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# Banking 5.0

## How Fintech Will Change Traditional Banks in the 'New Normal' Post Pandemic

Bernardo Nicoletti

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# Foreword

I have known Bernardo for quite a long time now—we have worked together in many countries, across many professional roles. Some years ago, he wrote another inspiring book, *The Future of Fintech*. I consider this book to be an outstanding sequel. Bernardo now tackles a new, yet connected, topic—how to push and support digital transformation in banking.

It was about time for such a book. The beginning of the so-called "Fourth Industrial Revolution" goes back to 2012. In 2021, however, many financial institutions continue to operate almost unchanged and seemingly unaware of what is happening around them. A few of them launched new companies and business models. Others failed, sometimes dramatically. The digital world has disrupted entire sectors, such as publishing, media recording, commerce, and manufacturing, among others. The financial services sector is not being spared.

"Digital transformation" has been on the agenda of many executives and board rooms for quite a long time. But beyond the buzzword, it is often not clear what "digital transformation" means. Financial services have often interpreted "digital transformation" only as a means to provide access to some products via digital channels, online or mobile, or, alternatively, as a pure cost reduction initiative. Digital transformation is much more than that: it is an entire change in the company's business model. It involves putting the customer at the center and using digital platforms to build a new business and operating model around that, using both

own or external products and services. Such a transformation involves all dimensions such as products, processes, people, partners, and platforms.

In the last few years, we have heard statements such as: "banking is necessary, but banks are not." This approach has spurred a number of studies to understand what digital transformation means for banks. Surprisingly, some financial institutions have yet to embrace the change.

Bernardo advocates putting the customer and their needs at the center and building on that using three steps: intuition, demonstration, and experiment. He also introduces certain exciting ideas about how "banking" should change, emphasizing the evolution from offering "products" to "services," and the fundamental importance of "platforms." The text is also full of insightful cases in which digital transformation has been experimented with and implemented.

The book also stresses another critical aspect: the increasing importance for financial institutions of data and data management. The crisis caused by the pandemic has underscored this point by not only giving it a new sense of urgency, but also by showing that banking can operate in a much more digital and agile way than we thought.

To date, bankers must use all available tools to grow, protect themselves, and better plan for the future. The most effective way to do this is through the strategic use of data, artificial intelligence, and robotic process applications in symbiosis with our talents. These solutions are essential in order to understand the customer and protect the institutions from exposure, as well as mitigate the associated risks. Unfortunately, in some cases, the probability of fraudulent transactions, dictated by despair, increases as well.

At the same time, bankers must do responsible banking, taking into account the ESG—Environment, Society, and Governance.

Analysis tools will play an essential role in this recovery, providing bankers with all the information they need to limit their exposure, promote new offers, and enrich their services.

It is fascinating to go through the various chapters of this book because the financial institutions that have started implementing the digital transformation state that their work is only the beginning of what is to come. There is a need for a continuous digital transformation.

A financial institution's question is not "if" to do it, it is "when" to do it. The time is now, and the success will be with the hard work pioneers.

Madrid, Spain
March 2021

Ramon Billordo
Senior Global Banking Executive, Financial Services, Digital Transformation, Global Fintech

# Contents

# Acronyms, Abbreviations, and Currencies

| | |
|---|---|
| 3P | Planet, Persons, Profit |
| ABA | American Banking Association |
| ADA | American with Disabilities Act |
| ADAS | Advanced Driver Assistance Systems |
| AGI | Artificial General Intelligence |
| AI | Artificial Intelligence |
| AIFM | Alternative Investment Fund Managers |
| AMA | American Marketing Association and American Management Association |
| AML | Anti-Money Laundering |
| ANN | Artificial Neural Network |
| API | Application Programming Interface |
| AR | Augmented Reality |
| ATI | Attitude Toward Innovation |
| ATM | Automatic Teller Machine |
| AUM | Assets Under Management |
| AVR | Automatic Voice Recorder |
| B2B | Business-to-Business |
| B2C | Business-to-Customer |
| BaaP | Banking as a Platform |
| BaaS | Bank as a Service |
| BC | Behavioral Control, Before Christ, or Business Continuity |
| BCP | Business Continuity Plan |
| BI | Business Intelligence or Business Interruption |
| BPaaS | Business Process as a Service |
| BPI | Business Process Intelligence |

