Taylor & Francis
Online

Journal of Management Information Systems ›
Volume 35, 2018 - Issue 1

31,362 Views | 1,715 CrossRef citations to date | 14 Altmetric

Original Articles

On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services

Peter Gomber, Robert J. Kauffman, Chris Parker & Bruce W. Weber

Pages 220-265 | Published online: 30 Mar 2018

Cite this article https://doi.org/10.1080/07421222.2018.1440766

Check for updates

Sample our Communication Studies Journals
>> Sign in here to start your access to the latest two volumes for 14 days

Full Article | Figures & data | References | Citations | Metrics
Reprints & Permissions | Read this article | Share

Abstract

The financial services industry has been experiencing the recent emergence of new technology innovations and process disruptions. The industry overall, and many fintech start-ups are looking for new pathways to successful business models, the creation of enhanced customer experience, and approaches that result in services transformation. Industry and academic observers believe this to be more of a revolution than a set of less influential changes, with financial services as a whole due for major improvements in efficiency, customer centricity, and informedness. The long-standing dominance of leading firms that are not able to figure out how to effectively hook up with the “Fintech Revolution” is at stake. We present a new fintech innovation mapping approach that enables the assessment of the extent to which there are changes and transformations in four areas of financial services. We discuss: operations management in financial

services and the changes occurring; technology innovations that have begun to leverage the execution and stakeholder value associated with payments, cryptocurrencies, blockchain, and cross-border payments; multiple innovations that have affected lending and deposit services, peer-to-peer (P2P) lending, and social media use; issues with respect to investments, financial markets, trading, risk management, robo-advisory and services influenced by blockchain and fintech innovations.

Key words and phrases:

business models | digital banking | financial services | Fintech Revolution | lending | markets | market operations | payments | process transformation | technology disruption | technology innovation

Acknowledgments

The authors would like to acknowledge the following people and organizations who have sponsored and supported research that some of us have done in this area for the past several years: Peter Ware and Nancy Murphy at the SWIFT Institute in London; Mats Wallén and Johan Weijne at Bankgirot, Sweden for research project-related discussions on the volume and content of a payment settlement intermediary's intraday retail payment transactions; colleagues at Citibank in Singapore, and the E-Finance Lab and the Research Center SAFE at Goethe University Frankfurt; and Steve Miller, Emmy Hoang, Zhiling Guo, Dan Ma, Mei Lin, Paul Griffin, and Dan Geng at Singapore Management University. We also wish to thank the authors of the "Fintech Revolution" Special Issue articles, for contributing to our research: Gordon Burtch, Jan Damsgaard, Daniel Gozman, Yi-Chun (Chad) Ho, Yili Hong, Yang Jiang, Erol Kazan, Jonathan Liebenau, Eric T.K. Lim, De Liu, Jonathan Mangan, Feng Mai, Carsten Sørensen, Chee-Wee Tan, Yong Tan, Jennifer J. Xu, Xiangbin Yan, Jonas Hedman, and the anonymous reviewers. All errors and omissions are the sole responsibility of the authors.

Notes

[1]. The IS literature offers many theory-based explanations of technology-driven transformations in the financial services industry. For studies on strategy and market transformation, the interested reader should see, among others: Clemons et al. [33] on the competitive disadvantage associated with market dominance; Han et al. [73] on IT ownership amid market transformation; Goh and Kauffman [65] on firm strategy and the Internet in commercial banking; and Clemons et al. [35] on the information-driven transformation of strategy and society, including financial services.

[2]. These developments are described in a National Public Radio show on the “Digital Industrial Revolution” [136].

[3]. Financial services operations, along with the business value and profitability that they can create, have been studied by researchers and practitioners since the 1980s [109, 132]. The respective themes include: the economics of electronic banking strategy and shared ATM networks [30, 87]; process variation as a basis for service quality and performance [59]; retail banking strategy when electronic distribution technology costs influence bank competition and performance [23]; the economic effects of technological progress on banking [15]; system design and process performance in trade finance operations [43]; customer intimacy strategies with IT for small bank-offered financial services [134]; nowcasting machine-based forecasts for GDP [60]; new management science approaches to credit card risk scoring [27]; and support vector machines [14] and other ML algorithms [94] for consumer credit scoring.

[4]. For an early review of models, see Capon [25].

[5]. There is an interesting similarity here to how the credit card lender, Capital One got its own start, with the slogan “Don’t call us, we’ll call you,” based on their effort to do data mining on potential customers to figure out what card-related interest rate would match the levels of risk of default on loans that were involved [36].

[6]. Research on issues associated with payments in the global economy have been covered by: Clemons et al. [34] on how Mondex reengineered money with nondebit, noncredit plastic cards in the 1990s; Au and Kauffman [8, 9] on how electronic billing infrastructures developed, and on the economics of mobile payments; Staykova and Damsgaard [131] and Kazan et al. [93] on market competition for mobile payments platform; and [76] and Liu et al. [105] on cooperation, competition, and regulation related to mobile payments market changes and ecosystem changes. There have been many others, though these are representative.

