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Rethinking Intellectual Property Risk in the Digital Banking Revolution

DANIELLE WILLIAMS & KERRIE EDMONDSON*

I. INTRODUCTION

For centuries, the United States banking industry has led in development and transformation through technology. From the introduction of wire transfers in the 1870s, to routing numbers (1910), investment funds (1920s), credit cards (1950s), credit scoring (1950s), ATMs (1960s), securitization (1970s), debit cards (1980s), telephone banking (1980s), online banking (1990s), structured products (1990s), and finally, derivatives (1990s), the banking industry has identified opportunities through technology.¹ Moreover, the industry has developed products, services, and infrastructure to advance its contribution to the world economy.² The Digital Banking Revolution³ is no different. Today, the banking industry offers products and services running on technology platforms that rival Silicon Valley's most innovative technology companies.⁴ Whether responding to customer demands for digital banking, making stock trading platforms faster and more efficient,

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1. Elizabeth Judd, *Timeline: 180 Years of Banking Technology*, INDEP. BANKER (Oct. 31, 2017), <https://independentbanker.org/2017/10/timeline-180-years-of-banking-technology/> [<https://perma.cc/C7J2-9ZYK>]; see also *The Evolution of Banking Technology*, US BANK (Jan. 30, 2019), <https://www.usbank.com/financialiq/manage-your-household/personal-finance/evolution-of-banking-technology.html> [<https://perma.cc/LG2V-L2HQ>].

2. See *The Evolution of Banking Technology*, *supra* note 1 (describing the evolution of banking-related technologies).

3. The Digital Banking Revolution is part of the Fourth Industrial Revolution. The first three Industrial Revolutions were defined by the major developments of each age: steam and water, power, electricity and assembly lines, and computerization. The Fourth Industrial Revolution is defined by the “the adoption of cyber-physical systems.” See Bernard Marr, *The 4th Industrial Revolution Is Here – Are You Ready?*, FORBES (Aug. 13, 2018, 12:26 AM), <https://www.forbes.com/sites/bernardmarr/2018/08/13/the-4th-industrial-revolution-is-here-are-you-ready/?sh=34c0adcb628b> [<https://perma.cc/VV3H-3VUW>].

4. Jake Levant, *Forget Fintech – Traditional Banks Have (Finally) Figured it Out*, FORBES (Aug. 23, 2021, 7:45 AM), <https://www.forbes.com/sites/forbestechcouncil/2021/08/23/forget-fintech---traditional-banks-have-finally-figured-it-out/?sh=46b52fc613ac> [<https://perma.cc/A2H3-JCEF>].

or streamlining backend infrastructure, banking has evolved into a technology-based industry.⁵ The banking industry recognized the need for technological innovation and assumed its rightful place in the Digital Age. However, one key facet of that evolution remains to be addressed: intellectual property—whether belonging to industry participants or others. To complete its transformation, the banking industry must also reshape its views of intellectual property’s place in the risk analysis equation. This article will explore the landscape of developing technologies, the intellectual property risks associated with those advances, and propose ways to manage those risks as the industry continues to adapt and solidify its leadership in the Digital Banking Revolution.

II. THE CURRENT LANDSCAPE OF DIGITAL BANKING

A. *Trends and Developments in Digital Banking*

The banking industry offers a wide array of digital banking products and services. Mobile payment apps offer the most visible example. Mobile payments are a form of contactless payment for shoppers who use their mobile devices for in-app payments (e.g., using a Starbucks or Chick-fil-A app), mobile point of sale (“MPOS”)⁶ payments (e.g., using Apple Pay, Google Pay, or Samsung Pay), online payment services (e.g., PayPal), or mobile peer-to-peer transfers (e.g., Venmo or Zelle). Each offers a different user experience.⁷ Mobile wallet apps

5. U.S. DEP’T OF THE TREASURY, A FINANCIAL SYSTEM THAT CREATES ECONOMIC OPPORTUNITIES, NONBANK FINANCIALS, FINTECH, AND INNOVATION 13 (2018), <https://home.treasury.gov/sites/default/files/2018-08/A-Financial-System-that-Creates-Economic-Opportunities---Nonbank-Financials-Fintech-and-Innovation.pdf> [<https://perma.cc/SE7S-H6VV>] (“From 2010 to the third quarter of 2017, more than 3,330 new technology-based firms serving the financial services industry have been founded, 40% of which are focused on banking and capital markets. In the aggregate, the financing of such firms has been growing rapidly, reaching \$22 billion globally in 2017, a thirteenfold increase since 2010. Significantly, lending by such firms now makes up more than 36% of all U.S. personal loans, up from less than 1% in 2010. Additionally, some digital financial services reach up to some 80 million members, while consumer data aggregators can serve more than 21 million customers.”).

6. Sara Coleman, *6 Fascinating Trends in Mobile Payments*, SPLITIT (Sept. 1, 2020), <https://www.splitit.com/blog/6-fascinating-trends-in-mobile-payments/> [<https://perma.cc/CL78-P28A>].

7. See Jonas P. DeMuro, *Best Mobile Payment Apps in 2022*, TECHRADAR (Feb. 1, 2022), <https://www.techradar.com/news/best-mobile-payment-app> [<https://perma.cc/JE9F-XQBv>] (comparing numerous mobile payment apps and highlighting the strengths and shortcomings of each); Michael Muchmore, *The Best Mobile Payment Apps*, PCMAG, <https://www.pcmag.com/picks/the-best-mobile-payment-apps> [<https://perma.cc/3D9H->

essentially take the place of a physical credit card in that the “wallet” resides on the mobile device rather than in a pocket or handbag. Mobile wallet apps allow users to store their debit or credit card digitally by linking their card to the app.⁸ A user can place their mobile device near a compatible device that will read the digitally stored credit or debit card and process a payment using near-field communication (commonly referred to as “NFC”).⁹ Merchants accept mobile payments with MPOS technology units, which replicate sales terminals or cash registers and can be used anywhere. Merchants can also accept mobile payments from mobile devices.¹⁰

The trend toward mobile payments began in 2011 with the introduction of the Google Wallet;¹¹ mobile payments gained further traction in 2014 with the introduction of Apple Pay and have since seen widespread adoption. From 2011 to 2019, usage steadily grew.¹² By 2017, 48.1 million individuals in the United States reportedly used mobile payments.¹³ In 2018, that number grew to 55 million and, by 2019, 61.6 million people reported using mobile payments.¹⁴ The COVID-19 pandemic has accelerated customer adoption and usage: 2020 saw 29% year-over-year growth of 92.3 million users, followed by 101.2 million

RVZV] (last updated Dec. 8, 2020) (comparing mobile payment apps like Venmo, Zelle, Google Pay, PayPal, and others).

