

Financial Technology

Financial Technology

Case studies in FinTech innovation

Niels Pedersen



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*To Sophie, for her unwavering
support, and love*

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FOREWORD

The traditional global banking and finance system was once viewed as the backbone of trade and industry. Such governed and centralized financial systems are based upon government-issued (fiat) currencies, where key agents in the system are agreed on the value of cash via stock and local exchanges fuelling transactions and controlling economies. The physical nature of exchange between key agents and brokers excluded the masses from direct participation. Instead, the retail banking segment employed financial managers and experts to offer a portfolio of services to customers in return for interest payments on, for instance, loans and mortgages, etc – a distinct profit motive for the system. Over the centuries, this system monopolized the marketplace, presiding over consumer choice, underpinned by what could be described as a social contract of trust developed between the bank manager and consumer. This signified a mutually productive relationship, packaged as safeguarding customers' financial interests and personal data (hardcopy ledger) while making a profit.

Before the global financial crisis of 2007–09 (GFC), discussions of the incumbent banks' dominant position and breaking of consumer trust would have been scorned for the lack of understanding surrounding the unique and socially embedded manager–consumer relationship. Since the GFC, we have seen a chain of events that gradually unpacked the macro-level centralized (and privileged) position of established financial institutions, revealing dubious trading practices with some reported reliance on under-developed algorithms making spurious transactions. In other words, failing to heed Ada Lovelace's warning: it [the algorithm] can only do whatever we know how to order it to perform. Enter the corporate rationalizers, introducing new technological innovations that challenge the extant system and its foundations, indeed, coining the term 'challenger' banks. Such innovation began to upset the equilibrium of the financial system, opening a pathway to a new decentralized form of exchange that shifts from physical to digital exchange, declaring the rise of the now-familiar financial technology (FinTech) sector.

Today, we live in the 'digital economy', of which FinTech plays a significant role in presenting substantial socio-technological and transformational

challenges from new terminology and skills emerging from computer/data science. This is driving a mounting degree of technological development in enabling consumers greater choice in their financial decisions. The Covid-19 pandemic has reportedly driven acceleration toward a rethinking of our physical transactions with cash, finance and banking to full digitization or a cashless society. Thus, the once-revered discussion with the bank manager has been usurped by a digital ‘bot’ or assistant who can deftly answer those mundane questions about our bank balances or our likelihood of being granted a loan, for example. This socio-technical shift shows a reconceptualization of our social and physical relationship with finance to accessing online platforms. The power over our financial well-being and systems are moving away from larger financial institutions to that of the individual – decentralizing financial control and promoting agility in choice. We have neo-banks, challenger banks and FinTech start-ups disrupting the plethora of services that was once the sole proviso of the financial agents monopolizing access to banking and finance.

How are organizations responding to this transformation of financial services? Simply put, technological innovation and collaboration has arrived and is cited as key for retaining a competitive advantage. Those who choose not to collaborate and engage with this next industrial revolution risk inertia – lacking agility in mindset and structure to adapt which could lead to exiting the marketplace. This is exemplified in the gradual closure of physical bank branches. The truth facing incumbents in banking and finance is: adapt, collaborate or die; although they still retain customer mass over the new challengers, change is afoot.

Moreover, innovation invokes a myriad of digital regulations – albeit some rules and governance are also undergoing digital transformation to maintain pace with FinTech innovation to ensure consumers do not fall foul of malpractice – back to Lovelace’s warning around technology adoption. Yet, moving to a decentralized system is complex: finding a pathway through networks, APIs and new banking platforms (i.e. open banking platforms), and payments regulation. Thus, recognizing that buying off-the-shelf tech solutions without taking people into your network, organization or society with you may cause the profit motive to become unmoored. This is encapsulated in the first example of decentralized finance via distributed ledger technology underpinning blockchain and cryptocurrencies emerging since the GFC from the mysterious Satoshi Nakamoto. The limitations of a centralized system were writ large and the underpinning (almost ‘hippy’)

central tenets focussed on changing the game of finance and decentralizing control over the system.

What has happened with decentralized finance since 2008 and what does this imply for organizations? As discussed, cultural and technical shifts of this magnitude necessitate time: as humans, we generally resist change that is forced rather than owned by us. Therefore, the current wave of innovation moves beyond disruption to signpost a new relationship with finance that will (eventually) benefit the masses. Admittedly, there's work to be done in this sphere, heralded by the Open Banking and finance movements.

Financial Technology provides an encyclopedic guide to the FinTech arena. The use of topical examples helps garner an in-depth appreciation of FinTech innovation while reducing fears of automation. The author embodies boundless thinking and agility tempered with caution over adoption, while celebrating technological innovation – which should not be stifled but balanced by safeguarding individuals' financial well-being. Thus, he addresses the need for financial inclusion across society, whereby ethical access and use of consumer data is central to creating trust in financial innovation, as consumers also adapt to the new digital financial landscape.

