FinTech innovation – PayPal, Apple, Google, et al. – and thousands of companies are working in technology hubs around the world on ways to make familiar activities such as stock trading or money transfers not only more convenient, but also more attuned to the way consumers use their smartphones, tablets, PCs, and smart watches. This wave of innovation is not only coming from established FinTech centres but also from emerging hubs. For example, Johannesburg has become a centre for bitcoin development, while across Africa entrepreneurs are developing mobile-based banking and payment systems appropriate to the local telecoms and financial services infrastructures.⁷

The Challenge to the Banks

So how will financial institutions – and particularly the big banks – respond to this wave of FinTech innovation? The banking sector is vulnerable to disruption, partly as a result of recent history. Until the onset of the financial crisis, banks enjoyed a degree of public trust that was crucial to their brands. Although that trust hasn't been entirely eliminated, it has certainly been eroded. As a study by the CCP Research Foundation revealed in June 2015, the world's top sixteen global banks have, between them, incurred US\$306 billion in conduct-related costs since 2010.⁸

In contrast, the leading lights of the digital era tend to be viewed positively. Research carried out for the Millennial Disruption Index report found that 73% of respondents (teens to mid-thirties) would be much more excited about a new financial service delivered by Google or Apple than one announced by their incumbent bank.⁹ In that respect, traditional financial service providers are at risk. Customers no longer necessarily see the bank as the default provider or first port of call – what's out there in the market is more exciting. And what's out there in the market is trading heavily on the toes of incumbents. So, while individuals and businesses will always need banking services, will they still need banks?

⁷ For further insights regarding emerging and established FinTech hubs, see Part 3.

⁸ Financial Times, “Banks' Post-Crisis Legal Costs Hit \$300bn”, 8 June 2015, <http://www.ft.com/cms/s/0/debe3f58-0bd8-11e5-a06e-00144feabdc0.html#axzz3eT1XUB4B>.

⁹ Millennial Disruption Index, <http://www.ritholtz.com/blog/2015/04/millennial-disruption-index/>.

At the most simple level, retail banks provide three crucial functions, namely:

- They take deposits and provide customers with a secure place to store cash and earn interest, backed by deposit insurance and significant regulation.
- They facilitate payments through a range of systems, including cash, cards, and transfers.
- They lend money.

To a financial services agnostic the same services can be provided by the new generation of technology-driven challengers. In terms of retail banking, money can be deposited with challenger banks, placed in pre-paid cards, stored in PayPal accounts, invested in bitcoins, or invested through P2P lending sites.

Credit is available from challenger banks and alternative lenders (including P2P), and customers have an increasing choice of payment options, including PayPal, e-wallets, and phone-based systems. While many of these options still use the plumbing of the banking system, in the medium term we may see payment and foreign exchange mechanisms that completely bypass the incumbent banking systems.

The Utilities Risk

So the major risk for the incumbents is that they come to be perceived as utilities that do little more than supply the infrastructure while the FinTech companies take the credit for providing innovative consumer-friendly services – and ultimately own the customer relationship. When this happens, the brand equity of banks will surely take a hit.

Unlike the major banks who are often constrained by legacy IT systems and operating models, the new players have designed their digital services from the ground up to meet the needs of specific customer groups. FinTech challengers can be both agile and completely focused on positive customer outcomes.

While traditional banks are dealing with increasing layers of compliance, consumer protection, and their own bureaucratic structures, P2Ps have a transparent approach to borrowing and lending, based on disclosure by the company seeking credit, and assessment by the community of lenders (rather than faceless credit

committees). This approach speaks to a generation raised on social media and these lenders regularly score high on customer satisfaction. Equally important, P2P sites have lower operating costs than banks and the capital requirements they face are also lower.

The Future for the Banking Sector

BBVA chairman and CEO Francisco González forecast in early 2015 that up to half of the world's banks will disappear through the cracks opened up by digital disruption of the industry.¹⁰ That may be so, but I would argue that the most forward-looking banks will not just survive the wave of digital disruption, but will thrive, as these FinTech-driven challengers gain momentum. The world's major retail banks enjoy huge advantages, not least in terms of their collective customer base and the data they hold on their clients. These "thrivers banks" will migrate the majority of their customers to their own digital banking services. They will reposition themselves in the value chain from being a provider of infrastructure and product, to being at the heart of the customer relationship in a secure and holistic digital environment. In effect, they will become financial app stores showcasing a range of financial solutions from different providers. In doing so, they remain relevant to customers as a single source for the best global financial solutions.