8. See, e.g., *Mobile Wallet*, CORP. FIN. INST., <https://corporatefinanceinstitute.com/resources/knowledge/ecommerce-saas/mobile-wallet/> [<https://perma.cc/5YXQ-DGNU>] (last visited Feb. 5, 2022) (providing a high level overview of mobile wallets and how to use them).

9. See Coleman, *supra* note 6 (“The main technology behind the use of mobile wallets is called NFC, or near field communication. In simple terms, near field communication works by allowing two devices that are ‘near’ to one another . . . to exchange information and data. As long as the two devices are compatible, then NFC can work with your smartphone and a POS (point-of-sale) terminal.”).

10. *Id.*

11. While PayPal was introduced in 1998, and Google Wallet was introduced in 2011, many mark Apple Pay as the inception of modern mobile payment. Android and Samsung rolled out their mobile payment options a year after the introduction of Apple Pay. See *id.*; John Rampton, *The Evolution of the Mobile Payment*, TECHCRUNCH (June 17, 2016, 10:00 AM), <https://techcrunch.com/2016/06/17/the-evolution-of-the-mobile-payment/> [<https://perma.cc/2SRZ-W3RB>].

12. See Coleman, *supra* note 6 (noting that the mobile payment market reached over \$3 billion in 2019).

13. Rimma Katz, *The Mobile Payment Series: U.S.*, INSIDER INTEL. (Nov. 9, 2018), <https://www.emarketer.com/content/the-mobile-payments-series-the-us> [<https://perma.cc/MQ4Q-Q7ZH>].

14. *Id.*

users in 2021.¹⁵ By 2025, over half of all smartphone users are projected to be using mobile payments.¹⁶

Similarly, the banking industry relies on technology to run its many systems. For example, banking systems routinely use application programming interfaces (“APIs”) to offer new products and services, to integrate new technology with legacy systems, and to communicate specific customer information with third-party apps. An API is a “set of services that an operating system makes available to programs that run under it.”¹⁷ APIs act as the middleman between applications and web servers and provide additional security. In the payment processing context, a customer can enter their payment information into an application for an online transaction. With an API, the application does not need to access the customer’s bank account. Instead, the API creates a unique token for the transaction and includes that token in the API call to the web server.¹⁸ Through this method, the API provides an additional layer of security.

APIs are also essential to open banking, which is a “banking practice that affords third-party financial service providers free access to consumer banking, transaction, and other financial data from banks and non-bank financial institutions.”¹⁹ In part, open banking provides customers and merchants with a better banking experience by increasing security and efficiency in transactions. Open banking is supported by the use of APIs, as open banking allows banks to share financial data and services with third-party providers that use APIs.²⁰ In fact, “[i]n order to

15. *U.S. Payment Users Will Surpass 100 Million This Year*, INSIDER INTEL. (Mar. 30, 2021), <https://www.emarketer.com/content/us-payment-users-will-surpass-100-million-this-year?ecid=NL1016> [<https://perma.cc/E536-ACG6>].

16. *Id.*

17. DOUGLAS A. DOWNING ET AL., *DICTIONARY OF COMPUTER AND INTERNET TERMS* 22 (Barron’s Educational Series Inc., 11th ed. 2012); *see also Application Program Interface (API)*, IBM (Aug. 19, 2020), <https://www.ibm.com/cloud/learn/api> [<https://perma.cc/8UWW-RU7S>] [hereinafter *IBM Manual*] (describing APIs as a set of programming instructions that allows software applications to communicate with each other).

18. *IBM Manual*, *supra* note 17.

19. See Francois Botha, *Open APIs and What They Mean for Banks and Family Offices*, FORBES (May 18, 2021, 11:57 AM), <https://www.forbes.com/sites/francoisbotha/2021/05/18/open-apis-and-what-they-mean-for-banks--family-offices/?sh=6c98fce156d5> [<https://perma.cc/6MUY-J5CK>] (“At present [open banking and the use of APIs] is generally applied to payments and linked current accounts, and while it certainly has the potential to, it is yet to revolutionize the industry entirely. Nevertheless, forward-thinking banks who shift to adopt open banking practices on a broader scale and invest in the technology required to do so will find themselves in a position to strengthen customer relationships and retention.”).

20. See Doug Bonderud, *Why API-Powered Open Banking Is the Future of Finance*, BIZTECH (Jan. 13, 2022), <https://biztechmagazine.com/article/2022/01/why-api-powered-open-banking-future-finance-perfcon> [<https://perma.cc/M6W6-NM7Z>] (“Open banking is a

provide seamless data access, interoperability and security across multiple vendors and other financial institutions, multiple APIs are required, each with a specific purpose.”²¹ Open banking and APIs are increasingly popular in the banking world. In 2021, 25% of financial institutions indicated an intent to pursue new investments in APIs. In addition, “[a]bout half of credit unions have developed or invested in APIs prior to this year, and banks are finally catching up. Going into 2021, only 30% of banks had deployed APIs, but that’s up from the 21% that had done so going into 2020.”²²

Blockchain technology and quantum computing present other emerging trends to watch in digital banking. Generally speaking, blockchain is “an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way.”²³ Many banking industry leaders have recognized these benefits and have been on the forefront of blockchain technology adoption.²⁴ The growing recognition of blockchain’s benefits, including its security, means industry-wide adoption may only be a matter of time. Some use cases for blockchain technology in the banking industry are:

- Payments: Lacking a need for third-party authorization, blockchain technology can execute payment transactions faster. Further, remittance costs of 2%-3% versus 5%-

secure way for banks to share financial data and services with third-party providers such as mobile stock-trading applications or popular mobile payment service applications that use technologies like APIs It complements one of the core principles of banking—to protect customer information—by sharing the data in open and collaborative ecosystems, if customer consent is provided.”).

21. *Id.*

22. Ron Shevlin, *The 5 Hottest Technologies in Banking for 2021*, FORBES (Jan. 18, 2021, 5:00 AM), <https://www.forbes.com/sites/ronshevlin/2021/01/18/the-5-hottest-technologies-in-banking-for-2021/?sh=12ea66e735c4> [<https://perma.cc/GAQ4-QY55>].

23. *Blockchain*, MERRIAN-WEBSTER’S DICTIONARY, <https://www.merriam-webster.com/dictionary/blockchain> [<https://perma.cc/ZMY4-829E>] (last visited Feb. 5, 2022).