[7]. Some of the key issues here involve the cohesiveness and performance of the faster payment settlement system as a business network. In other theoretical analysis work, a variety of issues are highlighted that make procurement platforms, loyalty networks, and group-buying systems all have difficult issues in regard to network viability [35], including: the likelihood of long-term network sustainability; the extent of process standards that support a network; the extent of firm and customer informedness about network and system performance; demand-driven complementary network value; sustainable network value; performance monitoring and fair value sharing [88].

[8]. For several reviews of payment, clearing, and settlement systems around the world by the Committee on Payment and Settlement Systems (CPSS) economists of the Bank for International Settlements (BIS), the interested reader should see the series of white papers that the BIS published in the 2010s [40–42].

[9]. In an interview that the SWIFT Institute [133] conducted in 2015, NPP's chief executive officer Chris Hamilton pointed out the contrast between the low-value payment focus of NPP and its approach to managing liquidity, in comparison to the hybrid settlement system.

> Each participant would keep a pool of funds at the central bank segregated for the NPP. The liquidity inside each pool would be managed by a set of highly automated and effective tools that monitor the transactions of each participant in their respective pool and allow draw-down and top-up on parameters set by the participant. Each individual payment is settled through the pools in real time, creating an account-netting effect in each pool. The netting efficiency would essentially depend on the size of participants, relative to the nature of their transaction flows [133, p. 1].

[10]. For details on the technical underpinnings of blockchain technology, see Mueller-Eberstein [114].

[11]. Blockchain has also garnered the interest of central bankers. For example, He [75, p. 3] proposed the use of a central bank digital currency (CBDC), defined as

> a digital form of central bank money that can be exchanged in a decentralized manner. In other words, it can be transferred or exchanged peer-to-peer, directly from payer to payee without the need for an intermediary… . Such a CBDC would be exchanged at par with the central

bank's other liabilities (its cash and reserves)—either through banks or directly at the central bank.

The ramifications of such a choice on the part of central banks—to issue their own digital currencies—is fraught with technological and public policy issues that parallel those faced in other complex and sensitive domains, such as cybersecurity, the control of fake news, the patenting of digital innovations, and the control of sharing economy innovation [35].

[12]. These kinds of innovations reflect Chesbrough's [28] argument about breakthrough innovations for which the general problem is identified (digital cryptography, in this instance), but the domain will only become known over time as entrepreneurs develop new ideas for their application.

[13]. This is much like what the University of Pennsylvania Wharton School start-up, buySAFE, did. It originally teamed with eBay to diminish the all-in transaction costs between buyers and sellers, who had asymmetric information about the demeanor and performance reliability of their counterparties [32].

[14]. This parallels what was observed with airline price forecasting tools like FareCast (acquired by Microsoft in April 2008), and other oil and gasoline forecasting tools for energy producers and transportation fleet cost management.

[15]. Unlike several of the other fintech innovation areas that we have discussed, the applications in lending services have been very well-studied since the mid-2000s, especially P2P lending, and more recently, charitable crowdfunding and equity crowdfunding. Some of the most interesting works that have appeared in the literature to date make contributions related to fundamental and more advanced issues. For P2P lending, they include: the differences between alternate market mechanisms in P2P lending relative to repayment and other aspects of their performance [147]; how borrower participation in friendship networks may reveal their propensity for P2P loan repayment or default when there are lender-borrower information asymmetries [102]; how loan default can be mitigated with borrower information from social media in P2P lending [61]; how informal lender-borrower social communication influences default rates in P2P lending [151]; and finally, the extent to which platform choice, observed herding in decision making, and regulation influence P2P lending returns [84]. Some of the findings interested readers may wish to see in the current literature on crowdfunding include: the impacts of home bias effects, the tendency for transactions

to be made by counterparties from the same geographic area instead of outside it, in online campaigns [103]; the effects of provision point rule restrictions on the amount of funding an entrepreneur can draw from a fundraising campaign [22]; and the extent to which information hiding and participant contributions influence crowd campaign outcomes [21].

[16]. For studies on financial markets and firm strategies in the investment and trading industry, see: Clemons and Weber [37, 38] on competition between exchange and off-exchange venues for equity trading; Weber [146] on open-outcry and order-matching systems in futures markets; Levecq and Weber [101] on the strategic implications of financial market design choices; Han et al. [72] on JPMorgan's partial divestment of RiskMetrics for value-at-risk metrics infrastructure to Reuters [117]; Parker and Weber [11] on the effects of order-routing on new option market success; and Kauffman et al. [89] on technology ecosystem transformation in high-frequency trading systems.

[17]. This will likely be caused by their lack of technical expertise in some domains of emerging technologies, including ML and AI, natural language processing, blockchain app development, data science and IoT sensors, and the exploitation of open APIs. It is unlikely that the demand for the software development and hardware specialists, along with cybersecurity experts, will abate anytime soon. As a result, financial services firms in many countries around the world will be forced to outsource for application, product, and service development assistance.