| | |
|---|---|
| BPM | Business Process Modeling |
| BPO | Business Process Outsourcing or Business Process Optimization |
| CAGR | Compounded Annual Growth Rate |
| CBDC | Central Bank Digital Currency |
| CBR | Case-Based Reasoning |
| CC | Cognitive Computing |
| CCPA | California Customer Privacy Act |
| CDO | Chief Digital Officer |
| CEO | Chief Executive Officer |
| CERT | Computer Emergency Response Team |
| CES | Customer Engagement Score |
| CEV | Customer Engagement Value |
| CIC | Contract Inconsistency Checking |
| CIO | Chief Information Officer |
| CLM | Contract Lifecycle Management |
| CNN | Convolutional Neural Network |
| CNY | Chinese Yuan Renminbi |
| Cobot | Collaborative Robot |
| CPC | Customer Proximity Center |
| CPS | Cyber-Physical System |
| CR.AA.M | Compliance Risk & Audit Activity Management |
| CRM | Customer Relationship Management |
| CSAT | Customer Satisfaction Score |
| CSF | Critical Success Factor |
| CSR | Corporate Social Responsibility or Customer Service Representative |
| CTO | Chief Solutions Officer |
| CtQ | Critical to Quality |
| CTR | Click-Through Rate |
| CX | Customer Experience |
| DB | Data Base |
| DFS | Digital Finance Services |
| DM | Data Management |
| DNN | Deep Neural Network |
| DPI | Digital Performance Index |
| DR | Disaster Recovery |
| DRP | Disaster Recovery Plan |
| DRS | Disaster Recovery Site |
| DT | Design Thinking |
| EC | European Commission |
| ECB | European Central Bank |
| EDI | Electronic Data Interchange |
| EESC | European Economic and Social Committee |

| | |
|---|---|
| EP | Equator Principle |
| EPC | European Payments Council |
| ERP | Enterprise Resource Planning |
| ERPB | Euro Retail Payments Board |
| ESG | Environmental, Social, and Governance |
| ETF | Exchange-Traded Fund |
| EU | European Union |
| EUR | Euro |
| FC | Financial Crime |
| FCR | First Call Resolution |
| FDS | Fraud Detection System |
| FICO | Originally Fair, Isaac and Company |
| Fintech | Financial Solutions |
| FSB | Financial Stability Board |
| FTE | Full-Time Equivalent |
| G20 | Group of Twenty |
| GAFAM | Google, Amazon, Facebook, Apple, and Microsoft |
| GBP | British Pound Sterling |
| GDP | Gross Domestic Product |
| GDPR | General Data Protection Regulation |
| GPT-3 | Generative Pre-Trained Transformer |
| GPU | Graphics Processing Unit |
| GUI | Graphical User Interface |
| HCI | Human Computer Interaction |
| HFT | High Frequency Trading |
| HITL | Human-in-the-Loop |
| HNW | High Net Worth |
| HPC | High Performance Computing |
| HR | Human Resources (Department) |
| HRM | Human Resource Management |
| IA | Integrated Analytics or Intelligent Automation |
| IaaS | Infrastructure as a Service |
| IAM | Identity and Access Management and Innovation Acceptance Model |
| ICT | Information and Telecommunication Solutions |
| IDS | Intrusion Detection System |
| IEC | International Electrotechnical Commission |
| IEEE | Institute for Electrical and Electronics Engineers |
| IoC | Indicator of Compromise |
| IoT | Internet of Things |
| IP | Internet Protocol or Intellectual Property |
| IPS | Intrusion Prevention System |
| ISO | International Standard Organization |

| | |
|---|---|
| IVR | Interactive Voice Response |
| JPEG | Joint Photographic Experts Group |
| KPI | Key Performance (or Process) Indicators |
| KYC | Know Your Customer |
| LOC | Loan on blockchain Contract or Line of Credit or Line of Code |
| M&A | Merger and Acquisitions |
| MCD | Mortgage Credit Directive |
| MFA | Multi Factor Authentication |
| MICR | Magnetic-Ink Character Recognition |
| MIFID | Markets in Financial Instruments Directive |
| MIS | Management Information Systems |
| MIT | Massachusetts Institute of Solutions |
| MNO | Mobile Network Operator. And Maintenance and Operations |
| MP3 | Moving Picture 3 |
| MPC | Secure multi-party computation |
| MSMEs | Micro, Small, and Medium Enterprises |
| MSP | Multi-Sided Platform |
| NBO | Next Best Offer |
| NFC | Near Field Communication |
| NGFW | Next-generation Firewall |
| NGW | Next Generation Web |
| NIST | National Institute of Standards and Solution |
| NLG | Natural Language Generation |
| NLL | Natural Language Understanding |
| NLP | Natural Language Processing |
| NPS | Net Promoter Score |
| ODA | Operational Data Analytics |
| OECD | Organization for Economic Co-operation and Development |
| OT | Operations Solution |
| P&C | Property and Casualty |
| PaaS | Platform as a Service |
| PEF | Perceived Economic Factor |
| PROU | Perceived Ease of Use |
| PSP | Payment Service Provider |
| PSU | Payment Service User |
| PT | Perceived Trust |
| PU | Perceived Usefulness |
| R&D | Research and Development |
| RATER | Reliability, Assurance, Tangibles, Empathy, and Responsiveness |
| RBI | Reserve Bank of India |
| RE | Real Estate or Reputation |
| Regtech | Regulatory Solutions Organization |
| RFM | Recency, Frequency, and Monetary Value |