24. See, e.g., Leandra Monteiro, *HSBC Moves Corda Enterprise Blockchain Technology on To Google Cloud*, IBS INTELLIGENCE (Mar. 3, 2021), <https://ibsintelligence.com/ibsi-news/hsbc-moves-corda-enterprise-blockchain-technology-on-to-google-cloud/> [<https://perma.cc/E3CC-R8EP>] (explaining HSBC’s use of blockchain to support its global custody clients); Kate Rooney, *Goldman Sachs-backed Start-up Circle Including a Crypto Version of the U.S. Dollar*, CNBC (May 16, 2018, 7:75 AM), <https://www.cnbc.com/2018/05/15/goldman-sachs-backed-start-up-circle-introducing-a-crypto-us-dollar.html> [<https://perma.cc/6CMT-6L2Z>] (reporting Goldman Sachs’s investment in Circle’s USDC stable coin); Press Release, J.P. MORGAN CHASE & CO. (Apr. 14, 2021), <https://www.jpmorgan.com/news/jpmorgan-uses-blockchain-technology-to-help-improve-money-transfers> [<https://perma.cc/4RET-UQAZ>] (highlighting J.P. Morgan Chase’s use of blockchain technology for payments originating from Taiwan banks).

20% for traditional methods result in significant cost savings.²⁵

- Clearance and Settlement Systems: Blockchain could obviate the need for SWIFT, intermediaries, and a network of correspondent banks to settle transactions, allowing transactions to clear and settle in almost real time.²⁶
- Securities Trading: Blockchain could eliminate third parties, transaction validation, and associated fees.²⁷
- Know Your Customer (“KYC”) and Fraud Prevention: Banks could store KYC information on a blockchain, which would allow all divisions, and potentially other banks, to access the information. As a decentralized ledger, blockchain prevents hackers from accessing complete sets of customer information.²⁸

Quantum computing—simply put—is “a family of approaches for building computers that switch information with quantum interactions, rather than with the electronic interactions that power today’s computers.”²⁹ The banking industry is demonstrating interest in quantum computing for a variety of reasons, including “to process transactions, trades and other types of data as fast as possible.”³⁰ Notably, many industry analysts predict quantum computing will be the only option available in terms of energy usage in twenty years;³¹ quantum

25. *10 Use Cases of Blockchain Technology in Banking in 2022*, YOUTEAM, <https://youteam.io/blog/10-use-cases-of-blockchain-technology-in-banking/> [https://perma.cc/755X-GWLS] (last visited Feb. 5, 2022).

26. *How Blockchain Could Disrupt Banking*, CB INSIGHTS (Feb. 11, 2021), <https://www.cbinsights.com/research/blockchain-disrupting-banking/> [https://perma.cc/QT64-6TF5].

27. *Id.*

28. *Id.*

29. CHRIS HOOFNAGLE & SIMSON GARFINKEL, *LAW AND POLICY FOR THE QUANTUM AGE* 8 (2022), <https://www.cambridge.org/core/books/law-and-policy-for-the-quantum-age/026A5CE2FE7FE277B94DA01A519B2DAD> [https://perma.cc/J3BQ-NXUN]. See also U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-22-104422, *QUANTUM COMPUTING AND COMMUNICATIONS, STATUS AND PROSPECTS* (2019), <https://www.gao.gov/assets/720/717172.pdf> [https://perma.cc/P3RW-SK4L].

30. Penny Crosman, *Why Banks like Barclays Are Testing Quantum Computing*, AM. BANKER (July 16, 2018, 4:12 PM), <https://www.americanbanker.com/news/why-banks-like-barclays-are-testing-quantum-computing> [https://perma.cc/TA53-LJ83].

31. *Id.* See also Tim Wogan, *Quantum Computers Vastly Outperform Supercomputers When It Comes to Energy Efficiency*, PHYSICSWORLD (May 1, 2020), <https://physicsworld.com/a/quantum-computers-vastly-outperform-supercomputers-when-it-comes-to-energy-efficiency/> [https://perma.cc/6EK3-8NN4].

computers use significantly less energy than traditional computers.³² Due to its efficiency in analyzing large amounts of data, quantum computing is gaining popularity in the financial world.³³ Many industry leaders have entered into quantum computing research partnerships with IBM, including Goldman Sachs, Wells Fargo,³⁴ J.P. Morgan Chase,³⁵ and Barclays. In addition to these types of partnerships, Goldman Sachs and Citigroup have also invested in quantum start-ups.³⁶ McKinsey identified quantum computing's "most promising use cases" to be: faster identification of optimal risk-adjusted portfolios; more accurate estimates of credit exposure; more accurate market risk and scenario calculations for equity and FX trading; and more accurate decision-making for resource allocation in sales, marketing, and distribution.³⁷ Quantum computing has the potential to propel the banking industry into a more competitive space by "solv[ing] financial firms' need for increased computing capacity in the future, while requiring less energy than traditional computers" and by "minimiz[ing] risk and maximiz[ing] gains from dynamic portfolios of instruments."³⁸

32. Vern Brownell, *Quantum Computing Could Change the Way the World Uses Energy*, QUARTZ, <https://qz.com/1566061/quantum-computing-will-change-the-way-the-world-uses-energy/> [<https://perma.cc/3X5G-MKDH>] (last updated Apr. 26, 2021).

33. Quantum technologies offer even broader implications. See CHRIS HOOFNAGLE & SIMSON GARFINKEL, *LAW AND POLICY FOR THE QUANTUM AGE* 8 (2022), <https://www.cambridge.org/core/books/law-and-policy-for-the-quantum-age/026A5CE2FE7FE277B94DA01A519B2DAD> [<https://perma.cc/J3BQ-NXUN>] (expounding on the many implications of quantum technologies); *Defining Geopolitics in the Fourth Industrial Revolution* (Sept. 30, 2020), <http://content.winston.com/sitefiles/video/DefiningGeoPolitics.mp4> [<https://perma.cc/48HP-96AS>]. It should also be noted the Commerce Department and Treasury Department are paying close attention to China's development and use of quantum technologies and are imposing restrictions where appropriate. See Press Release, U.S. Department of Commerce, Commerce Lists Entities Involved in the Support of PRC Military Quantum Computing Applications, Pakistani Nuclear and Missile Proliferation, and Russia's Military (Nov. 24, 2021), <https://www.commerce.gov/news/press-releases/2021/11/commerce-lists-entities-involved-support-prc-military-quantum-computing>; <https://home.treasury.gov/news/press-releases/jy0538> [<https://perma.cc/UKF8-WBJQ>].

34. Sophia Chen, *Banks Are Betting That Quantum Computing Can Find Them an Investment Edge*, PROTOCOL (May 4, 2020), <https://www.protocol.com/manuals/quantum-computing/finance-banks-investing-investment-edge> [<https://perma.cc/3UNZ-X6RH>].

35. Crosman, *supra* note 30.

36. Chen, *supra* note 34.

37. Miklos Dietz et al., *How Quantum Computing Could Change Financial Services*, MCKINSEY & Co. (Dec. 18, 2020), <https://www.mckinsey.com/industries/financial-services/our-insights/how-quantum-computing-could-change-financial-services> [<https://perma.cc/HN33-KWU7>].

