

RESHAPING BANKING AND FINANCIAL SERVICES WITH DISRUPTIVE TECHNOLOGIES



Editors:
Monica Gupta
Priya Jindal
Piyush Gupta

Bentham Books

Reshaping Banking and Financial Services with Disruptive Technologies

Edited by

Monica Gupta

*Chitkara Business School, Chitkara University, Rajpura,
Punjab, India*

Priya Jindal

*Chitkara Business School, Chitkara University, Rajpura,
Punjab, India*

&

Piyush Gupta

Birla Global University, Bhubaneswar, Odisha, India

Reshaping Banking and Financial Services with Disruptive Technologies

Editors: Monica Gupta, Priya Jindal and Piyush Gupta

ISBN (Online): 979-8-89881-753-4

ISBN (Print): 979-8-89881-754-1

ISBN (Paperback): 979-8-89881-755-8

© 2026, Bentham Books imprint.

Published by Bentham Science Publishers Pte. Ltd. Singapore,

in collaboration with Eureka Conferences, USA. All Rights Reserved.

First published in 2026.

BENTHAM SCIENCE PUBLISHERS LTD.

End User License Agreement (for non-institutional, personal use)

This is an agreement between you and Bentham Science Publishers Ltd. Please read this License Agreement carefully before using the ebook/echapter/ejournal ("**Work**"). Your use of the Work constitutes your agreement to the terms and conditions set forth in this License Agreement. If you do not agree to these terms and conditions then you should not use the Work.

Bentham Science Publishers agrees to grant you a non-exclusive, non-transferable limited license to use the Work subject to and in accordance with the following terms and conditions. This License Agreement is for non-library, personal use only. For a library / institutional / multi user license in respect of the Work, please contact: permission@benthamscience.org.

Usage Rules:

1. All rights reserved: The Work is the subject of copyright and Bentham Science Publishers either owns the Work (and the copyright in it) or is licensed to distribute the Work. You shall not copy, reproduce, modify, remove, delete, augment, add to, publish, transmit, sell, resell, create derivative works from, or in any way exploit the Work or make the Work available for others to do any of the same, in any form or by any means, in whole or in part, in each case without the prior written permission of Bentham Science Publishers, unless stated otherwise in this License Agreement.
2. You may download a copy of the Work on one occasion to one personal computer (including tablet, laptop, desktop, or other such devices). You may make one back-up copy of the Work to avoid losing it.
3. The unauthorised use or distribution of copyrighted or other proprietary content is illegal and could subject you to liability for substantial money damages. You will be liable for any damage resulting from your misuse of the Work or any violation of this License Agreement, including any infringement by you of copyrights or proprietary rights.

Disclaimer:

Bentham Science Publishers does not guarantee that the information in the Work is error-free, or warrant that it will meet your requirements or that access to the Work will be uninterrupted or error-free. The Work is provided "as is" without warranty of any kind, either express or implied or statutory, including, without limitation, implied warranties of merchantability and fitness for a particular purpose. The entire risk as to the results and performance of the Work is assumed by you. No responsibility is assumed by Bentham Science Publishers, its staff, editors and/or authors for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products instruction, advertisements or ideas contained in the Work.

Limitation of Liability:

In no event will Bentham Science Publishers, its staff, editors and/or authors, be liable for any damages, including, without limitation, special, incidental and/or consequential damages and/or damages for lost data and/or profits arising out of (whether directly or indirectly) the use or inability to use the Work. The entire liability of Bentham Science Publishers shall be limited to the amount actually paid by you for the Work.

General:

1. Any dispute or claim arising out of or in connection with this License Agreement or the Work (including non-contractual disputes or claims) will be governed by and construed in accordance with the laws of Singapore. Each party agrees that the courts of the state of Singapore shall have exclusive jurisdiction to settle any dispute or claim arising out of or in connection with this License Agreement or the Work (including non-contractual disputes or claims).
2. Your rights under this License Agreement will automatically terminate without notice and without the

need for a court order if at any point you breach any terms of this License Agreement. In no event will any delay or failure by Bentham Science Publishers in enforcing your compliance with this License Agreement constitute a waiver of any of its rights.

3. You acknowledge that you have read this License Agreement, and agree to be bound by its terms and conditions. To the extent that any other terms and conditions presented on any website of Bentham Science Publishers conflict with, or are inconsistent with, the terms and conditions set out in this License Agreement, you acknowledge that the terms and conditions set out in this License Agreement shall prevail.

Bentham Science Publishers Pte. Ltd.

No. 9 Raffles Place

Office No. 26-01

Singapore 048619

Singapore

Email: subscriptions@benthamscience.net



CONTENTS

FOREWORD	i
PREFACE	ii
LIST OF CONTRIBUTORS	iv
CHAPTER 1 UNDERSTANDING THE PEOPLE'S PERCEPTION OF LOANS	1
<i>Trinley Paldon, Simran Paryani and Samarth Kulkarni</i>	
INTRODUCTION	1
LITERATURE REVIEW	3
RESEARCH METHODOLOGY	7
Data Analysis and Interpretation	9
DISCUSSION	12
LIMITATIONS AND SCOPE FOR FUTURE RESEARCH	15
CONCLUSION	16
REFERENCES	17
CHAPTER 2 CHALLENGES OF FINTECH REGULATIONS IN INDIA	21
<i>Akhil H. Bhatt and Kamini Shah</i>	
INTRODUCTION	21
LITERATURE REVIEW	22
OBJECTIVES OF THE STUDY	24
RESEARCH METHODOLOGY	24
FINTECH REGULATIONS IN INDIA	24
Main Regulatory Bodies of Fintech in India:	24
<i>Reserve Bank of India</i>	24
<i>National Payment Corporation of India:</i>	24
<i>Ombudsman Scheme: (Pradhan, 2021)</i>	25
<i>Unique Identification Authority of India:</i>	25
<i>Insurance Regulatory and Development Authority: (Pradhan, 2021)</i>	26
<i>Securities and Exchange Board of India (SEBI)</i>	26
Main laws for Fintech Regulations in India	26
MAJOR CHALLENGES OF FINTECH REGULATIONS IN INDIA	28
COMPARISON OF FINTECH REGULATIONS OF INDIA WITH GLOBAL FINTECH REGULATORIES	31
SUGGESTIONS AND RECOMMENDATIONS	32
CONCLUSION	33
REFERENCES	33
CHAPTER 3 EXPLORING ETHICAL DILEMMAS AND DECISION-MAKING IN THE FINANCIAL SECTOR	36
<i>Nehl Rehan, Charu Saxena and Shad Ahmad Khan</i>	
INTRODUCTION	36
REVIEW OF LITERATURE	38
METHODOLOGY	41
Data Analysis and Discussion	43
Reliability and Validity Analysis	43
DISCUSSION AND FUTURE IMPLICATIONS	49
CONCLUSION	50
REFERENCES	51

CHAPTER 4 CYBERSECURITY AND ETHICAL CONSIDERATIONS IN THE FIELD OF BANKING AND FINANCE	54
<i>Afia Shabi, Charu Saxena and Shakil Ahmad</i>	
INTRODUCTION	54
Several Examples of Cybersecurity Incidents in Banks	57
CYBERSECURITY CHALLENGES	57
Phishing Attacks	59
Ransomware	59
Malware Attacks	60
Insider Threats	60
Social Engineering	60
Distributed Denial-of-Service (DDoS) Attacks	61
Spoofing	61
Advanced Persistent Threats (APTs)	61
Trojans	62
Cloud-based Cyberattacks	62
ETHICAL CONSIDERATIONS	62
Data Privacy and Trust	63
The Integrity of Financial Systems	64
Fairness and Accountability	64
Responsibility for Security Breaches	64
Protection of Vulnerable Clients	64
Ethical Use of Resources and Sustainability	64
CONCLUSION	65
Future Research or Recommendations	66
REFERENCES	67
CHAPTER 5 APPLICATION OF ARTIFICIAL INTELLIGENCE IN FINANCIAL FRAUDS DETECTION: A BIBLIOMETRIC ANALYSIS	70
<i>Gurmeet Singh, Deepak Sood, Surinder Kaur, Simanpreet Kaur and Anjali</i>	
INTRODUCTION	70
AIM AND RELEVANCE OF THE STUDY	73
RESEARCH METHODOLOGY	73
Literature Retrieval and Analysis	73
The Literature Retrieval Procedure Followed in the Study	73
Techniques used for analysis	74
Bibliometric Analysis	75
<i>Trend of Articles Published from 2015 to 2024</i>	75
<i>Leading Journals</i>	75
<i>Leading Authors</i>	77
<i>Contributing Countries and Organizations</i>	77
<i>Keyword Analysis</i>	80
<i>Citation Analysis</i>	83
DISCUSSION	84
CONCLUSION	85
IMPLICATIONS	85
REFERENCES	86
CHAPTER 6 CYBERSECURITY RISKS IN ONLINE BANKING: COMPREHENSIVE ANALYSIS AND IMPLEMENTATION OF PROTECTIVE MEASURES	90
<i>Anju Rohilla, Priya Jindal, Sushma Sharma and Shubhangi Tyagi</i>	

INTRODUCTION	91
CYBERCRIME	92
WHY CYBERSECURITY IS IMPORTANT IN THE FINANCIAL SECTOR	92
CYBERCRIME COST TO FINANCIAL INSTITUTION	93
CYBER SECURITY	93
Cyber Risk to cybersecurity	94
Types of Cyber Security Risks in Online Banking	95
GLOBAL CASE STUDIES OF ONLINE BANKING BREACHES	100
CYBERSECURITY TOOLS IN THE ONLINE BANKING	100
CHALLENGES IN THE IMPLEMENTATION OF THE CYBERSECURITY	104
CONCLUSION	105
REFERENCES	106
CHAPTER 7 GREEN BANKING: FROM CONCEPT TO REALITY FOR A SUSTAINABLE PLANET	108
<i>Suruchi Sharma, Priyanka Gupta and Bindhia Joji</i>	
BACKGROUND	109
INTRODUCTION	110
CONCEPT AND VISION OF SUSTAINABLE PLANET	112
EVOLUTIONARY JOURNEY OF GREEN BANKING	113
DIMENSIONS OF GREEN BANKING	114
Net-zero Banking	114
Sustainable Banking	114
Green Banking	115
<i>Sustainable Finance and Green Financial Products</i>	116
<i>Operational Sustainability in Banking</i>	116
<i>Environmental Risk Management</i>	117
<i>Customer and Community Engagement</i>	117
<i>Policy Advocacy and Leadership</i>	118
<i>Green Banking Practices</i>	118
CHALLENGES AND OPPORTUNITIES FOR GREEN BANKING	119
GLIMPSES OF THE CURRENT SCENARIO	120
BENCHMARKS IN GREEN BANKING: CASES AND COMPARISON	121
FUTURE OF GREEN BANKING	123
CONCLUSION	124
REFERENCES	125
CHAPTER 8 RESHAPING PORTFOLIO MANAGEMENT: THE ROLE OF TECHNOLOGY IN MODERN ASSET MANAGEMENT	128
<i>Priya Jindal, Manpratik Singh and Monica Gupta</i>	
INTRODUCTION	129
CASE STUDIES IN PRACTICE	131
PROBLEM STATEMENT	131
NEED FOR STUDY	132
LITERATURE REVIEW	133
How Portfolio Management Strategies of Asset Management Firms are Impacted by Better Real-time Data Analytics	133
How the Asset Management Sector Uses Automated Procedures to Streamline Operations	134
Literature Gap	135
OBJECTIVES OF STUDY	136
METHODS OF DATA COLLECTION	137
Types of Research Used	137

Data Collection and Analysis Techniques	138
MAIN BODY- TEXT AND ANALYSIS	138
FINDINGS	139
DEVELOP THE CONCEPTUAL FRAMEWORK	140
CONCLUSION AND IMPLICATIONS	141
REFERENCES	142
CHAPTER 9 GREEN CRYPTOCURRENCY: CHALLENGES AND FUTURE OUTLOOK	145
<i>Maninder Kaur and Navgeet Singh</i>	
INTRODUCTION	145
GREEN CRYPTOCURRENCY	146
Cryptocurrency Mining Processes	148
Historical Annualized Electricity Consumption	151
LITERATURE SURVEY	153
CRYPTOCURRENCY'S DETRIMENTAL TO THE ENVIRONMENT	155
ADVANTAGES OF GREEN CRYPTOCURRENCY	156
Environmental Sustainability	156
Energy Efficiency	157
Positive Social Impact	158
Investor Appeal	158
Technological Innovation	159
Sustainable Cryptocurrencies	160
CHALLENGES AND FUTURE OUTLOOK: NAVIGATING THE PATH TO	
SUSTAINABLE BLOCKCHAIN SOLUTIONS	162
Shaping the Regulatory Landscape	162
Scaling Sustainability	162
Educating Investors and Raising Awareness	162
Fostering Collaboration and Partnerships	163
Standardizing Interoperability	163
Advancing Technological Innovations	163
CONCLUSION	164
REFERENCES	164
CHAPTER 10 BANKING REIMAGINED: UNVEILING THE IMPACT OF DISRUPTIVE	
TECHNOLOGIES ON FINANCIAL SERVICES	167
<i>Chandani Sharma and Danish Ather</i>	
INTRODUCTION	167
MAIN CHARACTERISTICS OF DISRUPTIVE TECHNOLOGY	168
THE JOURNEY OF FINANCIAL SERVICES: TRADITIONAL TO DIGITAL	169
Traditional Banking Era	169
The Rise of Technology: Automated Banking	169
The Rise of Online Banking	170
The Fintech Revolution	170
Introduction to Blockchain and Cryptocurrencies	171
Changes in Regulation and Open Banking	171
Future Outlook	172
A WIDE-THIN GATEWAY FOR DISRUPTIVE TECHNOLOGY IN BANKING	172
Data Analytics	173
Blockchain Technology	173
Cloud Computing	173
Fintech	173
Internet of Things (IoT)	173