Pitched against this backdrop of an evolving digital economy witnessing unprecedented innovation, change and societal challenges, this book captures key aspects of the fluid FinTech landscape while adding to the growing body of knowledge in this emergent field. Thus, the reader is offered methods to navigate through the minefield of decentralized financial innovation and seize aspects to embed within their organizations or facilitate further development across social and technological domains.

Karen Elliott

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on FinTech at Newcastle University Business School, UK,
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the IEEE committee for Ethics, Trust and AI in Society*

PREFACE

Every few years, a new buzzword makes its way into the headlines. From ‘AI’ to ‘Big Data’, and ‘Cryptocurrency’ to ‘DLT’, these terms are used to capture public imagination with grand promises and great expectations. To the cynic, the excitement around new technologies may seem like repetitions of past hype-cycles; however, as digitization accelerates, and re-imagines the way we work, one can no longer remain a luddite. Instead, there is a need for learning and adaptation. This is not a one-off; rather it is a lifelong process. The opportunities of tomorrow belong to the curious.

When looking into new technologies, anyone without a background in computer science will almost immediately face stumbling blocks in the form of jargon. When looking up a new term, it is not uncommon to find oneself confronted with more jargon; in other words, end up with more questions than answers. This is a frustrating feeling, which leads many to give up, perhaps while thinking that ‘technology is not for me’. Furthermore, even when one does overcome the jargon to gain some understanding, there is the feeling of being lost at sea. After all, how does it all fit together?

This book is an attempt to address these problems. It seeks to do so by giving the reader a basic yet thorough understanding of how the most important technologies work, and crucially, contextualizing these in terms of their impact on the financial industry. In doing so, the author hopes to instill a greater confidence in the reader, to dig deeper and learn more about those technologies that capture their imagination.

At first glance, the topics covered herein may seem disparate. The different technologies that are explored may seem unconnected. However, when viewed from a birds-eye view, the relationships become clearer. In this way, this book attempts to give the reader a ‘lay of the land’ in order to understand how different technologies are subject to the same underlying trends. For example, the ascent of artificial intelligence (AI) and cryptocurrencies would not have been possible without the processing power enabled by advancements in microchip technology; in other words, both innovations are part of the same story.

A core theme in this book is that the financial system and the internet are converging. Just as financial transactions contain information about people's preferences, so do clicks, reposts and instant messages. As both categories rely on the transmission of electrical signals, it is difficult to demarcate the two systems; indeed, with the increasing monetization of online user behaviour and the growing digitization of finance, perhaps they will soon be indistinguishable?

When exploring FinTech through the lens of systemic convergence, between the financial and digital spheres, it becomes clearer how the various topic areas of this book fit together. While greater connectivity and better user interface design enable greater data collection, technologies such as blockchain and AI enable the emergence of new, and better, ways of doing finance. The net result of this is that financial services become increasingly decentralized, automated and user centric.

However, it is hoped that the reader will see FinTech as more than making financial services faster, cheaper and more convenient by way of digitization. There is a paradox in using technology to reduce or remove humans from financial services, in that this actually increases the need for a human touch; in the absence of person-to-person interactions, the only thing distinguishing one financial institution from another will be corporate logotypes. In other words, a competitive advantage can be found in deploying a human touch in a FinTech context.

Thus, it is hoped that the reader will use this book to benefit professionally from the wave of technological disruption sweeping through the financial sector. Whilst some professionals are dabbling in coding and others are honing their 'soft' skills, there is an opportunity in being a conduit between the two camps; in other words, being the link between decision makers (clients, senior management, etc) and the 'techies'. This book is written with those professionals in mind and aims to give them the requisite knowledge to pull this off.

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WALKTHROUGH OF FEATURES AND ONLINE RESOURCES

Learning objectives

LEARNING OBJECTIVES

At the beginning of each chapter, a checklist of learning objectives outlines what you will learn from reading the chapter.

Case studies



CASE STUDY

A range of case studies about different products, services and organizations bring the theory to life and illustrate how key ideas operate in practice.

Discussion points and suggested answers



DISCUSSION POINT

An open question helps students probe further into the case study and stimulates discussion on topical issues.



SUGGESTED ANSWERS TO DISCUSSION POINTS

Suggested answers, included at the end of the each chapter, explore points you may have missed and encourage further reflection.

Key takeaways



KEY TAKEAWAYS

A clear summary of the most important lessons from each chapter, which allows you to reflect on what you have learnt.

Glossary

A collection of technical terms and their definitions which helps cut through jargon and demystify key technologies in a clear and accessible manner.

Online resources

Supporting online resources for students and lecturers include supplementary case studies, which will provide more extensive examples, and PowerPoint lecture slides for each chapter of the book. The online resources can be found at [to be inserted at a later date].