38. *Id.* See also John Comes & Carlos Oliver, *Quantum Computing: Why You Should Care*, KEARNEY, <https://www.kearney.com/communications-media-technology/article/?a/quantum-computing-why-you-should-care> [<https://perma.cc/U9UQ-SVPT>] (last visited Feb. 3, 2022) (explaining that, in part, quantum computing can help

B. *Pros and Cons of Digital Banking*

Digital banking provides a variety of benefits. For example, digital banking increases the speed and efficiency of transactions, which can improve the customer experience.³⁹ The banking industry has seen an overall increase in efficiency across products and services with digital banking because customers can execute transactions anywhere, at anytime. Customers can make payments with only a phone, manage their mortgages, and perform many other financial interactions, without ever entering a bank or speaking with a banker. These electronic transactions benefit the industry by allowing quicker transfer of information for settlement.⁴⁰ In addition, banks can collect and use customer data to customize and adapt products and services—as well as develop new products and services—for customers on a more efficient, personalized basis.

Notwithstanding the potential time savings digital banking offers, many consumers prefer the face-to-face interactions and services with bankers at a branch. Engaging with a banker in person may give customers confidence that their transactions are completed. A recent *Forbes* article suggests that some customers prefer banking at the branch to eliminate fraud risk.⁴¹ In some instances, customers preferred branch banking because they know they can complete the transactions there as compared to using digital platforms that may redirect them to a branch.⁴²

optimize which trades to settle first when facing a large number of trades because, unlike a traditional computer, “[a] quantum processor with millions of qubits could explore all possible combinations of order settlements in parallel to find the best answer”).

39. See, e.g., OECD, DIGITAL DISRUPTION IN BANKING AND ITS IMPACT ON COMPETITION 7 (2020), <https://www.oecd.org/daf/competition/digital-disruption-in-banking-and-its-impact-on-competition-2020.pdf> [<https://perma.cc/DL9C-NTBA>] (“[The] digital disruption offers the potential to improve efficiency with innovation, enhanced supply diversity, and a more competitive financial system that yields market extension augmenting financial inclusion”); see also Rebecca Ayer, *A Glimpse Inside Truist and Its Bank Tech Strategy*, FINLEDGER (May 5, 2021, 9:34 AM), <https://finledger.com/2021/05/05/a-glimpse-inside-truist-and-its-bank-tech-strategy/> [<https://perma.cc/V98W-46J2>] (providing an example of how improvements in digital banking enhance the customer experience).

40. BANK FOR INT’L SETTLEMENTS, FAST PAYMENTS – ENHANCING THE SPEED AND AVAILABILITY OF RETAIL PAYMENTS (Nov. 2016), <https://www.bis.org/cpmi/publ/d154.pdf> [<https://perma.cc/7ZEQ-3DZV>].

41. Jake Levant, *Grandma Wants Digital Banking Too—Don’t Ignore Her Needs*, FORBES (Sept. 17, 2020, 7:30 AM), <https://www.forbes.com/sites/forbestechcouncil/2020/09/17/grandma-wants-digital-banking-too---dont-ignore-her-needs/?sh=3b592f9255e0> [<https://perma.cc/MN27-CNLQ>].

42. See *id.* (explaining that to be competitive and effective in the digital world, banks must consider questions regarding the customer experience, including “[c]an customers complete processes digitally, uninterrupted, regardless of whether it’s opening up a credit card account or simply adding a loved one to their account?”).

III. LEGAL AND REGULATORY ISSUES PRESENTED BY TECHNOLOGICAL DEVELOPMENTS IN BANKING

Moving the banking experience onto a smartphone or computer presents security risks inherent in the nature of the operation.⁴³ Financial institutions may be keen to join the digital movement, but they must carefully consider the risks associated with this new frontier. These risks include an array of legal issues unique to digital banking, and some unique to financial services.

First, banks must consider the systemic cybersecurity risks associated with digital banking. Mobile banking allows users to transact entirely online—users can manage their bank accounts, transfer cash, invest, make payments, and so on—entirely from a smart phone.⁴⁴ But banking through a mobile device presents particular risks; mobile devices have relatively low security and are susceptible to hacking.⁴⁵ To reduce these risks, banks have added extra protection, like two-step authentication and biometric passwords.⁴⁶

Second, the banking industry benefits from its considerable experience as a highly regulated industry as it adopts new technologies.⁴⁷ Companies without such experience risk enforcement issues.⁴⁸ While the

43. See MOBILE BANKING: REWARDS AND RISKS, FED. DEPOSIT INS. CORP. 14–20 (2011), <https://www.fdic.gov/regulations/examinations/supervisory/insights/siwin11/siwin11-article2.pdf> [<https://perma.cc/A8XC-G3SR>] (identifying the risks of mobile banking to financial institutions and consumers).

44. TJ McCue, *Is Your Mobile Banking App Secure? Three Tips to Stay Safe*, FORBES (Aug 30, 2019, 6:19 PM), <https://www.forbes.com/sites/tjmccue/2019/08/30/is-your-mobile-banking-app-secure-three-tips-to-stay-safe/?sh=323a8dc16c2d> [<https://perma.cc/V9F2-VZYE>]; Dan Weil, *How Secure Is Mobile Banking*, WALL ST. J. (Mar. 18, 2018, 10:02 PM), <https://www.wsj.com/articles/how-secure-is-mobile-banking-1521424920> [<https://perma.cc/JT9G-7UWX>].

45. Jennifer Hill, *Mobile Phone Payments “Pose Huge Fraud Risk,”* REUTERS (May 19, 2008, 8:30 AM), <https://www.reuters.com/article/britain-contactless/mobile-phone-payments-pose-huge-fraud-risk-idUKNOA94822420080519> [<https://perma.cc/LQ7W-YYTA>].

46. *Id.*

47. See JOHANNES EHRENTAUD ET AL., REGULATING FINTECH FINANCING: DIGITAL BANKS AND FINTECH PLATFORMS 1–32 (Aug. 2020), <https://www.bis.org/fsi/publ/insights27.pdf> [<https://perma.cc/2BCR-NQ83>] (exploring how fintech financing is regulated).