5G Technology	173
Realities —AR and VR	174
3D Printing	174
DETAILED USES OF DISRUPTIVE TECHNOLOGY IN BANKING	174
AI as an Emerging Technology	174
AI in Personalization and Customer Engagement	175
AI and Risk Management	175
AI in Operational Efficiency	175
The Power of Blockchain Technology	176
Enhancing Accountability and Transparency	176
The Redefinition Through Extrapolation Using Fintech	177
FinTech and Digital Banking	177
P2P Lending and Crowdfunding	177
Resources for Robo-Advisors and Automated Investment Platforms	178
Cloud Computing: The Backbone of Modern Banking	178
Cloud-Based Banking	178
Storage and Security of Data in the Cloud	178
Cybersecurity in an Era of Digital Banking	179
RegTech: Streamlining Compliance	179
DIGITAL BANKING IS MOVING FROM THE ATMS TO THE VIRTUAL	180
The Rise of Cryptocurrency and Decentralized Finance (DeFi)	180
Open Banking: A Collaborative Approach To Disrupt Financial Services	181
Healthcare and Life Sciences: The New Frontier Of Regtech	181
The Banking Sector's Application through the Internet Of Things (IoT) and 5G	182
AR, VR, and Biometrics	182
FINANCIAL INCLUSION AND DEMOCRATIZATION OF BANKING	183
DISRUPTIVE TECHNOLOGIES: ETHICS AND REGULATIONS	184
CONCLUDING REMARKS	185
FUTURE SCOPE	185
REFERENCES	186
 CHAPTER 11 INDIA'S PROGRESS IN ADOPTING DIGITAL PAYMENTS: A STUDY OF PUNJAB	 187
<i>Baljinder Kaur and Jaswinder Singh</i>	
INTRODUCTION	187
Journey of the Digital Revolution of the Indian Banking System	187
UNDERSTANDING THE PAYMENT SYSTEM IN INDIA	188
TYPES OF PAYMENT SYSTEMS IN INDIA	188
Paper-based Payments	188
Digital Payment	188
<i>National Electronic Funds Transfer System (NEFT)</i>	189
<i>National Automated Clearing House (NACH)</i>	189
<i>Point of Sale (POS)</i>	189
<i>Real-time Gross Settlement (RTGS) System</i>	189
Other Payment Systems	189
<i>Clearing Corporation of India Limited (CCIL)</i>	189
<i>Mobile Banking</i>	189
<i>Bharat Bill Payment System</i>	190
<i>Payment Aggregators (PAs)</i>	190
RBI'S VISIONTOWARDS DIGITALPAYMENT SYSTEMS IN INDIA	190
DIGITAL PAYMENT	191

DIVERSE METHODS OF DIGITAL PAYMENTS	191
Banking Cards	191
Unified Payments Interface	192
Mobile Wallets	192
Mobile Banking	192
Internet Banking	192
USSD	192
Aadhaar Enabled Payment System	192
Micro ATM	192
Bank Pre-paid Cards	193
DRIVERS OF DIGITAL PAYMENT METHODS	193
CHALLENGES OF DIGITAL PAYMENT METHODS	193
RISE OF DIGITAL ECONOMY IN INDIA	194
Digital India Program	194
Demonetisation	195
Impact of COVID-19	195
ANALYSIS OF USERS' ATTRIBUTES RELATED TO THE CONSUMPTION OF DIGITAL PAYMENT METHODS	195
Research Methodology	196
Status of Using Digital Payment Methods	197
Preference of type of bank (Public/Private bank)	197
Use of the Device for the Execution of Digital Payments	198
Frequency of use of digital payment methods	198
Spending Behaviour Towards Using Digital Payment Methods	200
Satisfaction Level and Digital Payment Methods	202
CONCLUSION	203
REFERENCES	204
 CHAPTER 12 FINANCIAL FRAUD AND DIGITAL CRIMES IN THE ERA OF DIGITAL DISRUPTIONS: CHALLENGES, TRENDS, AND CYBERSECURITY STRATEGIES	206
<i>Vijay Prakash Gupta, Divya Khatter and Monika Bansal</i>	
INTRODUCTION	207
An Overview of Digital Crimes and Financial Frauds	207
Digital Disruptions and Financial Fraud	208
CYBERSECURITY: A VALUABLE ASPECT IN THE DIGITAL AGE	208
UNDERSTANDING FINANCIAL FRAUDS IN THE DIGITAL AGE	210
EVOLUTION OF FINANCIAL CRIMES IN THE DIGITAL ECONOMY	210
As Companies Made the Shift to the Internet	210
<i>Case Study 1: Indian UPI Frauds</i>	211
<i>Case Study 2: The Global Crypto Fraud FTX Collapse</i>	212
Key Drivers of Financial Frauds in the Digital Era	212
IMPACT OF FINANCIAL FRAUDS ON INDIVIDUALS, BUSINESSES, AND ECONOMIES	212
Effect on Individuals	212
Impact on Businesses	213
Digital Crimes in the Age of Disruptive Technologies	214
Cybersecurity Frameworks and Risk Management Approaches	216
Regulatory and Compliance Measures for Digital Fraud Prevention	217
Application of AI and ML in Cybersecurity	218
Best Practices for Organizations to Strengthen Cybersecurity Measures	218
Public Awareness and Digital Literacy Initiatives	218

Challenges and Future Trends in Digital Crime Prevention	220
Digital Crime Prevention Challenges	220
Next Trends in Digital Crime Prevention	220
Emerging Threats in Financial Frauds and Cybercrime	221
Case Study: AI Deep Fake Fraud in Bengaluru, India (2023)	221
The Role of Big Data and Decision Intelligence in Fraud Detection	221
Ethical and Privacy Considerations in Cybersecurity Policies	222
The Future of Digital Security: Trends and Technological Innovations	222
Summary of Key Findings	223
Policy Recommendations for Governments and Regulatory Bodies	224
Strategic Recommendations for Businesses and Financial Institutions	224
The Road Ahead: Strengthening Cybersecurity for a Fraud-Free Digital Economy	225
CONCLUSION	226
Practical and Management Implications	226
Policy Recommendations for Governments and Regulatory Bodies	226
Limitations of the Study	227
Future Research Horizon	227
REFERENCES	227
SUBJECT INDEX	229

FOREWORD

We stand at a defining moment for the financial services industry—an inflection point shaped by disruptive technologies that are redefining the rules of engagement. In an era where technology evolves at lightning speed, the banking and financial services sector is undergoing a transformation that was scarcely imaginable just a few years ago. Today, artificial intelligence, blockchain, robotics, and cloud computing are not just tools for operational efficiency—they are reshaping customer expectations, risk frameworks, and the very essence of financial interactions.

In this context, *Reshaping Banking and Financial Services with Disruptive Technologies* arrives as a timely and impactful contribution. It expertly navigates the technological currents reshaping our industry, offering a multi-dimensional and systematic analysis of how innovation is driving a bottom-up reconfiguration of core banking operations, customer experiences, and risk management systems.

Disruptive technologies have a profound impact on financial services. Versatile blockchain creates innovative payment systems as well as secure international transactions today. Financial institutions are leveraging AI and machine learning to forecast market movements, provide automated investment recommendations, and identify fraudulent transactions. At the same time, cloud computing is allowing financial institutions to become increasingly agile, scalable, and data-driven.

The Editors—Dr. Monica Gupta, Dr. Priya Jindal, and Dr. Piyush Gupta—have brought together insights from leading academics and practitioners to produce a work of both scholarly depth and practical relevance. Their analysis of blockchain’s potential in revolutionizing payment systems, AI’s role in fraud detection and investment advisory, and the agility offered by cloud solutions is both comprehensive and forward-thinking.

However, as technology advances, it brings with it new challenges, and issues surrounding cybersecurity, data privacy, ethical standards, and regulatory compliance are more pressing than ever. This book discusses these complexities, offering nuanced perspectives on data ownership, trust, and the ethical landscape in an increasingly digital world.

As Director of Innovative Financial Management at a financial advisory firm, I witness firsthand how technology is reshaping financial services for the better. This book is more than just a scholarly work—it offers insights backed by research for bankers, financial advisors, fintech innovators, and policymakers. Its exploration of emerging trends, best practices, and strategies for thriving in a tech-driven ecosystem is indispensable.

I wholeheartedly commend the authors for their dedication and insight. This book is a beacon for anyone seeking to understand and navigate the future of finance. The road ahead demands agility, vision, and an unwavering commitment to innovation. This volume will serve as an essential companion on that journey.

Amanjot Kaur
Innovative Financial Management
Financial Advisory Firm, Chandigarh
India

PREFACE

Disruptive technologies have a rapid impact on the sector and bring about significant changes in financial services income. Disruptive technologies are known as innovations that make business entrepreneurs and operational managers alter the way of their business operations and the process of managerial activities. They innovate new alternative ways for business operations. Nowadays, the service sector industry, especially the banking and financial service sector, is undergoing a rapid transformation. Disruptive technologies such as equity crowdfunding, peer-to-peer lending, e-payment systems, mobile payment systems, and digital wealth management advisory are fundamentally altering the landscape of the banking and financial services industry. Financial institutions and all banking entities transform service delivery, client relations, and risk management operations using AI, blockchain, robotics, cloud computing, and data analytics. Technical advances are more than gradual upgrades to existing operations — they are transforming every process in banking and finance. Over the past few years, improved efficiency combined with transparency and better customer-centric services have been key benefits realized through digitalization and automation. Blockchain technology makes financial transactions simpler and more secure, enabling faster transactions, while robots and predictive data analysis add more fun to the user experience. However, there are new challenges that come with the increasing reliance on technology, which mainly revolve around data privacy and security, in addition to ethical dimensions.

The book titled "Reshaping Banking and Financial Services in the New Disruptive Technological Age" attempts to identify and explain the key disruptive technologies that are reshaping and changing the business operational procedures of banking and financial services. The book depicted how technologies like cloud computing, blockchain, AI, and the IoT are both used and affect. The critical analytical approach has discussed both the positive and negative impacts of disruptive technologies in the banking industry organisations. In addition, it highlights current challenges, trends, and future research directions.

In the competitive financial services industry, customer experience becomes a strong differentiator. This book explores how financial institutions are treating themselves to tailor-made experiences for millions through hyper-personalization, immersive technologies, and real-time data analytics. It also explores the evolution of customer journeys in the metaverse, the development of virtual branches, and the potential for new use cases and experiences in finance. The book depicted how technologies like cloud computing, blockchain, AI, and the IoT are both used and make their impact. It shows how banks use technologies to directly make transactions at lower cost or with better service quality, or indirectly cut expenses; use artificial intelligence, blockchain, and cryptocurrency. It also outlines how future financial interactions could get reimaged — from quantum computing to metaverse adoption.

As more and more of these disruptive technologies are adopted, the increasing reliance on security will further drive the demand for secure solutions in the space. The book also addresses cybercrime, financial fraud, and ethical dilemmas. It also highlights green banking initiatives focused on sustainable and responsible financial practices in an increasingly digital world.

The book is a timely and essential contribution to the field of banking and finance. With a rapidly-changing financial landscape, staying on top of the latest technological trends is crucial. With its fresh, riveting storylines, this book is an essential read for banking practitioners, fintech entrepreneurs, researchers, and regulators to comprehend the significance of disruptive technologies. New technologies and methodologies (software

development, engineering, *etc.*) are providing all of these insights into new trends, best practices, and how to use technology to overcome your limits, creating growth, efficiency, and resilience. Those needs are to understand and navigate profound changes by innovations such as Artificial Intelligence, Blockchain technology, Internet of Things (IoT), Virtual Reality (VR), Robotic Process Automation (RPA), quantum computing, and cloud computing, some of the important disruptive technologies that are intending operational managers to implement changes in their ongoing business operational procedure. The book is intended to provide deep insight into the importance of disruptive technologies so that banking professionals who are positioned in managerial positions can enhance business competitiveness by implementing change management with the upcoming changes in the banking and financial industry. Additionally, the importance of economic sustainability, cybersecurity, and ethical considerations in the new technological landscape has been emphasized. This is the hope that the book will serve as a valuable resource with comprehensive coverage of all the factors that impact the banking and financial industry.