So, in the future, once I have logged into my mobile bank (presumably using heart biometrics or face recognition) I will be able to borrow money P2P via Ratesetter, make an international payment using Transferwise, top up my Starbucks e-wallet, or make a deposit into my Alibaba money market fund. In order to achieve such a goal, collaboration will have to become the norm. Corporate incumbents can't match the speed to market and the ability to innovate that the best FinTech developers bring to the table. So, rather than trying to reinvent the wheel by developing their own solutions, banks will have to work with innovators to bring new services to their consumers.

From start-ups working in shared spaces in London's Tech City or Johannesburg, to the corporate giants such as Apple and Google, FinTech is a dynamic sector. But while market leaders have emerged, no one really knows where the next successful payment system or bitcoin wallet will come from. And for all those ideas that make it to the market, many others will fail. The services that succeed will be those that

¹⁰ Half of the world's banks set to fall by the digital wayside – BBVA, <http://www.finextra.com/news/fullstory.aspx?newsitemid=26965>.

genuinely make life easier, perhaps by mixing FinTech with other technologies. The bank of the future could be a place to deposit not just your money, but other valuables – for example, your medical records, your will, or the biometric data used to start your car.

With their customer base and experience in securely handling data, banks are in an ideal position to create holistic customer solutions that combine financial services with a wider range of digital offers. It could be the key to their future prosperity.

Why We're so Excited About FinTech

By **Rébecca Menat**

Director of Communications, The Assets

10 Banks are not exciting – FinTech is. Why should we be excited about the global FinTech sector?

INTRODUCTION

Here is some background information for novice readers: FinTech means “financial technology”. It encompasses a new wave of companies changing the way people pay, send money, borrow, lend, and invest. The most disrupted sectors – or at least the ones that we hear the most about – are payments and money transfer, with TransferWise (money transfer), Square (mobile payments), crowdfunding (Kickstarter, Crowdcube, Smart Angels ...), and peer-to-peer lending (LendingClub, Zopa, Prêt d'Union ...) increasingly becoming household names and products. So where is all this exciting activity taking place? London is clearly the leading FinTech hub, followed by New York, and other cities fighting to get to the top: Paris, Hong Kong, Singapore, Tel Aviv ... Just to give you an idea, FinTech investments reached \$22 billion (including \$4 billion insurance) in 2015 and are expected to increase significantly, so there is room for new players!

How Did it all Begin?

The birth and rise of FinTech is deeply rooted in the financial crisis, and the erosion of trust it generated. People's anger at the banking system was the perfect breeding ground for financial innovation. Good timing, because digital natives (a.k.a. millennials) were becoming old enough to be potential customers and their preferences pointed to the mobile services they understood and mastered, instead of bankers they could not relate to. In this favourable landscape, FinTech providers came in, offering new and fresh services at lower costs, through well-designed platforms or mobile apps.

To sum it up, FinTech companies offer trust, transparency, and technology. Responding to a trust crisis towards banks, start-ups are able to offer services at a lower cost in a more transparent way, through easy-to-use interfaces. The customer is king and there is no one who knows their customers better than youthful, edgy start-ups, often drawn from the ranks of the millennial generation itself.

More than a Fuss: What Does FinTech Bring?

In four simple words, FinTech means: “Power to the People!” Take money transfers for instance. By allowing transparency and cutting middlemen fees, FinTech start-ups enable individuals to have control over their own money. End-users know how much they pay, and incidentally, this is less than what they used to pay. This innovation is actually having a really big social impact,¹ as there are start-ups specializing in a certain kind of money transfers: remittances (money sent by foreign workers to their home country). WorldRemit and Remitly are attracting serious attention, having respectively raised \$100 million and \$12.5 million in funding. This is not surprising, as they are entering a market worth more than \$600 billion a year.

Another way of empowering people is to provide them with ... money. The financial crisis not only resulted in a lack of trust towards banks – it also made it more difficult for people to take out loans. Peer-to-peer lending has broadened the availability of financing, enabling people and businesses to borrow money more easily, faster, and in a more transparent way. These FinTech start-ups have applied disintermediation to credit, connecting buyers and sellers through marketplaces. At the forefront of this trend stands Lending Club which raised almost \$900 million in one of the largest IPOs of 2014.

FinTech is also widening access to investment opportunities, through crowdfunding.² Let us not forget that equity investment was once restricted to wealthy individuals. It is now accessible to all! If you have a small amount to invest, you can still have an impact and potentially reap some benefits. Kickstarter, Indiegogo, Crowdcube ... just scroll down and choose your project. We already seem to be accustomed to this sector of FinTech, and tend to forget how revolutionary it is. Robo advisors are also shaking up the investment world, extending financial advice to just everybody.³ According to a report by consulting firm A.T. Kearney, these automated investment services will manage about \$2 trillion in the US by 2020, accounting for 5.6% of Americans' investment assets.⁴

¹ For additional insights on the social impact of FinTech, see Part 4.