48. See Jonathan Shieber, *SEC Slaps Startups Wealthfront and Hedgeable with Fines for Making False Disclosures*, TECHCRUNCH (Dec. 21, 2018, 3:25 PM), <https://techcrunch.com/2018/12/21/sec-slaps-startups-wealthfront-and-hedgeable-with-fines-for-making-false-disclosures/> [<https://perma.cc/UE8G-Y2GF>]; Shoshanna Solomon, *Payoneer to Pay US Treasury \$1.4 Million Fine Over Sanctions Violations*, TIMES OF ISRAEL (July 25, 2021, 1:39 PM), <https://www.timesofisrael.com/payoneer-to-pay-us-treasury-1-4-million-fine-over-sanctions-violations/> [<https://perma.cc/VP4K-9LMQ>]; Press Release, U.S. Sec. and Exch. Comm’n, Silicon Valley Company Settles Fraud Charge for Misstating

banking industry should be prepared to face new scrutiny from regulators as digital banking grows,⁴⁹ currently, most jurisdictions apply existing banking laws and regulations to banks regardless of the technology they use.⁵⁰ The current application of existing banking laws and regulations presents two takeaways. First, whatever laws and regulations allow fintech start-ups to enter the market also allow established banks to offer new digital banking products and services, and to run their businesses on new technology. Second, established banks are at an advantage considering their extensive experience with decades of regulation.⁵¹ This experience makes many established banks attractive partners for joint ventures and collaborations, and even technology transfer or acquisition. While fintech start-ups may have new technology, new research, and development opportunities, established banks have significant financial knowledge and regulatory experience.

Third, as new technologies are implemented and developed, the banking industry may face increased patent litigation with fewer defensive tools at all stages of litigation.⁵² According to Lex Machina, patent infringement lawsuits increased about 11% from 2019 to 2021.⁵³ In the last few years, the defensive tools available to the banking industry have eroded. For example, the Patent and Trademark Office (“PTO”) allowed the covered business method review program under the America Invents Act to expire on September 16, 2020, eliminating a tool to challenge patents directed to financial, nontechnological business methods on any ground, including patent eligibility, enablement, and

Returns to Investors (Apr. 19, 2019), <https://www.sec.gov/news/press-release/2019-58> [<https://perma.cc/3SVQ-W5W2>].

49. At least the Commodities Futures Trading Commission has expressed interest in additional data from banks regarding cryptocurrency transactions. As banks evolve, so must regulators. We expect regulators will similarly adapt to the intellectual property and digital realm and ask targeted questions related to transactions and digital processes. Regulators should consider whether they have the necessary skill sets and policies and procedures in place to regulate a new digital landscape.

50. Megmet Kerse & Ivo Jenik, *Some Countries Have Digital Bank Licenses, Others Have Digital Banks*, CGAP (Nov. 17, 2020), <https://www.cgap.org/blog/some-countries-have-digital-bank-licenses-others-have-digital-banks> [<https://perma.cc/YSF6-PDZB>].

51. Oliver Reppel, *Digital Regulators Are a New Norm in Financial Services*, ACCENTURE (June 18, 2020), <https://bankingblog.accenture.com/digital-regulators-are-a-new-norm-in-financial-services> [<https://perma.cc/3KPE-UDPZ>].

52. Patent assertion entities (“PAEs”) are expected to be the source of a significant portion of the patent litigation lawsuits against the banking industry. Among other strategies, the banking industry can take advantage of defensive patent aggregators like RPX, LOT, OIN, Allied Security Trust, and Unified Patents to mitigate litigation risk with PAEs. See Danielle Williams & Steven Gardner, *Basic Framework for Effective Responses to Patent Trolls* 17 N.C. BAR ASSOCIATION, IP LINKS 1, 1–4 (2006).

53. LEX MACHINA, <https://lexmachina.com/> [<https://perma.cc/ML3X-EM3A>] (last visited Feb. 5, 2022).

indefiniteness.⁵⁴ In addition, patent eligibility continues to be a steady source of controversy due to the inconsistent application of case law at both the district court and Federal Circuit levels. Furthermore, the Federal Circuit's decision in *Berkheimer v. HP Inc.* has limited the success of Rule 12 motions and summary judgment motions on patent eligibility grounds.⁵⁵ The success of motion practice on patent eligibility has always varied from jurisdiction to jurisdiction. However, *Alice's Step Two*⁵⁶ can present an obstacle even in the clearest case of patent ineligibility. On the damages front, patent litigation defendants saw their ability to challenge a patent owner's enforcement delays curtailed when the United States Supreme Court eliminated the laches defense to damages for patent infringement in *SCA Hygiene Products AB v. First Quality Baby Products LLC*.⁵⁷ Adding to the confusion, the 2019 Revised Patent Subject Matter Eligibility Guidance from the PTO⁵⁸ fails to incorporate or address the Federal Circuit's decisions designating additional categories of ineligible subject matter.⁵⁹

Finally, while intellectual property protection is not new to the banking industry, the rapid technological innovation characteristic of the Digital Banking Revolution presents the banking industry with an opportunity to rethink its positions on, and management of, intellectual property.

IV. MANAGING INTELLECTUAL PROPERTY RISK

In today's technology race, it is not enough to be first to the innovation finish line; companies must also solidify their win by

54. Matthew Bultman, *Banks Face Lawsuit 'Frenzy' After Business Patent Reviews End*, BLOOMBERG L. (Apr. 13, 2021, 6:01 AM), <https://news.bloomberglaw.com/ip-law/banks-face-lawsuit-frenzy-after-business-patent-reviews-end> [https://perma.cc/B9H2-22WR].

55. *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1363 (Fed. Cir. 2018).

56. *Alice Corp. v. CLS Bank International* is the most recent "seminal" case on patent eligibility. See *Alice Corp. v. CLS Bank International*, 573 U.S. 208 (2014).

57. *SCA Hygiene Products AB v. First Quality Baby Products LLC*, 137 S. Ct. 954, 959 (2017).

58. 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019), <https://www.govinfo.gov/content/pkg/FR-2019-01-07/pdf/2018-28282.pdf> [https://perma.cc/M8TB-YNM4].

59. Based on her hearing testimony and answers to Questions for the Record, President Biden's nominee for Under Secretary of Commerce for Intellectual Property and Director of the U.S. Patent and Trademark Office, Kathi Vidal, is poised to work with Congress to address the inconsistencies in the application of patent eligibility. See Senator Chuck Grassley, *Questions for the Record For Ms. Kathi Vidal, Nominee for U.S. Patent and Trademark Office Director*, 1, 32–33 (Dec. 1, 2021), <https://images.law.com/contrib/content/uploads/documents/403/57732/Vidal-answers-to-senators-questions-1.pdf> [https://perma.cc/B5NK-X59B].

protecting their intellectual property. The law offers many different ways for innovators to build and maintain protection for their intellectual property. Certainly, traditional technology companies have been protecting their innovations for decades in a variety of ways, including patents, copyright protection, and trade secrets. Rather than looking at traditional technology companies as too far ahead for the banking industry to catch, banks should instead look to these companies to determine what lessons can be learned.