The editors wish to acknowledge all of the contributors, researchers, and experts whose knowledge made this book possible. We expect this collection to enable these contributors to give readers insight into the evolution of these disruptive technologies and their impact on the future of banking and finance.

Monica Gupta

Chitkara Business School
Chitkara University, Rajpura, Punjab
India

Priya Jindal

Chitkara Business School
Chitkara University, Rajpura, Punjab
India

&

Piyush Gupta

Birla Global University
Bhubaneswar, Odisha
India

List of Contributors

Akhil H. Bhatt	Department of Business Studies, Sardar Patel University, Anand, Gujarat, India
Afia Shabi	University School of Business, Chandigarh University, Mohali, Punjab, India
Anju Rohilla	Faculty of Management and Commerce, SRM University, Delhi-NCR, Sonipat, Haryana, India
Anjali	Department of Commerce, Chandigarh School of Business, Chandigarh Group of Colleges, Mohali, Punjab, India
Bindhia Joji	School of Business and Management, Christ University, Bengaluru, India
Baljinder Kaur	Chandigarh Business School of Administration, CGC Landran, Mohali, Punjab, India
Charu Saxena	University School of Business, Chandigarh University, Mohali, Punjab, India
Chandani Sharma	Department of CSE, MMICTBM (MCA), Maharishi Markandeshwar (Deemed to be University), Ambala, Haryana, India
Deepak Sood	Chitkara Business School, Chitkara University, Rajpura, Punjab, India
Danish Ather	Department of Artificial Intelligence, Tashkent University of Information Technologies, Tashkent, Uzbekistan
Divya Khatter	Department of Commerce, Dyal Singh College (M), University of Delhi, Delhi, India
Gurmeet Singh	Chitkara Business School, Chitkara University, Rajpura, Punjab, India
Jaswinder Singh	Department of Mechanical Engineering, Chitkara University Institute of Engineering and Technology, Chitkara University, Rajpura, Punjab, India
Kamini Shah	Department of Business Studies, Sardar Patel University, Anand, Gujarat, India
Manpratik Singh	Chitkara Business School, Chitkara University, Rajpura, Punjab, India
Monica Gupta	Chitkara Business School, Chitkara University, Rajpura, Punjab, India
Maninder Kaur	Chandigarh Group of Colleges (CGC) Landran, Mohali, Punjab, India
Monika Bansal	Department of Management Studies, Deen Dayal Upadhyaya College, University of Delhi, Delhi, India
Nehl Rehan	University Institute of Liberal Arts and Humanities, Mohali, Punjab, India
Navgeet Singh	Department of Good Governance and Information Technology (DGGIT), Mohali, Punjab, India
Priya Jindal	Chitkara Business School, Chitkara University, Rajpura, Punjab, India
Priyanka Gupta	Department of Management Studies, Graphic Era (Deemed to be) University, Dehradun, Uttarakhand, India
Priya Jindal	Chitkara Business School, Chitkara University, Rajpura, Punjab, India
Simran Paryani	Xavier Institute of Management & Entrepreneurship, Bangalore, Karnataka, India
Samarth Kulkarni	Xavier Institute of Management & Entrepreneurship, Bangalore, Karnataka, India
Shad Ahmad Khan	College of Business, University of Buraimi, Al Buraimi, Oman
Shakil Ahmad	School of Business, University of Creative Technology, Chittagong, Bangladesh

Surinder Kaur	Department of Commerce, Post Graduate Government College, Chandigarh, Punjab, India
Simanpreet Kaur	Department of Commerce, Chandigarh School of Business, Chandigarh Group of Colleges, Mohali, Punjab, India
Sushma Sharma	Faculty of Management and Commerce, SRM University, Delhi-NCR, Sonipat, Haryana, India
Shubhangi Tyagi	Faculty of Management and Commerce, SRM University, Delhi-NCR, Sonipat, Haryana, India
Suruchi Sharma	School of Management, Graphic Era Hill University, Dehradun, Uttarakhand, India
Trinley Paldon	Xavier Institute of Management & Entrepreneurship, Bangalore, Karnataka, India
Vijay Prakash Gupta	Institute of Business Management, GLA University, Mathura, Uttar Pradesh, India

CHAPTER 1

Understanding The People's Perception of Loans

Trinley Paldon^{1,*}, Simran Paryani¹ and Samarth Kulkarni¹

¹ *Xavier Institute of Management & Entrepreneurship, Bangalore, Karnataka, India*

Abstract: This research examines the direct effects of societal influences and confidence in banks on loan perceptions and explores whether respondents with more positive views on loans are more likely to apply for loans, irrespective of their social factors and trust in the bank. It is found that societal influences and confidence in banks have a significant positive effect on people's perceptions of loans. However, monthly household income had a small, non-significant effect, suggesting that income alone may not decisively shape attitudes toward loans. Through this investigation, the study seeks to offer nuanced insights into the dynamics of loan perceptions in an urban environment (Bangalore City). The study provides valuable implications for policymakers and financial institutions seeking to better understand and meet the diverse borrowing needs of urban populations.

Keywords: Bank, Banking services, Customer experience, Economic growth, Indian economy, Interest rates, Loan, Options, Personal loan market, Risk, Societal influence, Trust in banks.

INTRODUCTION

The SIBC (Sector-wise and Industry-wise Bank Credit) return submitted by the scheduled commercial banks to the RBI has categorised the retail/personal loans into: 1) housing loans, 2) vehicle loans, 3) credit card loans, 4) loans for consumer durables, 5) advances against fixed deposits, 6) advances against shares and bonds, 7) loans against gold jewellery, 8) education loans, and 9) other personal loans. On the basis of the SIBC return report, this paper focuses on the general retail borrower's experience with their banking service provider. The term 'retail shift' is observed as the retail credit outstanding increased from 30.7 per cent in March 2022 to 32.1 per cent in March 2023; the highest among other sectors. Such increase in a segment resulted from the better asset quality and Gross Non-performing Assets (GNPA) in retail loans being the lowest at 1.2 per cent (Sector-wise GNPA total percentage shares at 13.9 per cent) among sectors, whereas it was 2.7 per cent (Sector-wise GNPA total percentage shares at 27.3 per cent) for

* **Corresponding author Trinley Paldon:** Xavier Institute of Management & Entrepreneurship, Bangalore, Karnataka, India; E-mail: trinley@xime.org

services, 3.5 per cent (Sector-wise GNPA total percentage shares at 29 per cent) for industry and 6.2 percent for agriculture (Sector-wise GNPA total percentage shares at 29 per cent) (Financial Stability Report, 2024). Other factors like the growing Indian economy, the rise of the middle class, and demographic dividend fuelling the potential purchasing power also contributed to the 'retail shift'.

Dependency on an instrument of investment comes from financial planning based on an individual's financial literacy (Bernanke, 1983). The basis of financial literacy is to understand financial goods and make informed decisions about investing and saving, considering the trade-off between risk and reward (Verma, 2017). Many banks, both public and private, compete in the personal loan market (Tiwari & Somani, 2021). By gathering savings from depositors and lending to borrowers, banks act as financial intermediaries, enabling the economy to expand (Tiwari & Somani, 2021). This transformation is prominent for economic growth (Berger & Bouwman, 2009).

With this background, this research tries to understand the banking experience of the retail borrowers and the factors that influence the customer experience in choosing banking, including societal influences and confidence in banks.

The following are the research hypotheses:

H1: Societal influences and confidence in banks have a significant positive effect on people's perception of loans.

H2: There is a moderating effect of monthly household income on societal influence and confidence in banks over people's perception of loans.

This study is novel in that, for the first time, the CCA tool has been used to examine the relationships among the selected variables, and the study's sample is collected from the urban working class in Bangalore during the post-COVID-19 period. The period of the study is unique in terms of finding that none of the respondents are seen as favouring online platforms for taking loans. They are found to be very cautious about using the online loan offering from the online payment platform, yet all of the respondents are using online payment, namely Gpay, PAYTM, etc.

The next section is a list of reviews on topics related to loans from banking services, and satisfaction of the services as determinants of choosing a particular bank. After review, the section follows the research methodology, data analysis and results, conclusion, and limitations and scope for future research sections.

LITERATURE REVIEW

It is documented that about 39% of adults who have borrowed formal loans are financially literate, and that comparisons of interest rates for Real Estate Loans across different banks showed varied rates (Verma, 2017). Financial services giving varied rates, particularly in India, where there is a lack of financial literacy and a lack of financial access, can be a concern and may affect selecting a favourable particular bank (Agarwal *et al.*, 2015).

More than 90 percent of respondents preferred availing a gold loan compared to other types of loans (Chiang & Cheng, 2011). Borrowers of Public Sector Bank's loans were highly satisfied with the security pledged but dissatisfied with the quality of services provided (Malarvizhi & Angel, 2019). There is a discernible relationship between male and female bank customers' perceptions of loan schemes (Tiwari & Somani, 2021). Moreover, the probability of taking a loan increases with the probability of owning a house if a person is employed and has a bank account. The results also reveal that those who own a house have a lower probability of taking a loan from the informal sector (Ray *et al.*, 2019). The critical role of banks in meeting diverse financial needs and their growth dynamics is influenced by factors like customer satisfaction, service costs, and technological advancements. Additionally, it assesses the quality of services across public, private, and foreign banks, shedding light on the evolving landscape of banking services amid technological advancements and changing customer expectations (Patro, 2015). Middle-aged individuals are found opting for home loans, with a preference among males. Businesspersons are more likely to seek home loans, primarily for home purchases. The majority of borrowers prefer loans sanctioned within a month, with features such as easy processing, responsive customer service, and streamlined procedures. However, higher interest rates and legal formalities are less influential (Soundarya & Selvarani, 2019). It is acknowledged that there is an opportunity in retail banking, but it notes potential risks like household indebtedness. Competition among Housing Finance Companies, urging a prioritized housing sector for economic benefits, is also noted. The study also stresses the need for skilled human resources, particularly in institutions like the State Bank of India, to manage retail credit portfolios efficiently (Gaur, 2009). Another study discusses changes in the global and Indian banking industries over the past two decades, emphasizing the impact of communication and information technology driven by the Information Technology Revolution (Kamakodi & Khan, 2008).

A study involving 250 respondents revealed that factors such as processing fees, interest rates, and service quality experience significantly impact customers' choices (Sughana & Sheela, 2021). The study conducted in Himachal Pradesh

CHAPTER 2

Challenges of Fintech Regulations in India**Akhil H. Bhatt^{1,*} and Kamini Shah¹**¹ *Department of Business Studies, Sardar Patel University, Anand, Gujarat, India*

Abstract: Fintech has witnessed exceptional growth in India over the last decade. India has the highest Fintech adoption rate of 87% in the world against the global average adoption rate of 64%. It has been assumed that the Fintech sector will have a valuation of over \$150 billion by 2023. All this growth and the rapid pace of digitization have posed challenges to the regulators. This chapter will attempt to study how Fintech is being regulated in India and what are the major challenges in front of the government. Additionally, the paper will also discuss the future path of regulating Fintech in India. A healthy regulatory environment can expedite fintech adoption. With this aim, the study will present the picture of Fintech regulations in India.

Keywords: Data privacy, Financial technology, Fintech adoption, Fintech ecosystem, Fintech India, Fintech industry, Fintech regulators, Fintech regulations, Fintech sector, Fintech challenges in India.

INTRODUCTION

Fintech or Financial technology refers to the designing and provisioning of financial services by using new technological innovations (PwC India, 2021). The success of these innovations has changed the way financial services are provided. It has created significant disruption and posed a major challenge for traditional banking. Fintech is more consumer-centric and very cost-effective compared to the traditional banking system. This is why, in recent times, non-banking institutions have also started providing financial services with the use of technology.

The Fintech sector in India is one of the fastest-growing markets in the world. The Indian fintech market, after the US and China, is the largest Fintech ecosystem in the world. The market size of the Indian FinTech industry was \$31 billion in 2021 and is estimated to reach approximately \$150 billion by 2025. 16 Fintech companies in India have gained 'Unicorn status' as of April 2022 (Invest India, 2022). India also has the highest Fintech adoption rate of 87%, and the global

* **Corresponding author Akhil H. Bhatt:** Department of Business Studies, Sardar Patel University, Anand, Gujarat, India; E-mail: akhilbhatt26797@gmail.com

pandemic has made the adoption of AePS (Aadhaar-enabled Payment Systems), UPI, mobile wallets, *etc.*, more important than ever.

Each industry faces different challenges in the business environment and has its own concerns to deal with. The Fintech industry, with all this success over the last decade, also has some concerns, like the number of unbanked and underbanked populations, cyber threats, infrastructural issues, lack of tech expertise, *etc.* (Finezza, 2020) are affecting the Fintech industry. One of the major concerns among all is the way Fintech is being regulated in India (Adil, Khan, Khan, & Ghani, 2020). There is no particular set of laws and regulations governing fintech services and products in India. It is a big challenge for regulators to keep up with continuous innovations (Sanyal, 2021). However, the government of India, with the Reserve Bank of India (RBI), is trying to understand the latest fintech innovations and promote regulations that will enhance its service without compromising its security.