| | |
|---|---|
| RMB | Yuan renminbi |
| ROI | Return on Investment |
| ROPO | Research Online, Purchase Offline |
| RPA | Robotic Process Automation |
| RRSP | Registered Retirement Savings Plan |
| SCT | SEPA Credit Transfer |
| SCT inst | SEPA Instant Credit Transfer |
| SDG | United Nations Sustainable Development Goals. |
| SEC | Securities and Exchange Commission |
| SEPA | Single European Payment Area |
| SIEM | Security Information and Event Management |
| SLA | Service Level Agreement |
| SME | Small and Medium Enterprises |
| SMS | Short Message Service |
| SOC | Security Operations Center |
| SP | Social Pressures |
| STEM | Science, Solution, Engineering, Mathematics |
| STP | Straight Through Processing |
| Swift | Society for Worldwide Interbank Financial Telecommunication |
| SWOT | Strengths-Weaknesses-Opportunities-Threats |
| TAM | Solution Acceptance Model |
| TCM | Total Cost Management |
| TEG | Technical Expert Group |
| TIPS | TARGET Instant Payment Settlement |
| TQM | Total Quality Management |
| UCITS | Undertakings for Collective Investment in Transferable Securities |
| UD | Universal Design |
| UGAI | Universal Guidelines on Artificial Intelligence |
| UI | User Interface |
| UK | The United Kingdom |
| UMTS | Universal Mobile Telecommunications System |
| UN | United Nations |
| UNEP-FI | United Nations Environment Programme—Finance Initiative |
| UNICEF | United Nations Children's Emergency Fund |
| UPS | Uninterruptible Power Supply |
| US or USA | United States of America |
| USD | United States Dollar |
| UX | User Experience |
| VoC | Voice of the Customer |
| VR | Virtual Reality |
| VUCA | Volatile, Unpredictable, Complex, and Ambiguous |

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CHAPTER 1

# Introduction

*Banking is necessary; banks are not.*
Bill Gates

The global recession and the pandemic hit hard. They have affected all organizations and functions. After these crises, it is vital to develop and manage innovative strategies in banking. Except for fintech organizations, banking has almost remained outside of the trend of digital transformations.[1] Some financial institutions have begun to innovate, create new business models, invest in emerging technologies, and partner with fintech organizations, either financing or buying them.[2] Accenture, in a survey, found that only 1 in 10 banks were committed to digital transformation; 4 in 10 were trying to transform but had no integrated strategy, and 5 out of 10 were not making any progress.[3] Meanwhile, an IDC analysis estimates that 70% of all digital transformation initiatives do

[1] Uusitalo, J. (2019). *Strategic insurance in the face of uncertainty* (Master's Thesis). University of Jyväskylä, Finland.

[2] Generali. (2018, February). *Le assicurazioni tutto connesso*. www.generali.com/it/info/discovering-generali/all/2018/A-fully-connected-insurance. Accessed 2 November 2019.

[3] https://newsroom.accenture.com/news/only-half-of-banks-globally-are-making-significant-advancements-in-digital-transformation-resulting-in-lower-market-valuations-accenture-report-finds.htm. Accessed 3 March 2021.



B. Nicoletti, *Banking 5.0*, Palgrave Studies in Financial Services Technology, https://doi.org/10.1007/978-3-030-75871-4_1

not reach their goals.[4] Of the USD 1.3 trillion spent on digital transformation in 2018, it was estimated that more than $900 billion went to waste. If this is the scenario, financial institutions need to design and offer customers products and services relevant to them. At the same time, they did not base most of their innovations on customer centrality. This book has the objective to present this approach and calls it banking 5.0.

Bill Gates was clear: "Banking is necessary, banks are not."[5] This statement forecasts potential scenarios. These innovative approaches or visions are banking 5.0. This book underlines that the functions, disciplines, and activities of banking 5.0 can change financial institutions to support organizational efficiency, effectiveness, ethics, and economics within a long-term and sustainable perspective.