Technology companies such as IBM, Samsung, Intel, Apple, Microsoft, Qualcomm, and Amazon routinely rank in the top fifty United States patent assignees.⁶⁰ Just as banks focused on joining the Digital Banking Revolution, nothing prevents the banking industry from entering the race to protect the innovations it has developed and, in doing so, join the ranks of traditional technology powerhouses. As the banking industry continues to solidify its leadership in digital banking through its own development, partnerships with other companies, and acquisitions of technology, banks can adopt proven strategies to protect their innovations. Many banks regularly seek patent protection for their intellectual property. However, a review of annual patent filings and grants reports reveals a clear opportunity for developing patent programs that aggressively seek to protect and reward technological innovations at every level of the organization.⁶¹

A. *Building a Culture of Innovation*

Many traditional technology companies began with an idea in a garage.⁶² From those modest beginnings, today's technology leaders

60. 2021 Top 50 US Patent Assignees, IFI CLAIMS PATENT SERVICES (Jan. 5, 2022), <https://www.ificlaims.com/rankings-top-50-2021.htm> [<https://perma.cc/QF6R-64CX>] (last visited Feb. 4, 2022).

61. As of 2020, only six banks had more than 1,000 assigned patents: Bank of America, Capital One, Citibank, ICBC (China), J.P. Morgan Chase, and Wells Fargo. *Analysis of Banking Patent Filing Strategy*, ARANCA (Aug. 2021), https://www.aranca.com/assets/uploads/resources/special-reports/Why_Banks_are_Filing_Patents-Aggressively.pdf [<https://perma.cc/NR2R-C29V>].

62. For example, this includes Google, Microsoft, Apple, and Epic Games. See Ross McGuinness, *On This Day: Inside the Garage Where Google Was Founded*, YAHOO! (Sept. 4, 2021), <https://au.news.yahoo.com/on-this-day-garage-google-founded-215446987-041309313.html#:~:text=That%20was%20the%20date%20that,complete%20with%20table%20tennis%20table> [<https://perma.cc/VB8Z-9PVJ>] (discussing Google); *How Amazon Grew From a Garage Bookstore To Trillion-Dollar Company Under Jeff Bezos*, BUS. TODAY (July 5, 2021, 11:17 AM), <https://www.businesstoday.in/latest/corporate/story/how-amazon-grew-from-a-garage-bookstore-to-trillion-dollar-company-under-jeff-bezos-300452-2021-07-05> [<https://perma.cc/3DB4-2LZY>] (discussing Amazon); Beth Burgess, *7 Startups That Started in a Garage*, PAKWIRED (Oct. 30, 2019), <https://pakwired.com/7-startups-that-started-in-garage/#:~:text=Software%20giant%20Microsoft%20was%20started,called%20%E2%80>

focused on and nurtured a pervasive culture of innovation. Building on the lessons learned by those technology companies, banks and the banking industry can replicate a successful culture of innovation and protection. The most basic of intellectual property programs require proper invention disclosure procedures and dynamic strategies for filing patent applications. However, building a culture of innovation should go beyond the basics, and banks can foster the proper culture in many ways.

Collaborations with other companies, whether in the banking industry or other technology areas, create both challenges and opportunities for innovation and protection.⁶³ Prior to any collaboration with another entity, a bank should investigate and catalog its own existing technology. By documenting its existing innovations and ideas, the bank can determine not only what types of protections to seek, but also protect itself in the event the collaboration turns from cooperative to litigious. Additionally, robust nondisclosure agreements can ensure that only truly serious collaborations result in third-party access to valuable intellectual property and protected information. Based on the Proposed Interagency Guidance on Third-Party Relationships: Risk Management, banks will also need to establish a comprehensive third-party risk management framework addressing the lifecycle of their relationships with suppliers (including cloud service providers), vendors (including data aggregators), fintech providers, and any other third parties with whom banks have a business relationship.⁶⁴ If adopted, the proposed Guidance would apply broadly to “any business arrangement between a banking organization

9CMicro%2DSoft%E2%80%9D [https://perma.cc/M5DE-RCH3] (discussing Microsoft and Apple); *Tim Sweeney: 11 Facts You Didn't Know About the CEO of Epic Games*, THE INDIAN EXPRESS (May 6, 2021, 4:22 PM), <https://indianexpress.com/article/technology/tech-news-technology/tim-sweeney-interesting-facts-you-didnt-know-about-the-ceo-of-epic-games-7304178/#:~:text=9.,valued%20at%20over%20%2429%20billion> [https://perma.cc/6KW7-VPA9] (discussing Epic Games).

63. The banking industry should consider participation in standards setting organizations (“SSOs”) addressing technology that may impact the industry specifically or generally. Some have expressed concern U.S. leaders are not participating in SSOs at the same level as Chinese leaders. See Robert D. Hormats, *Who Will Set Standards For 21st Century Technologies — The US Or China?*, THE HILL (June 3, 2021, 11:30 AM), <https://thehill.com/opinion/technology/556047-who-will-set-standards-for-21st-century-technologies-the-us-or-china> [https://perma.cc/68Y5-MCWC]. The U.S. Innovation and Competition Act, which the Senate passed in 2021, in part seeks to increase U.S. participation in SSOs. See United States Innovation and Competition Act of 2021, S. 1260, 117th Cong. § 2302 (2021), <https://www.congress.gov/bill/117th-congress/senate-bill/1260> [https://perma.cc/TX6N-YA8S].

64. Proposed Interagency Guidance on Third-Party Relationships: Risk Management, 86 Fed. Reg. 38182, 38190 (July 19, 2021), <https://www.federalregister.gov/documents/2021/07/19/2021-15308/proposed-interagency-guidance-on-third-party-relationships-risk-management#citation-9-p38186> [https://perma.cc/2BJ9-BWZZ].

and another entity, by contract or otherwise.”⁶⁵ The proposed Guidance stresses the importance of due diligence in selecting third-party relationships, negotiating appropriate contract terms, and planning for termination.

Even more important than the safeguards a bank utilizes when working with outside partners are the tools a bank uses to protect its innovations from both departing and incoming employees. A vigorous intellectual property program not only protects a bank from losing valuable property when employees join a new organization, but also protects the bank from competitor claims of misappropriation based on an incoming employee’s prior knowledge. The high mobility of employees in the technology sector creates a constant ebb and flow of employees to and from banks, technology companies, and financial services entities. For each research and development (“R&D”) manager a bank hires, another leaves for an up-and-coming technology company. For example, the former head of technology at ClearXchange came from Wells Fargo, where he served as vice president of R&D and Investments Technology.⁶⁶ Then there are banks that pursue other industry sectors for R&D talent: the current Chief Technology Officer of J.P. Morgan Chase worked for several information technology companies and holds multiple patents.⁶⁷ Other financial institutions pursue joint ventures in order to create digital banking technology.⁶⁸ Each of these scenarios presents its own risks and challenges to a bank’s intellectual property programs. In these situations, banks can learn from both the mistakes and successes of the technology industry’s past disputes in order to avoid unnecessary litigation. Some tools banks can use to mitigate the risks associated with employee mobility and joint venture projects include:

- comprehensive trade secret management programs to identify and protect trade secrets and proprietary information;

65. *Id.*

66. Sri Muthu, LINKEDIN, <https://www.linkedin.com/in/srimuthu/> [<https://perma.cc/USS2-A89T>] (last accessed Feb. 4, 2022).