LITERATURE REVIEW

The rapid growth of financial technology (Fintech) in India has transformed the financial sector, introducing new business models for service delivery, but simultaneously creating significant regulatory complexities. A critical challenge for Indian authorities is finding an equilibrium that harnesses innovation while rigorously safeguarding consumer interests and financial stability.

A primary structural issue in the Indian Fintech ecosystem is the multi-regulatory agency model, where Fintech services intersect the jurisdictions of the RBI, SEBI, IRDAI, and MeitY. This fragmented oversight frequently results in conflicting standards, overlapping compliance requirements, and operational hurdles for firms (Agu, Abhulimen, Obiki-Osafiele, Osundare, Adeniran, & Efunniyi, 2024). This complexity is compounded by regulatory lag, as the pace of technological innovation consistently outstrips the capability of regulators to update frameworks, leading to gaps in oversight and unaddressed threats.

In an effort to balance this, the RBI, SEBI, and IRDAI have introduced regulatory sandboxes for testing new products. However, these tools for innovation promotion are limited by their narrow scope and a slow approval process. Moreover, the lack of strategic alignment between these sector-specific sandboxes restricts the development of holistic solutions, leading to renewed calls for a unified Fintech regulatory body (Gupta, Kaur, & Yuliantiningsih, 2024).

The rise of digital lending platforms introduced risks related to predatory practices and inadequate disclosure. While the RBI has issued guidelines to enhance transparency and mandate the monitoring of third-party platforms, consistent

adherence across the swiftly climbing industry remains a major challenge (Allahrakha, 2023). The functionality of Fintech relies on the collection and storage of sensitive consumer data, creating substantial potential for breaches and identity theft. The Digital Personal Data Protection Act (DPDP Act), 2023, aims to address this by mandating informed consent and imposing data protection conditions, yet questions about its implementation and enforcement—especially for globally operating Fintech companies navigating cross-border data flows—persist (Aslan & Samet, 2020).

The pseudonymous nature of digital transactions, particularly with cryptocurrency, heightens the risk of money laundering. The RBI and the Financial Intelligence Unit (FIU) mandate strict KYC and transaction monitoring to meet international standards (*e.g.*, FATF's Travel Rule). However, the decentralized and rapid evolution of these virtual asset markets complicates enforcement, resulting in market ambiguity and operational limits for firms (Asmar & Tuqan, 2024).

Consumer protection is the paramount regulatory issue, as the spread of digital services exposes consumers to new risks like hidden fees and service interruptions. This challenge is amplified by a widespread lack of financial literacy, leaving many unaware of their rights or avenues for recourse (Gahlot & Ghosh, 2023). Implementing consumer protection guidelines throughout the disjointed Fintech environment remains a daunting task.

The regulatory horizon is further complicated by emerging technologies such as AI, blockchain, and DeFi. AI-based credit models risk perpetuating algorithmic bias, while blockchain's decentralized nature challenges traditional regulatory oversight. This difficulty extends to cryptocurrency regulation. The government is working on a nuanced stance, including exploring a Central Bank Digital Currency (CBDC) and the proposed Cryptocurrency and Regulation of Official Digital Currency Bill, but clear directives on taxation, cross-border transactions, and consumer protection remain absent (Vijayagopal, Jain, & Viswanathan, 2024).

Finally, the success of initiatives like the Unified Payments Interface (UPI) highlights the importance of interoperability and standardization. As Indian firms expand globally, the cross-border nature of Fintech necessitates continuous global cooperation with bodies like FATF, BIS, and IOSCO to harmonize regulatory approaches, efficiently manage emerging risks, and balance the goals of financial inclusion with regulatory quality. The ultimate success of Indian Fintech regulation depends on its ability to forge an agile, unified framework.

CHAPTER 3

Exploring Ethical Dilemmas and Decision-Making in the Financial Sector

Nehl Rehan¹, Charu Saxena^{2,*} and Shad Ahmad Khan³

¹ University Institute of Liberal Arts and Humanities, Mohali, Punjab, India

² University School of Business, Chandigarh University, Mohali, Punjab, India

³ College of Business, University of Buraimi, Al Buraimi, Oman

Abstract: The aim of the study is to investigate the impact of ethical dilemmas on the financial markets and find the best practices for ethical decision-making to ensure long-term profitability and sustainability. Ethical dilemmas within the financial sector pose significant challenges, often resulting in decisions that prioritize short-term gains over long-term sustainability and ethical principles. Understanding the underlying causes and determining effective approaches for ethical decision-making is essential for fostering trust, integrity, and long-term viability in the financial industry. A comprehensive review of existing literature is conducted to identify common ethical dilemmas, root causes, and current practices in ethical decision-making within the financial sector, in terms of ethical factors. An attempt has been made to assess perceptions of the impact of ethical factors on financial markets. The data has been collected through an adapted questionnaire from the financial market professionals. Ethical factors such as 'Corporate Law Psychopathy,' 'Competitive Pressures,' 'Ethical Markets,' and 'Relativism' are positively influencing the ethical dilemma in financial markets. Interestingly, 'Psychological Egoism,' 'Corporate Law Psychopathy,' and 'Relativism' are negatively influencing the ethical dilemmas in financial markets. This research contributes to the existing body of knowledge by assessing the impact of ethical dilemmas on decision-making in the financial sector. By identifying root causes and best practices, this study aims to provide actionable insights for industry professionals, regulators, and policymakers to promote ethical conduct and long-term sustainability in finance.

Keywords: Ethical dilemmas, Ethical decision making, Financial market, Psychopathy, Relativism, Sustainability.

INTRODUCTION

Dilemma, Conundrum, perplexity, predicament, or indecisiveness are merely synonymous terms, but lead to a meaning which is the inability or having

* Corresponding author Charu Saxena: University School of Business, Chandigarh University, Mohali, Punjab, India. E-mail: saxena.charu16@gmail.com

difficulty in choosing or making a decision between two or more options (Kramer, 2016). What is so wonderful about the term 'Dilemma' is that it is so obsolete in the contemporary world that some might confuse it with 'Delusion' (Guerrero & Andersen, 2013). This inability occurs generally, especially when the perceived outcome of either of the alternative choices is undesirable (Shou & Song, 2017). The question is whether what is measured or the extent of making such dogmatic choices, so to speak, renders them ethical? A dilemma, and then coming to an emphatic decision, can be ethical or not, which is a paradox (Fleischmann *et al.*, 2019). Such Ethical Dilemmas shouldn't go unnoticed, particularly in the financial, corporate, or entrepreneurial markets. Observationally, this unfit decision-making and unscrupulous, long-standing behavior have only proved to be lacking in self-sustainability, have only short-term gains, and seek individual benefits, whereas it should have improved the working environment and profitability for the masses.

Let us take the case of X Corp., founded by Elon Musk, acquiring Twitter and renaming it as 'X-twitter'. As soon as Musk took over the corporation, he downsized Twitter's 7500 employees to almost half (Das, 2019). A rash decision turned into a robust ethical dilemma when Musk realized he needed a few of them and then called them back to work. This is a purely egocentric approach, later discussed as a factor of Psychological Egoism (Anderson, 1993). The short-term benefit of having to sign fewer paycheques was accompanied by a halt in various ongoing processes, which was reflected in the drop in the company's overall worth in the long run (Baker & Yannelis, 2017).

Several causes of such puny adaptational resolves are discussed in this study. Investors gasping and trying to grab the opportunities from the financial market's monetary fluctuations, generally due to their relative behaviour and uncanny comparison to other competitors, lead them to create an inefficient market impact, tempering the market volatility (Caporale *et al.*, 2021). 'Competitive Pressures' and 'Corporate Law Psychopathy' are a few factors that drive these eerie decisional anomalies (Van de Ven & Jeurissen, 2005). Along with the above two, Relativism and Idealism are also taken into consideration. Corporates, such as major Legacy companies like Procter & Gamble, Unilever, ITC Limited, and Nestle, need to uphold their Enduring, uprooted ideologies, which they have built their entire empires upon (Park, 2005). Apple Computers Inc. eventually changed its name to Apple Inc. in the year 2007, which occurred after 11 years of the company's inception in the year 1996. This was a strategic move by the former CEO, Steve Jobs, to foster a sense of idealism and free will, suggesting that Apple is not confined to the development of computer technology but encourages growth beyond basic computing devices. These ideologies have kept them going on and on through the patches of time. Idealism is reflected primarily in such legacy

company leadership, with which they take actions that are firm and stern in nature, in order to maintain the long-term augmentation (Moore & Schmitz, 2008). The relative attitude of these giants has also been corroding the efficiency of stakeholders and financial investors, and has left them unpoised and unable to make viable choices that will prove advantageous for the financial industry. In terms of ethical predicaments, Idealism and Relativism seem to be essential features that affect the prediction of judgmental behaviours and characteristic business ethics and philosophy (Dorrien, 2003). Relativism is a strong indicator of an individual investor or bearer's moral identity. Adorning all moral compasses to their highest degree and incubating beliefs that are culturally different yet are relatively implacable is relativism (Harding, 1992). Another Relative Factor is 'Ethical Markets.' Under the jurisdiction of such preluding markets, the decisions are made by the investors using prewritten rulebooks and policy terms and conditions. This leaves little room for the character on the impact-creating end to think for himself and apply his own set of values and scruples (Haigh & Hazelton, 2004).

The aforementioned factors are observed to create this study. These are creating a significant impression on the integrity, unity, and collective operability of the Gigantic Financial World as a whole. This study will shed light on how tainted the decision-makers' judgment and moral compass can become, which eventually degrades the virtuous standing of large corporations and entrepreneurial investors (Kim *et al.* 2019). These factors are identified by conducting a perception survey using a questionnaire responded to by various top corporate officials of the financial world. These factors are studied empirically to find out how they impose unwelcome and non-profitable decisional actions on the financial markets. A few factors also leave room for positive constructivism on the impact factor. The paper aims to search for the best means to neutralize and eliminate such Ethical Dilemmas.

REVIEW OF LITERATURE

Ethics, etymologically, originates from the Greek word 'ethos' or the Greek phrase 'he ethike tekhne', which literally translates to 'the science of morals'. The word Dilemma can be broken into two words: 'Di', which means 'twice', and 'Lemma', which means 'premise' (Fusco, 2008). A dilemma becomes a moral question when viewed in light of its ethical credibility.

The "Rational Choice Theory" posits that individuals make decisions by systematically evaluating alternatives and selecting the option that maximizes personal utility (Oppenheimer, 2008). Within financial markets, this aligns with constructs such as psychological egoism and competitive pressures, where

CHAPTER 4

Cybersecurity and Ethical Considerations in the Field of Banking and Finance

Afia Shabi^{1,*}, Charu Saxena¹ and Shakil Ahmad²

¹ University School of Business, Chandigarh University, Mohali, Punjab, India

² School of Business, University of Creative Technology, Chittagong, Bangladesh

Abstract: The banking and finance sector depends upon cybersecurity, together with ethical considerations in order to maintain trust, operational integrity, and security. This book chapter investigates major cybersecurity challenges that arise in banks and other financial organizations and also explores various ethical considerations resulting from technological advancements. In the beginning, the author defines the cybersecurity status of banks and explains why it is necessary to safeguard confidential financial data from various cyber threats, along with some of the incidents of cyber threats in banks.

Additionally, this chapter outlines the various cybersecurity challenges in the banking and finance industry, including ransomware, phishing and malware attacks, spoofing, insider threats, distributed denial-of-service (DDoS) attacks, social engineering, trojans, advanced persistent threats (APTs), and cloud-based cyberattacks. Cybersecurity raises unique ethical concerns that are both similar to and distinct from those raised by artificial intelligence in the context of financial institutions.

Furthermore, in the last section, an overview of the ethical considerations related to cybersecurity in banking and financial institutions is provided in detail. In a rapidly evolving digital environment, this chapter highlights new developments in cybersecurity, potential cybersecurity challenges, and ethical considerations to be addressed in the future.

Keywords: Banks, Cybersecurity, Cyberattacks, Challenges, Ethical considerations, Financial institutions.