The sequence of industrial revolutions is:

- The steam engine characterized the first industrial revolution. The engine initially revolutionized the textile industry and then other sectors.
- The introduction of electricity brought about the second industrial revolution. It, combined with the introduction of mass production, created another change that spread from industry to social and political environments.
- The computer characterized the third industrial revolution, which again revolutionized work and extended into the social world.
- The mass diffusion of the internet characterized the fourth industrial revolution. It allowed the introduction of devices such as mobile phones with enormous impacts not only in the industry but in the social and political spheres.

At this point, one might wonder what the probable fifth industrial revolution will be. The answer is not easy and might tempt to say: let complete and use the full potential of Industry 4.0 and then think about the future. What the sequence of industrial revolutions proves is that their life cycle

[4] https://thefinanser.com/2020/10/the-difference-between-cloud-based-and-cloud-native.html/. Accessed 3 March 2021.

[5] Amberber, E. (2015). Banking is necessary, banks are not. *7 Quotes from Bill Gates on Mobile Banking*.

is getting shorter. It is therefore likely that the fifth industrial revolution is upon us.

The fifth industrial revolution can be expected to be characterized by the spread of solutions such as Artificial intelligence (AI), robots, and actions on sustainability. A broad fifth industrial revolution, based on technologies, such as robots, attention to sustainability, mobile phones, AI/cognitive computing, and predictive modeling, would affect the entire banking business model. These innovative solutions enable new ways of communicating, information sharing, and banking. There is a need for a new vision of banking. This vision is called banking 5.0 in this book. Innovative solutions have generated researchers' interest in very different fields: computer and management science, organization theory, law, and economics. An integrated vision is missing. This book shows why and how banking 5.0 can change in an integrated way banking. Banking 5.0 is potentially the engine and starting point of the customers' increasing need for innovative banking services and solution models.

This book analyzes the significance, development, and application of banking 5.0, to banking's digital transformation. The word digital in digital transformation might be misleading. A digital transformation is a definition and implementation of a new business model. In implementing this new business model, a digital solution will be relevant but not exclusive. This innovative approach should be transparent (almost invisible). As in the famous Turing test,[6] the customer should not understand if a person, a robot, or a mix of the two supplies banking.

There are important messages in this book. The first one is that banking is not necessarily done in banks. Banking should become part of the business activities and functions of all organizations and individuals. Ordinary activities should incorporate banking, whenever and wherever necessary. Non-financial transactions should embed banking transactions transparently to the customer. This situation does not mean that all the business or individuals should become banks. It means that the banking transaction should be part of their ordinary activities. The provision and processing of this transaction should be made usually by an external entity that, if necessary to the transaction, would have a banking license to assure the customer of the reliability and trust in the transaction. In other words,

[6]The Turing test was born as a criterium to determine if a machine is can behave as a person. Alan Turing suggested this criterium in the article Turing, I. B. A. (1950). Computing machinery and intelligence-AM Turing. *Mind, 59*(236), 433.

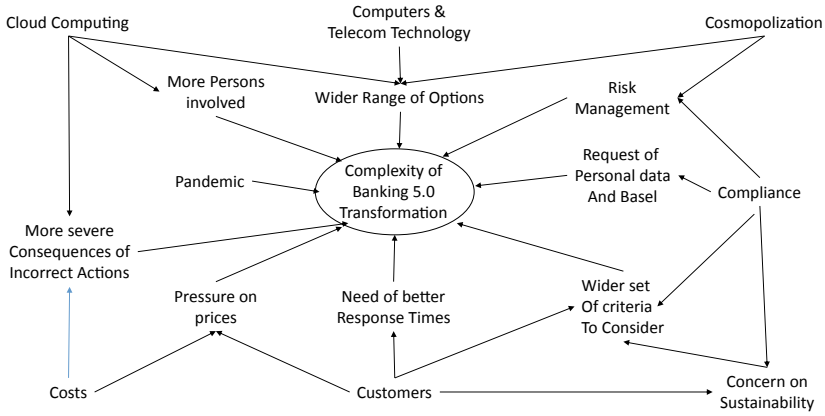


**Fig. 1.1** Impacts of transformation on banking (simplified)

at the center of a transaction, there should be a customer and his/her needs, not the bank.

From an internal point of view, the operations should be provided by an actor who could be a robot, a person, and in most of the cases, a combination of the two (a cobot). The robot should have Artificial intelligence (AI). This vision implies the importance of person–machine collaboration. In this new vision, AI is fundamental. Banking 5.0 is born out of an industrial revolution determined by AI, like the earlier four industrial revolutions were determined by other enabling technologies.