67. Andrew Lank, LINKEDIN, <https://www.linkedin.com/in/andrew-lang-2457146/> [<https://perma.cc/729B-XXUT>] (last accessed Feb. 4, 2022).

68. Microsoft Corporation, *Morgan Stanley and Microsoft Collaborate to Accelerate Cloud Transformation*, PR NEWSWIRE (June 2, 2021, 9:00 AM), <https://www.prnewswire.com/news-releases/morgan-stanley-and-microsoft-collaborate-to-accelerate-cloud-transformation-301303869.html> [<https://perma.cc/7427-NCUF>]; *see also* Mark Matousek, *Goldman Sachs Is Creating an Auto-tech Joint Venture Amid a SPAC Boom for EV and Lidar Companies: Report*, BUS. INSIDER (Feb. 13, 2021, 1:21 PM), <https://www.businessinsider.com/goldman-sachs-creating-automotive-tech-joint-venture-2021-2> [<https://perma.cc/YPC8-LMY6>].

- nondisclosure agreements (“NDA”) and confidentiality agreements;
- proprietary information and invention assignment agreements;
- personal mobile device policies;
- social media policies;
- procedures for departing employees to address terminating access to information, returning employer property (e.g., devices and data), and otherwise ensuring the departing employee understands their confidentiality obligations on departure;
- procedures for onboarding new employees to secure representations that the employee is bringing no data from the former employer and returned all data, devices, and property to the former employer and otherwise understands what third-party intellectual property is and that the new employee is prohibited from using it; and
- protocols to evaluate when “decontamination periods” should be implemented for new employees, requiring them to work on projects unrelated to their prior work.

Patents and NDAs present banks with important tools for their intellectual property programs, but copyright law should not be overlooked.⁶⁹ Several aspects of copyright law have unique relevance to digital banking. Past innovations commonplace in digital banking today, such as QR codes, mobile banking, and contactless payments, can implicate both patent and copyright protection. The Copyright Office and the courts have long held that elements of computer programs, including source code and object code, enjoy copyright protection. Both the agency and the courts consistently reject arguments that code is merely functional and have set a low bar to surmount in order to establish sufficient creativity and originality to warrant protection—often requiring only “a modicum of originality.”⁷⁰ Copyrights offer a dependable tool to protect

69. In addition to the copyright law tools discussed herein, banks should consider investing in well-drafted Terms of Use on their websites and a robust Digital Millennium Copyright Act policy to avoid liability for the conduct of their customers—particularly for any online bank that permits users to post material on their website or store material within their system.

70. *See* *NEC Corp. v. Intel Corp.*, 1989 WL 67434 (N.D. Cal. 1989); *Oracle Am., Inc. v. Google Inc.*, 750 F.3d 1339, 1355 (Fed. Cir. 2014) (“Source and object code . . . are consistently held protected by a copyright on the program.”) (citing *Johnson Controls, Inc. v. Phoenix Control Sys., Inc.*, 886 F.2d 1173, 1175 (9th Cir.1989))) (“It is now well settled that the literal elements of computer programs, i.e., their source and object codes, are the subject

creative works. However, even though copyright attaches at the moment of creation, best practices require following the formalities of copyright registration if an owner needs to protect the work through litigation.⁷¹ Given the ease and low cost of copyright registration, a company is well-served by protecting works early, especially since the recovery of certain kinds of damages and attorneys' fees depends upon registration of the work prior to any infringement.⁷²

B. Trade Secret Issues: Case Studies

The case studies below involving traditional technology leaders provide lessons to the banking industry. Specifically, these case studies highlight the importance of robust procedures for departing employees to ensure that company trade secrets and proprietary information do not leave the company. Moreover, the cases described below demonstrate the importance of due diligence for acquisitions and joint venture partners.

*Waymo LLC v. Uber Technologies, Inc.*⁷³ illustrates the challenges former employees can present. Waymo LLC ("Waymo") owned patents related to self-driving vehicle technology and, in 2017, sued both Uber Technologies, Inc. ("Uber") and its subsidiary, Ottomotto, for patent infringement and trade secret misappropriation. Prior to founding Ottomotto, the company's creator, Anthony Levandowski, worked for Waymo and downloaded nine gigabytes of Waymo data, including trade secrets, before his departure. Waymo and Uber settled midway through the jury trial. As part of the deal, Waymo received a 0.34% stake in Uber, worth about \$245 million based on Uber's \$72 billion valuation at the time of settlement. The settlement included an agreement to ensure that Waymo's confidential information was not being incorporated into Uber technology, which Waymo said was its main goal in bringing the lawsuit.⁷⁴

This case highlights the liability risks that can attach to the departure or arrival of a single, high-value individual employee. If a bank hires a new employee from a technology firm to help with developing internal technology, the bank risks liability in the absence of the proper

of copyright protection.") (citing *Comput. Assocs. Int'l v. Altai*, 982 F.2d 693, 702 (2d Cir. 1992))).

71. *Fourth Est. Pub. Benefit Corp. v. Wall-Street.com, LLC*, 139 S. Ct. 881 (2019).

72. 17 U.S.C. § 412.

73. *Waymo LLC v. Uber Techs., Inc.*, 870 F.3d 1350 (Fed. Cir. 2017).

74. Alexandria Sage et al., *Waymo Accepts \$245 Million and Uber's 'Regret' to Settle Self-Driving Car Dispute*, REUTERS (Feb. 9, 2018, 11:04 AM), <https://www.reuters.com/article/us-alphabet-uber-trial/waymo-accepts-245-million-and-ubers-regret-to-settle-self-driving-car-dispute-idUSKBN1FT2BA> [https://perma.cc/UG52-G5RM].

policies and procedures to protect against disclosure of the former employer's confidential information. Because the employee may have exposure or experience with a prior employer's trade secrets, new innovations or technology developed by the employee could be subject to claims of misappropriation or infringement in a lawsuit against the hiring bank.

To avoid risk from an individual, banks should have protective mechanisms in place as they hire and recruit new employees. First, banks should consider comprehensive interviews and investigations to understand what work any potential hire was exposed to or engaged in before hiring the recruit. As explained below, thorough due diligence can save a company from liability. If a bank hires an experienced developer for R&D, the bank could, in theory, be liable for the employee's use of proprietary knowledge gained from the former employer in any R&D efforts on behalf of the new bank employer.