INTRODUCTION

Banking and finance are significant contributors to the overall growth of the economy. Finance and credit access move people and institutions and facilitate entrepreneurship and innovation, two major components of economic growth

* Corresponding author Afia Shabi: University School of Business, Chandigarh University, Mohali, Punjab, India;
E-mail: afiashabi11@gmail.com

(Ngozi Samuel Uzougbo *et al.*, 2024). The digital economy has made it imperative for the banking and finance domain to address concerns related to cybersecurity and ethical aspects of its market space, so that trust, security, and operational risk are ensured. Cybersecurity has emerged as a paramount concern spurred on by the increasing reliance on digital technologies and the sophistication of cyber threats (Asmar & Tuqan, 2024). Banks and other financial enterprises are rapidly adopting advanced technology, including Blockchain, AI & Cloud computing, and thus also facing heightened risk of Cyber-attacks, ransomware, and data breaches. These risks not only hamper the confidentiality of critical financial information but also create difficult ethical questions (Daengsi *et al.*, 2022). Nowadays, a fundamental ethical issue is maintaining a balance between employing technology to improve operational efficiency and safeguarding client privacy, the reliability of data, and trust. Furthermore, financial institutions need to manage stakeholder expectations, compliance requirements, and general social consequences of their cybersecurity procedures (Hasnan *et al.*, 2023). As developments in technology pick up momentum, tackling both the technical and ethical challenges is essential for the sustainable stability and trustworthiness of financial institutions (Kay *et al.*, 2021). In 2024, the market for cybersecurity has maintained its swift growth. Indian banks confirmed 248 effective data breaches by criminals and hackers from June 2018 – March 2022; the government informed Parliament on August 2, 2022. In 2022, the Indian government reported 11,60,000 cyberattacks. In 2019, three times as much is anticipated. In 2016, serious cyberattacks targeted India; a phishing attempt against the “Union Bank of India” almost led to a \$171 million fake transaction. The growing popularity of cloud-based services, mobile banking, and online transactions has increased the surface area for attacks, making confidential financial data vulnerable to ransomware, phishing, and hacking (Kay *et al.*, 2021). These cyber incidents pose a risk of serious consequences, including financial losses, reputational damage, and sanctions from authorities. Therefore, in order to effectively manage online risks, organizations must prioritize protecting customer data through strong cybersecurity measures, regulatory compliance, and cultivating a culture of awareness. In an increasingly interconnected world, this approach not only builds customer trust and corporate resilience but also ensures the security of sensitive data (Daengsi *et al.*, 2022). The process of defending systems, networks, and data from online threats, illegal access, theft, destruction, and interruption is known as cybersecurity. The main aim of cybersecurity is to safeguard against various kinds of cyber threats, including malware, phishing, ransomware, trojans, and other cyber threats that target vulnerabilities in online activities (Grady & Parisi, 2006). Cybersecurity in the banking sector, includes the strategies and tools used by financial institutions to safeguard against unauthorized access, data breaches, and cyberattacks (Dupont, 2019). Ethical

principles are integral to the development and implementation of cybersecurity practices because security, privacy, and trust are directly influenced by these practices in the digital environment. That is why it is said that cybersecurity is not merely a technical challenge but also an ethical one, mandating organisations to safeguard the rights of individuals online, protect sensitive information, and prevent threatening behaviour (Hasnan *et al.*, 2023).

With the rapid digital transformation, banks and other financial institutions are under pressure to address cybersecurity risks. Along with the operational integrity, these risks endanger the trust of customers, stakeholders, and regulators (Grady & Parisi, 2006). Cyberattacks are becoming more sophisticated, making banks and other financial institutions more susceptible to data breaches, disruptions to essential services, and financial fraud. Strong and sophisticated cybersecurity solutions are required due to the severe threats that such attacks pose to an individual's privacy and financial stability (Chesti *et al.*, 2020). But implementing such measures or solutions also raises ethical questions, including: How to strike a balance between individuals' privacy and security; How to be transparent in the event of a data breach; and How to distribute cybersecurity resources fairly across various financial institutions? (Agu *et al.*, 2024). To make the scenario even more complicated, ethical issues are arising over the use of artificial intelligence and data analytics in the financial services sector. It is where an ethically sound and comprehensive approach to cybersecurity is required in order to ensure the integrity of financial systems and protect the rights of specific individuals. The security of the financial institution is critically a central factor; the only solution will require a multidisciplinary method that incorporates legal frameworks, ethical governance, and innovation in technology in order to protect the financial institutions from continuously growing multifaceted cyber-attacks (Ngozi Samuel Uzougbo *et al.*, 2024).

A robust cybersecurity culture means that all employees, from the top of the organisation to the ground level, know the importance of safeguarding digital assets and also have the knowledge and skills needed to keep away from the challenges of cybersecurity. While establishing robust cybersecurity measures and adhering to legal requirements within the organisation that emphasize fairness, privacy, and equal treatment of all clients, banks and other financial institutions have to deal with these challenges pertaining to cybersecurity (Dupont, 2019). In essence, an important issue in explaining the future of financial institutions is the stability of safeguarding digital assets and sustaining ethical principles. To preserve the security and reliability of the financial system, an extensive strategy is necessary to address the complex relationship between cybersecurity and ethical considerations in banking and finance (Asmar & Tuqan, 2024). The risks related to cyber threats, data breaches, and fraud become more important as the

CHAPTER 5

Application of Artificial Intelligence in Financial Frauds Detection: A Bibliometric Analysis

Gurmeet Singh^{1,*}, Deepak Sood¹, Surinder Kaur², Simanpreet Kaur³ and Anjali³

¹ Chitkara Business School, Chitkara University, Rajpura, Punjab, India

² Department of Commerce, Post Graduate Government College, Chandigarh, Punjab, India

³ Department of Commerce, Chandigarh School of Business, Chandigarh Group of Colleges, Mohali, Punjab, India

Abstract: Financial frauds are rising and becoming very common in this modern technology-driven era. Specifically, financial frauds are the type of fraud that can be committed by just sitting at a remote location and clicking some buttons on a laptop or by setting an algorithm. Hence, the detection and prevention of financial fraud becomes a big challenge for the banking industry. In order to detect and deal with these frauds, artificial intelligence is playing an important role by providing advanced technologies such as machine learning. The present study attempts to map the knowledge structure in the domain of artificial intelligence and its application for financial fraud detection. For this purpose, the data is obtained from a widely used Scopus database, and bibliometric analysis is applied using VOSviewer Software. The present study analysed 63 articles published from 2015 to October 2024. The findings of the study reveal that after 2019, sharp growth has been seen in studies related to exploring the role of artificial intelligence in detecting financial fraud. The continent of Asia majorly contributed to the literature in the domain of applying artificial intelligence in detecting financial frauds followed by the continents of Europe and America.

Keywords: Anomaly detection, Artificial intelligence, Bibliometric analysis, Big data analytics, Blockchain technology, Credit card fraud, Data mining, Deep learning, Feature engineering, Financial crimes.

INTRODUCTION

Artificial intelligence has emerged as a vital reality of modern days, which has changed the business landscape through positive disruption because of technological innovations. The financial sector has also been affected by artificial

* Corresponding author Gurmeet Singh: Chitkara Business School, Chitkara University, Rajpura, Punjab, India; E-mail: gurmeet.s@chitkara.edu.in

intelligence because of these technological advancements, which result in a more dynamic banking sector. In the context of financial services or the banking sector, financial fraud detection becomes a persistent challenge (Dugauquier *et al.*, 2023). The severity of financial fraud not only affects the stability of the financial system but also brings considerable risks (Afjal & Dana, 2023). The significant increase in fraudulent activities in the past raises questions about the traditional methods used to detect fraud and demands for more improved and technologically backed mechanisms for the detection of financial fraud (Bao *et al.*, 2022). The process of fraud detection involves the detection of misleading activities that aim to manipulate monetary transactions in order to have illegal financial benefits (Ali *et al.*, 2022). It is very important to differentiate genuine transactions from fraudulent transactions, especially in the domain of banking and finance, where a large number of financial transactions are taken on a daily basis (Hilal *et al.*, 2022). Hence, financial fraud detection is the need of the hour in order to safeguard individuals, corporations, banks, and the overall financial sector from such kinds of fraudulent activities and to ensure the financial well-being of all these (Wali *et al.*, 2023). Fraud detection is the discipline which evolved over several years and witnessed the journey from rule-based manual methods to the application of more improved technologies because of the increasing complexities of financial fraud (Nicholls *et al.*, 2021). In earlier times, manual checks and some rule-based methods were used to identify financial frauds where transactions were checked manually, and any anomalies found were highlighted for further investigations (Zhu & Yang, 2019). These traditional systems of fraud detection become ineffective with time because of the change in the scale of the financial system and its increasing complexities (Pranto *et al.*, 2022). One of the major problems of these traditional methods was the dependence of these methods on preset rules, which only identify the known forms of financial fraud. Fraudsters, every time, adopt new strategies to deal with these preset patterns and find new ways of committing fraud (Taherdoost, 2021). A huge number of financial transactions happen in a financial system, which is another important challenge that shows the incapacity of these traditional methods to deal with the huge amount of real-time data (Chhabra & Prabhakaran, 2023). The ever-increasing complexity of financial frauds backed by improved technologies makes it compulsory to leverage the improved techniques and to move towards better and more advanced techniques that can be used to detect and prevent financial fraud (George, 2023). Improved technologies based on artificial intelligence, such as machine learning techniques, are based on self-learning algorithms that are capable of identifying anomalies and providing more adaptive solutions (Gautam, 2023). The introduction of artificial intelligence in detecting fraud results in the shifting of the fraud detection mechanism to advanced technology-based methods from the old manual system. The incorporation of advanced technology based on

artificial intelligence in fraud detection emerged because of the increased complexities, adaptabilities, and real-time responsiveness of financial fraud (Zhou *et al.*, 2020). Manual processes used for fraud detection suffered from some limitations, such as the possibility of human errors, and a more time-consuming and labour-intensive nature. The increase in the volume of financial transactions and their increasing complexities highlighted the demand for a fast and much more accurate system for financial fraud detection (Wang *et al.*, 2021; Zhou *et al.*, 2021). Artificial intelligence plays an important role in automating the analysis of transactions and the detection of anomalies with a greater level of precision. Various procedures using artificial intelligence algorithms are used to identify financial fraud. Supervised and unsupervised machine learning techniques are two more commonly used techniques under machine learning. Supervised learning and unsupervised learning are both used to detect unusual behaviours or fraudulent activities, but the major difference between the two is that supervised learning techniques work on labelled datasets, while unsupervised learning techniques work on datasets without labels (Carcillo *et al.*, 2021). Artificial neural networks under deep learning techniques have transformed the ways of detecting fraud because of their capacity to deal with complex and non-linear associations and identify unusual patterns indicating the possibility of fraud (Wei & Lee, 2024). Another important technique used to identify financial fraud is natural language processing, which identifies fraudulent activities by examining the descriptions of transactions or communication records (Shahbazi & Byun, 2021). These advanced techniques based on artificial intelligence provide a strong base to fight against financial crimes and help financial institutions stay ahead of fraudsters (Yeoh, 2019; Macas & Fuertes, 2024). Artificial intelligence shows notable contribution and effectiveness in the identification of fraudulent activities because of its advanced algorithms (Bouchama & Kamal, 2024; Ha *et al.*, 2020). The ability of artificial intelligence to learn automatically and its adaptability make it highly effective for detecting financial frauds for example, artificial intelligence-based algorithms used by credit card companies to detect fraudulent activities and prevention of unauthorised use of data (Abrahams *et al.*, 2023). In a nutshell, it can be said that artificial intelligence revolutionized the process of financial fraud detection because of its advanced algorithms and the ability of self-learning and adaptability (Abrahams *et al.*, 2023; Aziz & Andriansyah, 2023). Artificial intelligence and its introduction in the domain of financial fraud detection is a relatively new area of research. Hence, it is very important to explore the domain knowledge related to artificial intelligence and its application in financial fraud detection (Raza *et al.*, 2022). The present study performed a bibliometric analysis to map the domain knowledge and to understand the key developments in the domain of study (Van Eck & Waltman, 2014).

CHAPTER 6

Cybersecurity Risks in Online Banking: Comprehensive Analysis and Implementation of Protective Measures

Anju Rohilla¹, Priya Jindal^{2,*}, Sushma Sharma¹ and Shubhangi Tyagi¹

¹ Faculty of Management and Commerce, SRM University, Delhi-NCR, Sonapat, Haryana, India

² Chitkara Business School, Chitkara University, Rajpura, Punjab, India

Abstract: The complexity of cyber threats is rising in tandem with the digital transformation of the financial sector. This study aims to clarify the connection between the rise in cybercrime and the expanding usage of online banking. Understanding the current status of cybersecurity, assessing the efficacy of the current security framework, and suggesting strategies, policies, or modifications to the current policies are the goals of this study in order to increase digital security measures. The complexity of cyber threats, the financial consequences of breaches, and the efficacy of current security measures in the banking industry are all examined in this study. The latest developments in cybersecurity measures are also examined in the report. The study's findings demonstrate an urgent need for dynamic adaptive cybersecurity frameworks that integrate state-of-the-art technologies, facilitate regulatory compliance, and foster a culture of cybersecurity awareness. This terminology emphasizes a structured yet flexible system that can evolve, rather than a static plan. It conveys a more strategic and resilient approach to threat management. The paper concludes that the banking sector must adopt a comprehensive, adaptable cybersecurity policy, backed by strategic investments in technology, collaboration, and training. This study suggests combining artificial intelligence, big data analytics, and sophisticated predictive risk analytics and threat modeling to manage the quickly changing cyber security landscape. This involves not only identifying vulnerabilities but also continuously monitoring the threat landscape to predict potential attack vectors before they can be exploited. This chapter exhorts banking institutions to give cyber security resilience top priority in light of the ongoing financial transition, to protect both financial assets and customers.

Keywords: Artificial intelligence, Big data analytics, Cybersecurity, Digital transformation, Financial risk, Machine learning, Online banking.

