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Journal of Management Information Systems > Volume 35, 2018 - <u>Issue 1</u>

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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

G Cite this article **Z** https://doi.org/10.1080/07421222.2018.1440766

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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 | on tech | nnology 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-



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 bankoffered 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].



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 [<u>40–42</u>].

⁹. In an interview that the SWIFT Institute [<u>133</u>] 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



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 [<u>28</u>] 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 [<u>32</u>].

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.

2000s, applicati X iitv especial crowdfu e literature to date es. For P2P lending, is in P2P lending : how r P2P loan borrowe ries [102]; repayme how edia in P2P lending s default observed rates in herding <u>4]</u>. Some of the findi crowdfu ansactions to be ma tside it, in online ca e amount of

¹⁵. Unlike several of the other fintech innovation areas that we have discussed, the

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 [<u>37</u>, <u>38</u>] on competition between exchange and off-exchange venues for equity trading; Weber [<u>146</u>] on open-outcry and order-matching systems in futures markets; Levecq and Weber [<u>101</u>] on the strategic implications of financial market design choices; Han et al. [<u>72</u>] on JPMorgan's partial divestment of RiskMetrics for value-at-risk metrics infrastructure to Reuters [<u>117</u>]; Parker and Weber [<u>11</u>] on the effects of order-routing on new option market success; and Kauffman et al. [<u>89</u>] 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.



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