ZeniMax Media Inc. v. Oculus VR LLC presents another fact-intensive cautionary tale for joint venture participants, acquiring companies, and employers. In 2014, Facebook, Inc. ("Facebook") acquired Oculus VR LLC ("Oculus"), a virtual reality headset start-up, for \$2 billion.⁷⁵ Two years earlier, another company in the virtual reality technology sector, ZeniMax Media Inc. ("ZeniMax"), began development of its virtual reality ("VR") technology. During the development phase, its Chief Technology Officer, John Carmack, contacted Palmer Luckey and obtained his VR prototype, the "Rift."⁷⁶

In order to protect its then existing intellectual property, ZeniMax required Luckey to sign an NDA and a non-ownership agreement as to Carmack's contributions to the product. The 2012 NDA "placed Luckey under a broad duty to keep ZeniMax's proprietary information strictly confidential" and "provided that ZeniMax retained exclusive ownership of any proprietary information it disclosed under the NDA."⁷⁷ The result of Carmack and Luckey's collaboration was a "heavily modified Rift headset" that led Luckey to found Oculus LLC (the corporate predecessor to Oculus VR, LLC) in June 2012. Shortly after Oculus's formation, ZeniMax set up a file transfer protocol arrangement to share proprietary information on an ongoing basis.⁷⁸ In the fall of 2012, ZeniMax made "multiple requests" to Oculus to discuss "compensation for ZeniMax's role in developing and promoting the Rift."⁷⁹ On September 21, 2012,

75. *Id.*

76. *ZeniMax Media, Inc. v. Oculus VR, LLC*, 166 F. Supp. 3d 697, 700 (N.D. Tex. 2015).

77. *Id.*

78. *Id.*

79. *Id.* at 700.

Oculus forwarded ZeniMax a proposal “designed to kick off a formal discussion” of the parties’ future relationship. The parties never came to an agreement, and ZeniMax eventually stopped sharing information with Oculus.

With Carmack’s help, Luckey and Carmack advanced Rift from prototype to viable product by 2013. Once Carmack’s employment contract with ZeniMax expired in June 2013, Carmack joined Oculus as Chief Technology Officer. In 2014, Facebook acquired Oculus.⁸⁰ Unable to resolve its concerns about the misuse of its confidential and proprietary information with either Facebook or Oculus, ZeniMax brought suit against Facebook and Oculus alleging trade secret misappropriation, copyright infringement, and a variety of contract-based claims.⁸¹

In the lawsuit, ZeniMax alleged that it had “invested tens of millions of dollars in research and development” into its VR and that “Oculus and Luckey lacked the necessary expertise and technical know-how to create a viable virtual reality headset.”⁸² Thus, Oculus “sought expertise and know-how from ZeniMax.”⁸³ ZeniMax further alleged that “Carmack and other ZeniMax employees conducted [] research at ZeniMax offices, on ZeniMax computers, and by using ZeniMax resources.” In 2016, after a trial in which Mark Zuckerberg testified that Oculus’ Rift product did not use ZeniMax’s confidential source code and accused ZeniMax of crass opportunism in the face of the \$2 billion acquisition, the jury awarded ZeniMax \$500 million in damages for copyright infringement and breach of the NDA.

Ultimately, Facebook’s own actions left it with a choice between bad and worse arguments to present to a jury: either it did little to no due diligence when acquiring Oculus, or it did conduct due diligence and intentionally stole ZeniMax’s intellectual property. While ZeniMax protected its assets with an NDA between the parties, one is left to wonder why it allowed its Chief Technology Officer to collaborate with another company to develop valuable breakthrough technology without additional agreements beyond a bare NDA. Additional agreements should have been in place to clarify intellectual property rights between the parties, such as a joint development agreement, assignment

80. *Id.* at 702.

81. Complaint at 45, *ZeniMax Media, Inc. v. Oculus VR, LLC*, 166 F. Supp. 3d 697, 700 (N.D. Tex. 2015).

82. Ben Gilbert, *Oculus VR and Palmer Luckey Being Sued by CTO's Former Employer*, ENGADGET (May 21, 2014), <https://www.engadget.com/2014-05-21-oculus-vr-lawsuit.html#:~:text=Following%20E3%202012%20where%20the,sought%20expertise%20and%20know%2Dhow> [https://perma.cc/97GH-LHZS].

83. *Id.*

agreement, license agreement, or other agreement to define ownership and rights.

ZeniMax offers three clear lessons for banks as they develop new technology and pursue new talent in the marketplace: (1) when acquiring a new employee or company, do thorough due diligence and document those efforts adequately; (2) when developing new technology, protect any existing intellectual property through patent protection, copyright protection, trade secret management programs, and NDAs; and (3) when collaborating with another entity, solidify a joint collaboration and joint intellectual property ownership agreements *before* product development begins.

Given the lessons to banks detailed above, it is instructive to consider what a thorough due diligence effort looks like when a bank seeks to acquire a start-up company for future R&D work. At a minimum, it includes (1) an evaluation of the target company's issued and pending patent portfolios; (2) interviews with mission-critical employees to determine past employment, ongoing customer relationships, and the employees' product development efforts; and (3) an evaluation of the target's ongoing technology development efforts and any third-party involvement. Without these types of due diligence investigations, the acquiring bank may be entering a minefield of potential litigation that could derail its R&D efforts for years.

When a bank is developing rather than acquiring technology, well-crafted agreements that protect the bank's investment and resulting intellectual property should be in place prior to any meaningful exchange of information and talent with a joint venture partner. Any outside entity the bank collaborates with presents a risk of improper use of the bank's technology. Trying to prove which member of the joint venture developed what technology after the fact is a losing proposition. Rather than pursue difficult and costly litigation, a bank should protect itself and its valuable intellectual property with clear agreements beforehand.

Similar concerns create a need for agreements in the departing employee context. Every R&D employee who departs a bank for another company or competitor bank presents a risk to the bank's intellectual property. These risks can be mitigated with NDAs and non-compete agreements. Risk can also be managed thorough exit interviews that address the proprietary information the employee had access to and discuss the types of projects and technology that the employee expects to be involved with at the new employer. Existing agreements coupled with detailed exit interviews may provide a basis for the bank to prevent a departing employee from working on similar technology efforts at the new employer.

V. CONCLUSION

The banking industry may face novel issues in innovating and developing technology to meet the needs of the Digital Banking Revolution. In addressing these issues, banks have a unique opportunity to study the long history of traditional technology companies and their successes and failures balancing rapid technological development with vigorous intellectual property protection. Taking advantage of those lessons today will reap innumerable benefits as the future of digital banking continues to change and evolve.