* Corresponding author Priya Jindal: Chitkara Business School, Chitkara University, Rajpura, Punjab, India;
E-mail: priya.jindal@chitkara.edu.in

INTRODUCTION

Online banking is a result of rapid improvements in information technology, and it has a significant impact on the banking business. After India's Digital India campaign, Venkataganesh & Chandrachud (2018) explain that it brings a revolution that focuses on digital platforms. India's transformation is part of a global trend towards digital banking. Online Banking not only transformed the banking industry but also reshaped the future of the entire financial system and redefined the customer's experience with the banking industry (Rohilla & Bansal, 2015). It shifted the physical branches of the banks to virtual banking, which provides 24X7 hours access to banking services with ease.

The technological revolution is not only limited to online banking, but it has become more advanced with the digital revolution, which transforms the entire financial system (Murinde *et al.* 2022). The goal of the digital revolution is to reinvent banking and make it more customer-focused. For instance, a neo bank offers mobile and online banking. Digital transformation for banks goes beyond technology. It integrates the use of artificial intelligence (AI), machine learning (ML), and blockchain technology in the financial sector, which not only streamlines banking operations but also makes them efficient, safe, and effective. Leveraging predictive analytics and Artificial Intelligence, the underwriting process for credit applications is now automated, and individual credit card expenditure is forecast. This enables banks to dynamically tailor financial products, thereby optimizing approval rates, mitigating default risk, and enhancing customer satisfaction through personalized offerings. Fortunately, integrating new technologies in the banking sector will bring many future prospects, but it is full of challenges. One of the most significant challenges is cybersecurity. It has been reported in various studies that there is a profound increase in the number of cybercrimes. Cybercrime is one of the most significant threats perpetrated by sophisticated criminals, faced by many corporations (Rohilla & Bansal, 2018). Unauthorized access to sensitive information belonging to an individual or a corporation for the purpose of obtaining personal advantage is a type of criminal activity that occurs online. The occurrence of cybercrime occurs whenever there is a computer link to cyberspace, which includes both cyberspace itself and additional information and communication mechanisms (Walden, 2007). According to the 2016 PwC report, cyber breaches involve the use of inventive communication and fact-finding methods, particularly those that require considerable forensic and exploratory capabilities and are carried out with agility and precision (PwC, 2016). This chapter contributes to the development of the academic knowledge of cybersecurity and the risks associated with it.

CYBERCRIME

Because of the highly interconnected corporate ecosystem, cyber is the second most reported financial crime worldwide. Cybercrime is defined as any illegal behaviour that takes place in cyberspace and other information and communication channels (Dalla & Geeta, 2013). Financial services companies are 48 per cent more likely to become victims of economic crime, according to the conclusions of PwC's (2018) global report, which examined the global viewpoint of cybercrime. With a 700% economic crime rate, South Africa ranked second out of the top 15 nations with the least effective law enforcement systems for combating cybercrime. Internally fraud, cyber or online fraud, data theft, scams, pretending to be someone's identity theft, mortgage application fraud, statement of affairs fraud, or rogue trading, and merchant fraud are among the ten categories of fraud identified by the KPMG (2019) Global Banking Fraud Survey (KPMG, 2019). This includes falsification of documents and identity details.” Briefly explaining the mechanism of this specific fraud type adds depth and clarity for the reader. Furthermore, the survey confirms that just under 25% of the total damages resulting from cyber fraud were covered by more than half of the respondents from the three areas (America, EMA-Europe, the Arabian Peninsula and Africa, and Asia Pacific).

WHY CYBERSECURITY IS IMPORTANT IN THE FINANCIAL SECTOR

With the integration of new financial technologies into digital banking systems, the banking sector is poised to undergo further revolution. The way financial services are delivered is about to change due to new technologies, including the Internet of Things (IoT), fifth-generation wireless (5G), and personalized banking experiences. Banking will become safer, more customer-focused, and more efficient as a result of these developments (Rohilla & Jindal, 2024). It is critical that banks adapt to the constantly changing needs and expectations of their customers by adopting new strategies and technology in light of the ongoing evolution of the digital banking ecosystem. Nevertheless, integrating technological innovation is not without its challenges. Cyber threats are among the most important issues arising from the advancement of technology. The frequency, sophistication, and extent of cyberattacks on financial services businesses have increased dramatically—for example, the 2021 hack was 125% higher than 2020. Between Q2 and Q3 of 2022, data breaches in China, Japan, and South Korea increased at a knife-like rate of 4852%, 1423%, and 1007%, respectively (Griffith, 2024).

CHAPTER 7

Green Banking: From Concept to Reality for a Sustainable Planet

Suruchi Sharma^{1,*}, Priyanka Gupta² and Bindhia Joji³

¹ School of Management, Graphic Era Hill University, Dehradun, Uttarakhand, India

² Department of Management Studies, Graphic Era (Deemed to be) University, Dehradun, Uttarakhand, India

³ School of Business and Management, Christ University, Bengaluru, India

Abstract: A key approach to aligning financial development with environmental conservation is through adoption of green banking. Green banking is an emerging paradigm in the banking sector, focusing on promoting low-carbon and sustainable banking activities and services. This concept helps put together principles of sustainable development, which try to minimize the carbon footprint and ecological effects of banking activities. Green banking includes several initiatives, including facilitating green loans for eco-friendly projects, investing in renewable energy, and promoting digital banking to reduce paper consumption. That includes both the adoption of green policies at financial institutions, like energy-efficient buildings and waste diversion programs. Becoming a green bank means making substantial shifts in operational tactics, customer engagement methods, and regulation adherence. Financial institutions are key enablers of a green economy, as they direct investible resources towards sustainable projects. Banks can help themselves become financially sound in long-term simultaneously helping the earth by implementing such practices. Reserve Bank of India initiated the concept of green banking in India in 2013. This research study explores the journey of green banking from an idea to reality, analysing its different components, challenges faced and available opportunities. We discuss how the green finance concept can contribute to expanding the essential practices of modern banks, which benefit from the integration of risk management regarding sustainable investments and lending. It investigates the role of directive and control guidelines, technology-led advancements, and consumer behavior in driving the transition towards a greener financial sector. This chapter explores the various facets of green banking, from its conceptual framework to practical applications, highlighting successful case studies and the challenges faced in its implementation. It underscores the importance of a collaborative approach involving regulators, financial institutions, and customers to achieve a sustainable planet. Through this comprehensive analysis, the chapter aims to provide insights into the transformative potential of clean and green banking, along with its crucial role in promoting sustainable development.

* Corresponding author Suruchi Sharma: School of Management, Graphic Era Hill University, Dehradun, Uttarakhand, India; E-mail: suruchisharma210876@gmail.com

Keywords: Environmental finance, Eco-friendly policies, Green banking, Green lending, Sustainable development, Sustainable investments.

BACKGROUND

Chasing the cherished trinity of economic growth, financial progression, and profit maximization has inadvertently endangered our planet Earth, the mainstay of human existence. The thoughtless exploitation of natural resources and neglecting pollution control methods have already damaged the planet in many ways. The dangerous greenhouse gas emissions sourced from the excessive use of fossil fuels have invoked serious concerns across the stakeholder spectrum. It has necessitated a massive cutdown on GHG emissions in all areas to wrestle with the dangers looming large on human existence. It has been observed that approximately 80 per cent of the toxic exodus is sourced from means of transport, generating energy for myriad uses, and industry fuelling economic development. The balance is credited to activities related to cultivation, forestry, and others. The pressing need to regulate climatic change through viable strategic investiture is clearly evidenced and documented. The earth is expected to get warm by 3 to 5 degrees Celsius by the turn of this century, as per the shocking reports of 'Intergovernmental Panel on Climate Change (IPCC)', subject to the persistent environmental abuse at the current level. Huge loss of life and property is inevitable if this situation is left unresolved. At the organizational level, businesses need to sharply reduce their contribution to greenhouse gas emissions. The resources for such damaging activities are normally contributed by the large banks. Taking care of the environmental implications of economic activities is the only sustainable solution to development. The growth in international exchange of environmentally friendly goods and services would be rendered insufficient if such activities are not backed by appropriate financial support (Akomea-Frimpong *et al.*, 2022). This pivotal need has brought the financial community together to foster collaboration in such ventures. Their way of doing business is now changing, because if the source of business operations demands sustainability, the organizations will have to agree to curb the damage to planet Earth. The umbrella term for such environmentally conscious and credible activities undertaken by the banking and financial organizations is called 'Green Finance'. The well-known Triodos Bank conceptualized 'Green Banking' in the year 1980, which established a 'Green Fund' to support its environmentally friendly initiatives. It acted as a framework for the banks' thinking of adopting green banking strategies.

INTRODUCTION

According to the G20 Green Finance Study Group (Berensmann *et al.*, 2017), green finance is funding of projects having positive effects on the environment within the framework of developmental guidelines steered by sustainability. The term Green Banking forms a specialized dimension within the umbrella concept of Green Finance.

According to Bertram *et al.*, (2020), the banking practices focused on providing environmentally friendly products and services as well as the prevention of climatic damage and environmental protection. There are two aspects of green banking: the first is the way the banking industry operates, including whether or not it is paperless, and the second is how the bank allocates its funds. Unrestrained proliferation and upgrade of systems to make life easy for human beings have actually taken a severe toll on the climate and ecosystem.

The timer is ticking towards grave consequences if the climate crisis is not dealt with strongly at the earliest. Development can be sustained only in the light of climatic regulation. The environmental wrath can result in myriad problems for human life and sustenance. It can lead to acute shortfalls in water and food supply, annihilation of critical species, and severe damage to the weather.

Sustainable growth now depends on climate action. According to the Swiss Re Institute, inaction could cause global GDP to decline by as much as 18% over the next 30 years. The concepts of ‘Sustainable Finance’ and principles highlighting the ‘Environmental, Social, and Governance (ESG)’ are at the core of decision-making, and many large global players in the banking and finance sector, like JP Morgan, Bank of America, *etc.*, have dedicated multi-trillions of dollars as investments in projects related to clean-green energy and sustainability. Many major organizations worldwide have already committed to significantly reducing their emissions and achieving net zero by 2050.

A substantial investment corpus of approximately \$125 trillion is deemed necessary to achieve the herculean task of a net-zero transition by 2050. The destination is far away, but the stimulus is visible in positive actions, like in 2021, when \$755 billion was spent on clean and green technologies, 27% more than the previous year (Boehm & Schumer, 2023). The financial sector is becoming increasingly aware of its pivotal role in supporting the shift towards a sustainable economy. Net-zero banking, which seeks to integrate financial services with social and environmental sustainability objectives, is thus becoming increasingly important to the global efforts towards tackling climate change.

CHAPTER 8

Reshaping Portfolio Management: The Role of Technology in Modern Asset Management

Priya Jindal¹, Manpratik Singh¹ and Monica Gupta^{1,*}

¹ Chitkara Business School, Chitkara University, Rajpura, Punjab, India

Abstract: Specifically, the study focuses on improving investment portfolio management practices. It explores how technology is radically changing the way asset management firms operate. The research highlights the crucial role that technological advancements play in driving industry transformation by highlighting the importance of leveraging improved data and analytics capabilities, driving automation in key processes, improving decision-making protocols, and customizing services to meet the needs of individual clients. This study explores how technology is fundamentally changing the world of investment management. It shows that tools like data analytics and artificial intelligence are not just minor upgrades but are revolutionizing how firms operate. By using better data, automating routine tasks, and improving decision-making, asset managers can now offer more personalized and efficient services. This research concludes that embracing these technologies is no longer optional; it is essential for firms to stay competitive, manage risk effectively, and achieve long-term growth in a rapidly evolving market. Also, this study has used an exploratory design as it assists in framing the investigation stage, which can help collect necessary information. Findings: The fascinating results clearly show that the adoption of technological innovations is driving a paradigm shift in traditional investment management, opening the door to an operational environment within asset management organizations that is more informative and adaptable. The research reveals that asset management companies can gain significant insights from it as it examines the technological advancements that have led to the progressive evolution of the investment management field. Organizations may maximize the benefits of recent technological developments, streamline processes, and improve customer service tactics to create long-term growth and a competitive edge in the dynamic asset management market by following the advice provided in this chapter.

Keywords: Artificial intelligence, Asset management, Asset management firms, Automation, Blockchain technology, Cost efficiency, Data analytics, Data-driven, Dependent variable, Digital transformation, Efficiency, Financial services, Independent variable.

* Corresponding author Monica Gupta: Chitkara Business School, Chitkara University, Rajpura, Punjab, India; E-mail: monica.gupta@chitkara.edu.in

INTRODUCTION

Portfolio management is the art and science of making decisions about investment mix and policy, matching investments to objectives, and allocating assets for individuals and institutions. Traditionally, this process relied heavily on the experience and gut feeling of financial experts, who used historical data and manual analysis, often through spreadsheets. While valuable, this approach can be slow and prone to human error, especially in today's fast-paced markets. The practice is fundamentally based on the analysis of existing industrial data such as financial statements, economic indicators, and industry averages. It serves a critical function in the asset management industry by optimising investment performance, diversification, and portfolio alignment with current market conditions and client objectives (Iouliauou *et al.* 2021). Human expertise is considered the core of the operation, where portfolio managers rely on experience and intuition to evaluate. Manual processes that are common for decision-making, spreadsheets, and traditional valuation models can delay portfolio changes, leading to human-generated errors.