² For further information on crowdfunding and the impact of FinTech on other sectors, see Part 6.

³ See Part 6 for more information of FinTech influencing investment and capital trends.

⁴ See <http://money.cnn.com/2015/06/18/investing/robo-advisor-millennials-wealthfront/>.

Generally – and I think this is the biggest revolution – FinTech is providing access to information, that once belonged to a select few, to an ever-increasing pool of people. In our “information economy” age, that is a big democratic move.

FinTech in the Developing World: Starting from Scratch⁵

John Chaplin, a payments industry veteran, gathered a bunch of experts to generate insights into the state of the FinTech industry: their conclusions are assembled in *The Payments Innovation Jury Report*.⁶ Among various questions they asked themselves: which region will show the most payments innovation over the next 24 months? Verdict: FinTech innovation will come from Asia for the most part, followed by Africa, North America, Latin America, and eventually Europe. The reason is quite intuitive: the lack of infrastructure in developing countries leaves room for innovation that would not find success in over-banked and heavily entrenched economies in the West. As one of the report’s contributors perfectly sums up, “the developing world is not bound by existing legacy systems, business models or customer behaviors and as such offers a fresher perspective that can often see beyond the scope of established business models.”⁷

In addition, whereas FinTech services in developed countries are focused on online customers, start-ups in developing countries are addressing a broader market: cell phone users. According to the International Telecommunications Union, an estimated 95.5% of the world’s population have access to a cell phone – which gives SMS a greater impact than the internet. Mobile money transfer services such as M-Pesa have made major contributions in changing the economic situation of underbanked populations in Bangladesh and Kenya. In Bangladesh the M-Pesa equivalent is bKash which is focused on mass-market mobile financial services. While Bangladesh offers a strong micro-finance industry (small-scale unsecured credit), bKash works like M-Pesa, sending payments quickly and easily to others.⁸

⁵For further information of the applicability of FinTech solutions to emerging markets and their social impact, see Part 4.

⁶Currency Cloud, “The Insider’s View to Payments and Fintech”, 2015, <https://www.currency-cloud.com/payments-innovation-2015>.

⁷Ibid.

⁸Source: <http://www.totalpayments.org/2014/08/05/bkash-bangladesh-m-pesa/>.

In 2013, International Finance Corporation (IFC), a member of the World Bank Group, became an equity partner in bKash and in 2014, Bill & Melinda Gates Foundation also invested in bKash to ensure access to a broader range of financial services for the low-income masses of Bangladesh to achieve broader financial inclusion.⁹

Looking at the impact of FinTech solutions in Africa it is important to keep in mind that in sixteen African markets, there are now more mobile money accounts than bank accounts.

Thus, FinTech in developing countries is not only about making existing services more convenient: it is creating new infrastructure, and providing for greater inclusion of millions of people in the real economy. Since the markets addressed are enormous – and admittedly represent huge potential opportunities – one can truly say that FinTech is “changing the world for the better”.

Banks, Beware!

FinTech has already unveiled many “disruptions”, and is probably keeping many more under its belt. Is there enough space for these innovative new entrants and traditional institutions alike? What are the concrete threats to the latter?

“People need banking, but they don’t necessarily need banks,” Heather Cox, Citi’s Chief Client Experience, Digital, and Marketing Officer said during IBM InterConnect 2015. New and more convenient and customer-centric services are changing the landscape, while customers are becoming more demanding. No bank can deny this: the proliferation of niche players focusing on certain services makes it more and more difficult for traditional financial institutions to keep ownership of their customers. The time when financial institutions could bundle their services together without transparency and still enjoy full loyalty from their customers, is coming to an end. Admittedly, this phenomenon only applies to a certain generation in certain areas, and even most of my “millennial” peers are still using their bank’s services for all of their financial operations. We are not there yet. Actually, this is probably just the beginning of what is forecast to be a financial revolution.

⁹Source: <http://www.bkash.com/about/company-profile>.

In his annual letter to shareholders in April 2015, JP Morgan's CEO Jamie Dimon raised the alarm: "There are hundreds of start-ups with a lot of brains and money working on various alternatives to traditional banking." In spite of the apparent hegemony of these large establishments, more and more traditional institutions are becoming conscious of the threat innovative players represent. Would it be a smart move to try and beat them? Nothing is less certain. Start-ups have certain advantages over financial behemoths. Their small size, lean culture, technological progress, and ability to attract top talent give them a competitive advantage that is inherent in their very nature.