[18]. Dietz et al. [50] have pointed to multiple kinds of changes that are likely to occur: expansion in the scope through the value chain of fintech innovation application; fintech start-up diversification in technology, segment, and geographic terms; partnerships and alliances to achieve new functionality and higher business value, as well as industry consolidation due to scale-focused acquisitions; a slowdown in value growth to more normal market valuations for fintech start-ups; regulators' involvement in the development of fintech clusters; and finally, the emergence of much larger fintech ecosystems that span industries and geography.

Additional information

Notes on contributors

Peter Gomber (gomber@wiwi.uni-frankfurt.de) holds the Chair of e-Finance, Department of Information Systems, Faculty of Economics and Business Administration, at Goethe University of Frankfurt, Germany. He acquired his Ph.D. from the Institute of Information Systems at the University of Giessen, Germany. He is co-chairman and member of the Board of the E-Finance Lab, an industry-academic partnership between Frankfurt and Darmstadt Universities, and leading industry partners that include Deutsche Börse, IBM, DZ Bank, Finanz Informatik, and FactSet. He is a member of the Exchange Council of the Frankfurt Stock Exchange, and the Consultative Working Group of the Secondary Market Standing Committee of the European Securities and Markets Authority. His academic work focuses on digital finance and fintech, information systems in financial markets, market microstructure theory, regulatory impact on financial markets, and innovation in electronic trading systems. He serves as editor in chief of EFL Quarterly and associate editor of several other journals. His research publications have appeared in Journal of Business Economics, Journal of Information Technology, Decision Support Systems, European Financial Management, and many other journals, research monographs, and conference proceedings.

Robert J. Kauffman

Robert J. Kauffman (rkauffman@smu.edu.sg) is a professor of information systems, School of Information Systems, Singapore Management University (SMU). He holds a Ph.D. from Carnegie Mellon University. He serves as associate dean (Faculty), and previously was associate dean (Research) at SMU. He was a Distinguished Visiting Fellow at the Center for Digital Strategies, Tuck School of Business at Dartmouth; the W.P. Carey Chair in Information Systems at Arizona State, and was professor and director of the MIS Research Center at the University of Minnesota, while chairing the Department of Information and Decision Science. His research focuses on technology and strategy, the economics of information technology, financial services and technology, managerial decision making, and e-commerce. His work has appeared in Information Systems Research, Journal of Management Information Systems, MIS Quarterly, Telecom Policy, Decision Sciences, Management Science, Review of Economics and Statistics, and many other journals. He is editor in chief of Electronic Commerce Research and Applications. He has served in senior leadership roles for conferences and has funded industry research projects, and has also served on research review panels in Canada, Singapore, the Netherlands, Finland, Hong Kong, and the United States.

Chris Parker

Chris Parker (chris.parker@psu.edu; corresponding author) is an assistant professor of supply chain management in the Department of Supply Chain and Information Systems in the Smeal College of Business of Pennsylvania State University. He also works with the Information Communication Technology for Development (ICT4D) Consortium, housed in the College of Communications. He earned his Ph.D. at the London Business School in the Management Science and Operations Department. His research addresses questions at the interface of operations management and information systems. His publications appear in Management Science, Journal of Management Information Systems, and Transportation Science.

Bruce W. Weber

Bruce W. Weber (bweber@udel.edu) is dean of the Lerner College of Business and Economics at the University of Delaware, where he is a professor of business administration and an affiliated faculty member of the Institute for Financial Services Analytics. He serves on the Advisory Council of the SWIFT Institute. He holds a Ph.D. in decision sciences from the Wharton School of the University of Pennsylvania. He was previously a professor of information management and Subject Area Chair for Management Science and Operations at London Business School, and on the faculty of the Stern School of Business at New York University, and Baruch College, City University of New York, where he was the founding director of the Subotnick Financial Services Center. His work evaluates the economic advantages of digital markets, and highlights the new challenges facing traders, managers, and regulators in an increasingly computerized financial services industry. His research on information technology strategy, financial sector computerization, and compliance systems has been published in leading academic journals and has been cited in the Wall Street Journal and the Financial Times. His books are The Equity Trader Course (Wiley, 2006) and Mastering Equity Trading through Simulation (Wiley, 2010).

Related research

People also read | Recommended articles | Cited by 1715

Using thematic analysis in psychology >

Virginia Braun et al.
Qualitative Research in Psychology
Published online: 21 Jul 2008

Fintech, financial inclusion and income inequality: a quantile regression approach >

Ayse Demir et al.
The European Journal of Finance
Published online: 1 Jun 2020

The Future of Fintech >

Anne-Laure Mention
Research-Technology Management
Published online: 26 Jun 2019

View more

Information for

Authors
R&D professionals
Editors
Librarians
Societies

Open access

Overview
Open journals
Open Select
Dove Medical Press
F1000Research

Opportunities

Reprints and e-prints
Advertising solutions
Accelerated publication
Corporate access solutions

Help and information

Help and contact
Newsroom
All journals
Books

Keep up to date

Register to receive personalised research and resources by email

Sign me up

Copyright © 2026 Informa UK Limited Privacy policy
Cookies Terms & conditions Accessibility

Taylor & Francis by informa

Registered in England & Wales No. 01072954
5 Howick Place | London | SW1P 1WG