The asset management industry has experienced a notable evolution in recent years, attributed to the rapid progression of technological advancements. This evolution has not only impacted how portfolio management strategies are formulated and executed within asset management firms but has fundamentally reshaped traditional approaches (Gunjan & Bhattacharyya, 2023). Driven by rapid technological progress, the asset management industry is now undergoing a profound transformation. This shift is moving the industry away from intuition-based methods toward strategies driven by real-time data, which are far more efficient. Factors like globalization and market volatility have created an urgent need for this change. Technology provides the solution, enabling firms to process vast amounts of information instantly and respond to market movements with speed and precision. Consequently, these technological advancements are paving the way for the development and implementation of more efficient, data-driven, and tailored strategies in the market. This profound shift underscores the transformative role of technology in revolutionizing the asset management landscape, compelling businesses to continually innovate and adapt to remain relevant in an increasingly competitive, technology-driven, and swiftly evolving environment.

Globalisation, market volatility, and limited volume of data have contributed to the increasing complexity of financial markets, with an urgent need for actions towards data-driven decision-making in organisational portfolio management practices (Ikevuje, *et al.* 2024). The traditional approach faces challenges regarding the analysis of real-time information, which determines the necessity of

technology to capture competitive benefits. In this regard, high-frequency trading should be utilised, as its algorithms help execute trades in milliseconds and take advantage of market inefficiencies. The use of robotics advisors has also helped provide customised, automated investments, allowing individuals to develop strategies at lower cost but with greater accuracy (Kaur *et al.* 2024). Algorithmic strategies optimise artificial intelligence and machine learning to identify and model patterns, optimise asset allocation, and reduce risks. These innovations enhance efficiency, accuracy, and responsiveness, making technology adoption vital for contemporary asset management companies.

Asset management firms depend on fundamental analytical tools and human skills for portfolio management. The rise of advanced technologies such as machine learning, artificial intelligence, blockchain, algorithm trading, and big data analytics has brought an advanced era of obstacles and opportunities (Gavrikova *et al.* 2020). Based on these identified advancements, it is important to analyse the way technology is impacting the strategies of portfolio management within asset management organisations. The incorporation of technology and finance, commonly termed fintech, has expanded the path for transformation in the financial organisation, with firms supervising asset inheritances being the front line of innovation (Li *et al.* 2019). Presently, investment firms use natural language processing to analyze thousands of news articles and social media posts, turning this unstructured data into a trading signal. This transformation advances operational efficiency and permits asset managers to provide the best outcomes to clients within a competitive environment (Khalatur *et al.* 2022). Therefore, in relation to this critical transformation, asset managers should strike a balance between responsibility and innovation to ensure that technological advances are utilised transparently and ethically for the benefit of their clients.

The optimal enhancement of technology and innovation has prominently transformed asset management practices in firms through strengthening portfolio management activities. According to the report from KPMG, 67% of the technology leaders reported feeling pressure to improve their practices in 2023 compared to 2022 (KPMG. 2024). Asset managers now use AI to analyze alternative data—such as satellite images of retail parking lots or global shipping traffic—to identify investment opportunities before they are reflected in traditional financial reports. Moreover, the evolution towards technology-enabled solutions has allowed businesses to improve their decision-making practices while enhancing their operational effectiveness and providing customised investment tactics.

CHAPTER 9

Green Cryptocurrency: Challenges and Future Outlook

Maninder Kaur^{1,*} and Navgeet Singh²

¹ Chandigarh Group of Colleges (CGC) Landran, Mohali, Punjab, India

² Department of Good Governance and Information Technology (DGGIT), Mohali, Punjab, India

Abstract: Cryptocurrencies that employ energy from renewable sources for mining are known as “green” currencies. Green cryptocurrencies have significance because they could potentially aid in reducing or slowing global warming, whereas carbon dioxide (CO₂) emissions are the primary driver of global warming. Hive Blockchain Technologies began operations in 2022 and was the first 100% cryptocurrency mining company that prioritized renewable energy optimization. A few examples of environmentally friendly cryptocurrencies are Hive Blockchain technologies, Chia (XCH), Nano (NANO), Stellar Lumens (XLM), Algorand (ALGO), IOTA (MIOTA), Powerledger (POWR), Tezos (XTZ), Avalanche (AVAX), and Cardano (ADA). The benefits of Green Cryptocurrency include environmental sustainability, energy efficiency, positive social impact, investor appeal, and technological innovation.

Keywords: ASIC (Application-specific integrated circuit), Cryptocurrency mining, CPU (Central Processing Unit), FPGA (Field-Programmable Gate Array), GPU (Graphics Processing Unit), Green cryptocurrency, Hash rate, Proof of work, Proof of stake, Sustainability.

INTRODUCTION

The fight against global warming, changes in the climate, rising temperatures, overexploitation of our natural resources, *etc.*, are some of the major challenges our species, especially humans, will face in the 21st century. All individuals may contribute to a carbon-free society by making efforts for technological advancement, economic electrification, and the adoption of renewable energy sources. Cryptocurrency has proved to be a revolutionary technology in today's financial world, whereas Bitcoin has come up with many other downsides, such as immense use of electricity and huge carbon emissions. The Bitcoin mining

* Corresponding author **Maninder Kaur:** Chandigarh Group of Colleges (CGC) Landran, Mohali, Punjab, India; E-mail: maninderkaur102102102@gmail.com

process employs 127 terawatt-hours (TWh) of electricity annually, and it uses a proof-of-work (PoW) mechanism, where miners use huge amounts of electricity and powerful hardware to defeat and complete their competitions and solve complex mathematical problems (Alzoubi & Mishra, 2023). Cryptocurrencies that employ renewable sources of energy for their mining processes are called “green” cryptocurrencies. Bitcoin mining processes sometimes utilize renewable energy resources, which include energy derived from wind power, solar, and hydroelectric power (Ali *et al.*, 2024). Regions such as Quebec and Iceland have become hotspots for mining because of the availability of huge renewable resources. Renewable energy sources include things like hydroelectric, solar, and wind power. Green cryptocurrencies are significant because they could help reduce or slow global warming, while carbon dioxide (CO₂) emissions are the primary driver of global warming. A few examples of environmentally friendly cryptocurrencies include Hive Blockchain Technologies, Green Data Chain, Chia (XCH), Nano (NANO), Stellar Lumens (XLM), Algorand (ALGO), and Cardano (ADA). The study concludes that politicians and environmentalists should work to reduce carbon emissions by utilizing technologies that are energy-efficient. Worries about mining and the widespread use of technology in cryptocurrency trading have been pointed out by supporters of the environment, particularly those who specialize in climate change (BBC News, 2021).

Hive Blockchain Technologies began operations in 2022 and was the first 100% cryptocurrency mining company that prioritized renewable energy optimization. As a result, they have lower energy costs, lower temperatures, and faster internet access.

GREEN CRYPTOCURRENCY

Cryptocurrency offers many financial advantages; nevertheless, it is also criticized for its excessive use of energy, severe environmental consequences, and a significant amount of carbon emissions. According to the claim for an environmentally friendly future, the extraction process for cryptocurrencies requires a significant quantity of electricity, which has adverse environmental effects (Bendiksen & Gibbons, 2019). The green cryptocurrency was developed to address concerns such as high energy consumption, severe environmental consequences, and a massive carbon footprint. Green cryptocurrencies are those that are mined using renewable sources of energy, which include wind power, solar power, and hydroelectric power. As per the analysis of Crypto Carbon Ratings Institute (CCRI), Polkadot is the most carbon-efficient crypto asset with lower carbon emissions than other crypto assets like Cardano, Tezos, Avalanche, Solana, and Algorand, which are also eco-friendly crypto assets. The major problem with Bitcoin, Ethereum, and other cryptocurrencies is the absence of

green or environmental credentials. Cryptocurrencies like Cardano, Stellar, and Tezos are proven and widely acknowledged as having a lower environmental footprint compared to other cryptocurrencies.

Recently, with the advent of cryptocurrencies, the financial system has been altered by providing decentralized, secure, and transparent financial systems. However, this technological progress has some environmental disadvantages, which is a drawback. Traditional cryptocurrencies, in particular Bitcoin, have been scrutinised because of their high requirements of energy needed for the process of mining and, consequently, emissions of high amounts of carbon and strain on energy resources. To address these concerns, a new generation of digital currencies known as “green cryptocurrencies” has emerged, putting sustainability at the forefront and driving the development of sustainable blockchain solutions (Bruno *et al.*, 2023).

There has been a progressive use of sustainability as an important indicator for the future prospects of the blockchain industry. Most of the popular cryptocurrencies, including Bitcoin and Ethereum, are produced through mining. The mining processes of Cryptocurrencies require a considerably high amount of energy because of their complex computing needs. Green cryptocurrency has less environmental impact and was created to reduce carbon dioxide emissions, making it a better alternative to traditional cryptocurrency.

Green cryptocurrency's emergence is a movement on a global level towards sustainable finance and socially responsible technological innovation and development. They understand the need to act in response to the environmental impacts of cryptocurrency mining and seek to use eco-friendly mechanisms to reduce carbon emissions and improve energy efficiency. Thus, green cryptocurrencies not only help make the blockchain industry sustainable but also provide a platform for contributing to a greener future.

The global green cryptocurrency market is expected to grow at a 14.5% compound annual growth rate between 2023 and 2030, driven by growing environmental awareness among investors (Cambridge Centre for Alternative Finance, 2024). Also, the transition towards renewable energy-based cryptocurrency mining has led to the rise and growth of green energy jobs. The global renewable energy industry, fuelled in part by green cryptocurrency efforts, accounted for more than 12 million jobs in 2023 alone (Cambridge Centre for Alternative Finance, 2024). Unlike conventional cryptocurrencies, green cryptocurrencies adopt different methods to achieve their sustainability goals. Among the main differences is the use of energy-conserving consensus protocols. Opposite to the proof-of-work (PoW) consensus mechanism, which is employed

CHAPTER 10

Banking Reimagined: Unveiling the Impact of Disruptive Technologies on Financial Services

Chandani Sharma^{1,*} and Danish Ather²

¹ Department of CSE, MMICTBM (MCA), Maharishi Markandeshwar (Deemed to be University), Ambala, Haryana, India

² Department of Artificial Intelligence, Tashkent University of Information Technologies, Tashkent, Uzbekistan

Abstract: Innovative solutions in banking and financial services are being developed with the help of new technologies and have transformed the industry by increasing efficiency and customer experience. The industry is also impacted by some disruptive technologies like Artificial Intelligence (AI) and Machine Learning (ML), Blockchain Technology, Fintech Innovations, Digital Banking, Cryptocurrency, Open Banking, Cyber Security, RegTech (Regulatory Technology), Internet of Things (IoT), Cloud Computing, 5G Technology, Augmented Reality (AR) and Virtual Reality (VR), Biometrics, Virtual Events anduras.Webinars *etc.* Such technologies are radically transforming how financial services, and more specifically banking, are provided. They can be applied to ensure better efficiency, security, and better customer experiences.. This paper explores the paradigm of these technologies in the context of the need for financial services, their improvements, and the enhancement of banking operations. We will be exploring AI-facilitated collaboration and reward-driven investment, decision-making, secure warehousing, and blockchain, as well as the challenges of blockchain.

Keywords: Artificial intelligence (AI), Blockchain technology, Cloud computing, Digital bankingCrypto currency, Fintech innovations, Internet of things (IoT), Machine learning (ML), Open bankingcyber security regTech (Regulatory Technology), 5G technology.

INTRODUCTION

Disruptive technology is a term used for innovations that enhance or create entirely new technologies, business models, and industries. These technologies typically begin at a smaller scale, flourishing by offering solutions that are easier/cheaper/broader solutions compared to existing methods and have the potential to disrupt industries entirely (Pal, P. 2022). Disruptive technologies

* Corresponding author Chandani Sharma: Department of CSE, MMICTBM (MCA), Maharishi Markandeshwar (Deemed to be University), Ambala, Haryana, India; E-mail: chandani19nov@gmail.com

are gradually being integrated into the banking and financial services industry, improving the delivery of commercial services, driving innovation, enhancing operational efficiency, and improving customer experiences (Accenture, 2019). Artificial Intelligence (AI), Machine Learning (ML), Blockchain, Cloud Computing, FinTech innovations, and many other technologies are disrupting traditional banking models and providing new avenues of growth, personalization, and security (Sibanda *et al.*, 2020).

MAIN CHARACTERISTICS OF DISRUPTIVE TECHNOLOGY

The following are the main characteristics of disruptive technology:

Market Creation: Disruptive technology creates entirely new markets or transforms existing ones, offering products or services that were previously out of reach or cost-prohibitive to large numbers of consumers

First Move in Niche: Companies enter niche or underserved markets first with simpler or lower-cost products. They improve as they progress and ultimately cater to the needs of mass-market consumers.