Disrupted, Reimagined

You know what they say: if you can't beat them, join them. The smartest move is to collaborate, not to compete – and many banks have understood this. They are creating incubators (Barclays' accelerator), setting up specialized venture funds (Santander's Innoventures), creating partnerships (Metro Bank and Zopa), or simply acquiring start-ups. Strategies differ but the goal remains the same: survive, and even profit from the digital disruption.

Yes, the big players will need to abide by start-ups' rules, in some ways. But this may actually be beneficial. What is better than having someone inventing everything right in front of you, and allowing you to just buy it? This is a once-in-a-lifetime opportunity for banks to obtain advanced capabilities and modernize inefficient infrastructure without having to develop it in-house. In other words, it only requires an open innovation mind-set for banks to join the game.

In this context, different scenarios can be imagined. In its report entitled *The Future of Fintech and Banking: Digitally disrupted or reimagined?*¹⁰ Accenture details what it considers to be the most probable ones. Scenario 1: banks continue to believe in the supremacy of their business model and fail to adapt, hence losing out to new players. Scenario 2: they understand the importance of customer experience and embrace innovation within their business model, mainly collaborating with new entrants. The second option seems far more likely, now that banks are expressing their awareness and laying their cards on the table. Let us hope this will result in many win-win situations for the financial service sector and its global customers.

¹⁰ Accenture, "The Future of Fintech and Banking: Digitally disrupted or reimagined?" <http://www.fintechinnovationlablondon.net/media/730274/Accenture-The-Future-of-Fintech-and-Banking-digitallydisrupted-or-reima-.pdf>.

Current Trends in Financial Technology

By Alexandre Glas

Co-Founder and CMO, The Assets

and Marcin Truszel

CEO, Kontomatik

For a very long time now banks have had to compete primarily with other banks. These were the times of mass branch openings, bold marketing campaigns, and ongoing competition for the highest interest paying accounts. In 2015 FinTech became not just “a” buzzword but, arguably, “*the*” buzzword and this shows no signs of changing. Now direct competitive pressure for banks is not only coming from other banks, but from thousands of FinTech start-ups and powerful tech giants with enough capital to cherry pick the most interesting areas of banking to leverage their own business models and millions of customers.

For decades, universal banks have been serving the full scope of financial services. In most countries, competition in the banking sector was moderate, since the bulk of jurisdictions had just a few large banks that accounted for quite a large share of the market. It was thus rarely possible to see a bank that had grown from a small one to a large industry player. While banks try to offer a wide scope of services, there are many innovative FinTech companies that just focus on the development of one simple service with great user experience. This certainly makes the lives of banks harder, as it is simply impossible for a large organization to achieve sustainable growth in every niche of the financial services sector. This development refers to the “unbundling” trend, meaning that FinTech firms focus on distinct areas of banking with the goal to become the “best of breed” providers in these areas. Therefore on an aggregate level there is a danger that the banking service offering overall is “unbundled” by the best FinTech providers in each category.

While the residents of developed countries certainly enjoy doing their banking activities from the comfort of their homes with the benefit of online banking, we can still see that online banking is not widely present or not present at all in emerging markets. However emerging markets will experience quite rapid growth

and substantial improvement in financial services provision. This process should take substantially less time than it took developed markets to achieve. This will be quite a similar scenario to what has already happened with the development of internet networks in such countries. While residents of developed countries have been steadily moving from one type of connection to another, it is not at all unusual to see developing countries quickly jump from a common 56k modem to high-speed wireless connections straight away. In other words, developing countries tend to start and stay on the low-end technology for longer than developed countries; however, they then skip many stages and quickly adopt the most developed product.

Regulation Supporting the FinTech Sector

2015 began with exciting news coming from the United Kingdom, where the government announced the initiation of a data sharing and open data initiative in banking (open Application Programming Interface (API) initiative).¹ UK officials are planning to implement a detailed framework for an open banking data environment that can be used by banks and FinTech companies to collaborate more for the benefit of their customers. The objective is to boost competition for the benefit of consumers. This is an important step, as thanks to the influence from the UK government many innovative organizations could get access to financial data going forward.

Another important piece of legislation in Europe is the Payment Services Directive 2 (PSD II). Although the whole analysis of PSD II is rather complex and beyond the scope of this chapter, in summary the European Parliament also wants to see easier access to banking data to enable innovation while at the same time preventing any data misuse and security breaches.