The 2020 pandemic is pushing even more to embark on the banking 5.0 transformation and become more agile, responsive, and connected enterprises. In a survey of Fortune 500 CEOs, 63% said that the Covid-19 crisis would accelerate their technological investment despite financial pressures.[7] One legacy of the pandemic could be the acceleration of the financial institution's transition to banking 5.0. This transition entails challenges.[8] Figure 1.1 summarizes some of these challenges.

[7] Jacobides, M. G., & Reeves, M. (2020). Adapt your business to the new reality. *Harvard Business Review, 98*(5), 74–81.

[8] Iansiti, M., & Lakhani, K. R. (2020). Competing *in the age of AI: Strategy and leadership when algorithms and networks run the world*. Harvard Business Press, Brighton, MA.

Banking 5.0 will bring a cultural transition to the customers.[9] The growth of banking for a financial institution will come from a change of approach. This approach must be transformed from merely passive to preventive and proactive, with a range of new services and products, new business models, and more considerable attention to prevention for defaults. Customer needs, knowledge, and expectations have expanded exponentially over the past years. Financial institutions need to adapt to their customers' needs. In an age of immediacy, continuous changes, and overwhelming choices in which loyalty is no longer a certainty, the sector must extend beyond its main products and services if it wants to keep and increase its customer base. It must innovate and change its approach. It is critical to understand who the banking customers are, and their needs expressed or implicit.[10]

In a highly competitive environment, current financial institutions can no longer rely on organic growth or internal innovation. As a result, mergers and acquisitions, equity partnerships, and collaborations are essential. The winners are the financial institutions able to launch and grow an ecosystem, with alliances with innovative start-ups, teaming up with fintech organizations, and joining even with some of their competitors. Merger and acquisitions (M&A) activity will focus on key markets and products. Access and use of solutions that allow improvements within the sector will come through acquisitions or partnerships. These potential opportunities require a holistic view of innovation. It would include distribution, new products, credit management ability, or improvements in the default settlement process.

The winners will be the ones which would invest in innovative platforms. They should rethink and revise their business model. A rapidly changing market and evolving industry require an unprecedented ability to do banking. Technological changes are essential. They are not enough. Knowing these changes and using them in the best way are different things. Financial institutions should use analytics, AI, and robots to benefit and use them as a basis for a radical banking 5.0 transformation.

[9] www.insuranceup.it/it/opinioni/deloitte-4-trend-per-le-assicurazioni-nel-2020/. Accessed 25 December 2019.

[10] Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Understanding customer expectations of service. *Sloan Management Review, 32*(3), 39–48.

Financial institutions are pure service providers that are highly data-founded. Digitization can influence financial institutions.[11] Already, large parts of the banking industry are robustly affected by digitization. In particular, the distribution is becoming heavily digitized. Digitization should strengthen the entire value network of the banking industry.[12] Digitization will change the profit and loss account of the financial institutions in three ways through new business models:

- Lower costs.
- Added revenues.
- More agility.

Digitization can impact pricing and competition. The real question is whether digitization-driven changes such as distribution accesses, competition types, and so on, be allowed under new regulations. The compliance framework should not restrict competition. Instead, the customer and data protection should be at the center of considerations.

A close relationship between the persons and the robots will characterize the fifth industrial revolution. The word robot in this book does not refer to the humanoid robots seen in the movies. Robots can be physical but also virtual. They can allow operators to act more rationally and with less operational effort. The joint and integrated work between the persons and the robots can supply the maximum benefits. This book considers industry 5.0 as the personalization of a solution and the need of a new relationship between persons and machines from this perspective. From the customer's point of view, the ultimate benefit is mass personalization. The two words are apparently in contrast, but they represent a goal not far in the future.

[11] Prognos, A. G. (2017). *Digitalisierung in der Versicherungswirtschaft*. Studie. Hg. v. vbw Vereinigung der Bayerischen Wirtschaft e.V. München, Germany.

[12] In the case of banking, the traditional concept of the value chain does not apply. Due to the importance of the information, it is necessary to consider a value network of banking. The term value "network" emphasizes the notion that a critical determinant of value to any particular user is the set, or network, of other users that are connected. In a value network, value is created through linking: the organization and facilitation of exchange between users (Stabell, C. & Fjeldstad, Ø. [1998]. *Configuring value for competitive advantage: On chains, shops, and networks*. Wiley, Hoboken, NJ).