¹ Source: <https://www.gov.uk/government/consultations/data-sharing-and-open-data-in-banking-call-for-evidence/call-for-evidence-on-data-sharing-and-open-data-in-banking>. The application program interface is a set of routines, protocols, and tools for building software applications. The API specifies how software components should interact. See the chapter entitled “Embracing the Connected API Economy” for further detail about APIs.

Wearables, Foreign Exchange (FX), Bitcoin, and Blockchain Trends

Having reviewed regulation trends, we now want to highlight key applications of FinTech. In the foreign exchange sector, services like WeSwap² are entrants into the currency exchange market, but they are doing things quite differently from the traditional money exchanges – WeSwap actually allows people from different countries to interact and exchange local currency at a pre-determined local rate, far cheaper than the commission traditional money exchange businesses place on exchanges. WeSwap is backed by MasterCard³ and is expected to grow exponentially over the next 18 months.

Although not yet commonplace, smart wearables are set to revolutionize the banking industry. The forecast for shipping wearables in 2015 is 45.7m units⁴ and this is only going to increase. The Apple watch already allows the wearer to check their banking balance, track their transaction history, and find a nearby branch – once the mobile banking transaction systems are expanded and improved, the functionality of these smart wearables will only increase further. Jeremy Mugridge, Marketing Director at Instinct Studios is quoted as saying, “wearables have been around for a while now, but we’re likely to see this gain momentum after the release of Apple Watch. 2015 will be the year where we’ll see a shift in focus from health and fitness towards other areas like people’s financial health.”⁵ For those of you who doubt that smart wearables will become that popular, take a glance at your smartphone and think back 10 years.

It is perhaps no coincidence that after the economic crisis, driven in part by banks, consumers are now paying closer attention to their own finances than ever before. Indeed, several apps have been created to allow consumers to do just that – one app, called Spendific, connects to a user’s bank account and, after taking into account all of their outgoings, states what is left to spend. This is updated in real time as purchases and payments are made from that account. This innovation,

² See <https://www.weswap.com/en/>.

³ See <https://www.weswap.com/en/learn-more/>.

⁴ Ibid., and see <http://www.idc.com/getdoc.jsp?containerId=prUS25519615>.

⁵ “FinTech Trends and Predictions for 2015”, 14 January 2015, <http://www.bobsguide.com/guide/news/2015/Jan/14/fintech-trends-and-predictions-for-2015.html>.

though, is comparatively basic when compared to MoneyHub, who have developed an app that does something similar, but also includes long-term savings in the financial planning process. Things like buying a house and desired retirement age are included and different scenarios can be created to see what impact the consumer’s decisions will have on their financial outlook.

More and more financial services provision is being conducted online and as Generation Z (the demographic segment born after millennials) will only ever know “mobile”, it should come as no surprise that this is and will continue to be the case. Smart wearables, specifically technologically advanced financial apps and an increase in mobile payment opportunities, are the result of consumer demand.

Although they are taking a somewhat slow foothold, there are clear signs that crypto-currencies are here to stay – for example, California made them legal tender in 2015.⁶ In Europe some countries are already seeing bitcoin – an example of a crypto-currency – take hold in bartering-type exchange systems. Arguably, there is not yet a bitcoin usage model quite where the industry needs it to be, but this will be developed over time. However, the development of all of this could be hindered by regulations and national laws. Seen from an idealistic viewpoint, people would be able to use bitcoin, or other crypto-currencies, anywhere in the world, instantaneously. Yet, with different rules and regulations governing states and the different financial institutions involved, getting unanimous agreement on how crypto-currencies should work could prove difficult.

In this respect, blockchain (the technology on which bitcoin is based) is a distributed data store that holds a public ledger of transactions for crypto-currencies, such as bitcoin itself. A dedicated chapter in the book covers crypto-currencies and blockchain technology.

It is clear that FinTech has already made huge inroads into many aspects of our daily lives. What is perhaps even clearer is that the surface has barely been scratched in relation to what FinTech can do for us all in the future. As we consumers become ever more demanding and discerning in our choices, you can

⁶ “Cryptocurrencies made legal in California”, 8 January 2015, <http://www.bobsguide.com/guide/news/2015/Jan/8/cryptocurrencies-made-legal-in-california.html>.

expect to see financial institutions rely increasingly on FinTech developments to provide the solutions to keep us happy and meet our needs.

In summary, we are now living in times of significant transformation of the banking sector. We can probably assume that banking over the next 10 years

will experience a higher degree of change than in the last 100 years. Financial technology innovation has started a global shake-up of the sector. Now the most important question remains: will banks be able to successfully embrace FinTech innovation or not? FinTech is set to play a bigger role in your life than you might have ever expected.

FinTech Themes