Eureka: Disruptive technologies grow and change in leaps. New technologies can outperform old ones very quickly. They also offer other ways of satisfying – and possibly even exceeding – consumer needs.

Potential Disruption to Existing Leaders: Disruptive Technology can quickly wipe out the bottom end of the emerging technology adoption curve, but over time, it forces existing leaders to adapt or die.

A new generation of players in both embedded software and disruptions by artificial intelligence use large volumes of data and the ability to recognize patterns to rip off industry standards. Their evolution is changing at a high rate and hence, the problem occurred because of the adaptation of businesses and new technology engagement by the consumer. As beneficial as these technologies are in several respects, they are also arguably among the most pressing threats and issues we face, and we should be keenly aware of the broader social and economic effects of their implementation.

This chapter also explores how trend-setting technologies gradually reorganize the financial services eco-space by, among other things, improving efficiency, and providing better security and experiences to customers. It discusses certain innovative trends in financial services, such as AI, blockchain, fintech development, and cloud, and examines their effects in banking. And we will also

discuss a few risks of these technologies, including the complexity of blockchain and the security issues.

THE JOURNEY OF FINANCIAL SERVICES: TRADITIONAL TO DIGITAL

Financial services were born with a revolution. The financial services sector has undergone centuries of evolution as technological progress and emerging consumer behaviour drive the industry toward greater efficiency, convenience, and transparency. We take the key steps of this evolution along the way, including the tectonic changes that created the financial world as we see it today (John Wiley & Sons, 2019).

Traditional Banking Era

Banks were once physical and on the ground, and some services were available. The following were some of the distinguishing features of this era:

Branch Banking: Customers would have to go to a physical branch to carry out the majority of the banking functions. The working hours were restricted, and the services were provided in-person, which became a nuisance to the customers as well.

Small Product and Service Range: Traditional banks sold only saving accounts, checking accounts, loans, and mortgages; in fact, investment services or insurance are more likely to be sold by separate organizations.

Personal Relationships: Within the relationship-based banking sector, customers tend to deal with the bank in direct contact with the bank tellers and loan officers. Customers are more satisfied with relationships and trust.

The Rise of Technology: Automated Banking

When technology entered banking at the very end of the 20th century, it opened a wave of innovations in financial services:

Automated Teller Machines: The ATM idea was conceived during the 1960s, but they really took off during the 1980s when consumers could now get details of their cash and account balance anytime without necessarily having to enter the bank.

Telephone Banking: Telephone banking services were first introduced by the banks in the 1980s, and thus, the customers could now perform simple transactions over the phone, including checking balances and transfer funds.

CHAPTER 11

India's Progress in Adopting Digital Payments: A Study of Punjab

Baljinder Kaur¹ and Jaswinder Singh^{2,*}

¹ Chandigarh Business School of Administration, CGC Landran, Mohali, Punjab, India

² Department of Mechanical Engineering, Chitkara University Institute of Engineering and Technology, Chitkara University, Rajpura, Punjab, India

Abstract: Technological advancements have catalyzed a transformative digital revolution in India, reshaping the nation's economic landscape. This paradigm shift is notably evident in the strategic use of digital tools by Indian banking and payment systems, aimed at establishing a Faceless, Paperless, and Cashless economy. This chapter seeks to elucidate the vision of the Reserve Bank of India (RBI) and analyze the dynamics propelling the digitization of payments across the nation. With the objective, it outlines the trajectory of the digital revolution, offering insights into the impact of significant events such as demonetization and the far-reaching consequences of the COVID-19 pandemic. Additionally, it aims to provide a broad overview of the current state of digital payment methods. It also explores the relationship between the usage of digital payments and consumption-related attributes specific to users in Punjab. Furthermore, it establishes a foundation for future researchers in this evolving field.

Keywords: Digital revolution, Digital payment systems, Technological advancements, India.

INTRODUCTION

Journey of the Digital Revolution of the Indian Banking System

The banking sector in India began adopting new technologies in the 1980s, starting with the mechanization of cheque processing and progressing to the introduction of ATMs and computerization of banks in 1990 (Gupta, M., 2017).

The digital revolution of the Indian banking system was initiated in 1996, when ICICI Bank introduced internet banking. Thereafter, the digital landscape was

* **Corresponding author Jaswinder Singh:** Department of Mechanical Engineering, Chitkara University Institute of Engineering and Technology, Chitkara University, Rajpura, Punjab, India; E-mail: jaswindersingh@chitkara.edu.in

communication technologies, and mobile services. This resulted in faster acceptance of digital payment methods in India. This has changed the way the general public communicates, shops, studies, works, travels, and has also led to the design of many other useful devices for improved living (Seif F. Y., 2012).

RBI serves as a facilitator in the progression of digital payment methods. Payment systems in India are governed and monitored by the RBI under the Payment and Settlement Systems Act, 2007 (PSS Act, 2007). For the wide-ranging, safe, systematic, global, and legalized payment systems, the RBI has persistently been involved in establishing regulations under the Act.

UNDERSTANDING THE PAYMENT SYSTEM IN INDIA

The payment system is defined as a system that allows the execution of payments between a payer and a beneficiary, involving clearing, payment, or settlement services, or a combination of these, excluding stock exchanges under the PSS Act, 2007.

TYPES OF PAYMENT SYSTEMS IN INDIA

The Indian payment systems include three diverse types of payments (RBI, n.d.); caters to meet the varied needs of the general public nationwide as follows:

1. Paper-Based Payments
2. Digital Payments
3. Other Payment Systems

Paper-based Payments

It includes cheque and draft constituting approximately 60% and 11% of the total transactions' volume and value in the country (RBI, n.d.). With the RBI's continuous efforts to encourage electronic payments, there has been a gradual decline in the use of paper-based instruments in recent years (Venkatesvaran, 2017).

Digital Payment

The evolution of digital payments in India began in the mid-1980s, with the RBI actively embracing technological advancements. This transformed traditional payment and settlement systems into digital payments, laying the foundation for digital payments infrastructure (Gupta, 2017). Various digital payment instruments are described below (RBI, n.d.):

National Electronic Funds Transfer System (NEFT)

Introduced by the RBI in the late 1990s as Electronic Funds Transfer (EFT), NEFT enables users to transfer funds electronically between accounts in different banks. An enhanced version, available 24x7x365 with settlements every half an hour, was introduced in 2005 (RBI, n.d.).

National Automated Clearing House (NACH)

NACH oversees centralized Electronic Clearing Systems (ECS) in India, managing ECS (Credit) and ECS (Debit). ECS (Debit) facilitates routine payments by allowing utility customers to mandate their bank branches for automatic debits, reducing paper usage and enhancing efficiency (RBI, n.d.).

Point of Sale (POS)

POS terminals enable transactions through credit/debit cards, witnessing a significant 38.2% rise. Presently, there are over 50 lakh POS terminals in India. Online payments through POS involve accepting cards via online gateways, which can be third-party services or personal payment gateways (RBI, Jan. 2020).

Real-time Gross Settlement (RTGS) System

Launched in 2004, RTGS facilitates real-time, gross basis fund transfers for transactions exceeding 2 lakh, including all inter-bank payments in India (RBI, n.d.).

Other Payment Systems

This category includes Clearing Corporation of India Limited (CCIL), mobile banking services, Bharat Bill Payment System (BBPS), and Payment Aggregators (PAs)/Gateways (RBI, n.d.):

Clearing Corporation of India Limited (CCIL)

CCIL facilitates clearing and settlements of trades in the money market, government securities, and foreign exchange markets.

Mobile Banking

With technological advancements and the introduction of smartphones, mobile banking enables more efficient banking services (Shastri & Vaidya, 2019).

CHAPTER 12

Financial Fraud and Digital Crimes in the Era of Digital Disruptions: Challenges, Trends, and Cybersecurity Strategies

Vijay Prakash Gupta^{1*}, Divya Khatter² and Monika Bansal³

¹ *Institute of Business Management, GLA University, Mathura, Uttar Pradesh, India*

² *Department of Commerce, Dyal Singh College (M), University of Delhi, Delhi, India*

³ *Department of Management Studies, Deen Dayal Upadhyaya College, University of Delhi, Delhi, India*

Abstract: Digital crimes and financial frauds are more susceptible to financial ecosystems and more innovative due to the rapid development of digital technologies.

This chapter also examines the relationship between financial crimes, digital disruptions, and cybersecurity challenges. It explores the latest topics such as cybercrime, cryptocurrency scams, social engineering fraud, and fraudulent AI applications.

The other aspect that has been noticed in this chapter is that the possibility of financial crimes can be reduced with the assistance of legislation, technological advancement, and a cybercrime strategy. The chapter also details how cybersecurity strength can be enhanced using international best practices and emerging trends. The results provide strategic suggestions to financial institutions, businesses, and governments on how to improve fraud-prevention techniques as the world becomes increasingly digitally interconnected.

The other aim of this chapter was to formulate strategic recommendations for companies, financial institutions, and legislators on ways to enhance fraud prevention in a world that is increasingly digitalized.

Keywords: Banking, Cybersecurity, Digital crimes, Digital disruptions, Financial frauds.

* **Corresponding author Vijay Prakash Gupta:** Institute of Business Management, GLA University, Mathura, Uttar Pradesh, India; E-mail: vijayguptacmd2@gmail.com

INTRODUCTION

An Overview of Digital Crimes and Financial Frauds

Today, in a hyper-connected world, technological innovations have revolutionized the financial world, and financial scams and digital crimes are becoming commonplace. Financial fraud is defined as deceptive actions carried out with the intent to obtain an unfair financial advantage; most of these acts involve identity theft, embezzlement, or fraudulent transactions. On the other hand, digital crimes range from a greater number of crimes, including ransomware, phishing, hacking, and cyberattacks, exploit technological flaws to gain unlawful financial benefits. As financial services are increasingly digitized, old fraud techniques have evolved into highly sophisticated cyber-enabled financial crimes. Because internet banking, digital payments, and cryptocurrencies are being increasingly used widely, fraudsters have found new avenues to attack security holes. There are several problems that people, businesses, and governments face with financial transactions moving online. Frauds exploit security holes as people increasingly use internet banking, digital payments, and cryptocurrencies. The shift of financial transactions to digital platforms makes people, businesses, and governments increasingly vulnerable to cybercrimes. Hence, more preventive measures and regulatory actions are needed.

In this fast-paced global economy, financial fraud and cybercrimes threaten to affect people, businesses, and national governments in a new integrated technological world. Fraud AI is financial fraud in which one's own privileged access is used to defraud a victim. In contrast, digital crimes cover a wider range of cyber threats that involve exploiting technology for profit, such as ransomware, phishing, and hacking, as well as large-scale cyberattacks. With digital transformation, traditional types of fraud have transformed into more advanced cyber-enabled financial crimes, making it difficult to identify potential threats and mitigate them.

With Internet banking, digital payments, cryptocurrency, *etc.*, being widely used, fraudsters are finding new ways to exploit loopholes in these systems. Cyber criminals employ advanced tactics such as AI-powered phishing assaults, deepfake scams, and malware to invade financial networks. And without cybersecurity knowledge, users fall for the traps set by attackers. As such, governments and businesses must;

- a. introduce proactive cybersecurity measures,
- b. enforce better regulatory frameworks, and
- c. adopt next-gen fraud prevention technologies like blockchain security solutions, multi-factor authentication (MFA), and real-time transaction

monitoring.

The public needs basic digital literacy training programs to be implemented together with cybersecurity awareness-raising education. Automating money transfer systems has become an absolute necessity for the digitized crossroads of our financial transition, but what the system needs to ensure is the union of the power of technology and conscious awareness with the right laws to form a resilient and secure financial mesh.

Digital Disruptions and Financial Fraud

In the modern financial aspects, the manual ledger was the only means for businesses to keep track of their financials, as the emergence of contemporary technology, such as blockchain, cloud computing, artificial intelligence, and big data analytics, has given rise to cultures of digital disruptions that reshape financial operations and pave the way for infinite possibilities for economic growth. But those changes also introduced more risks and vulnerabilities that hackers are exploiting to commit fraud.

The increasing application of digital technologies to the provision of products and services in the financial services sector has resulted in complications of cyberattacks, unauthorized access to data, medicine, and fraudulent activities - robo-financial fraud schemes and financial identity fraud.

The use of digital wallets, mobile banking apps, and other FinTech solutions has made it easier to execute financial transactions (Yathiraju & Dash, 2023), but it also increases the chances of cyberattacks (Tariq, 2018). Whereas scammers use emerging technologies to perform Financial fraud (Karpoff, 2021)

It is increasingly easy to conduct financial transactions due to the widespread use of digital wallets, mobile banking applications, and financial technology solutions, but it is also prone to cyberattacks. Therefore, there is an even greater need for financial institutions and authorities to adopt state-of-the-art cybersecurity standards to counter fraudsters who use emerging technologies to circumvent traditional security measures.

CYBERSECURITY: A VALUABLE ASPECT IN THE DIGITAL AGE

Cybersecurity is a security system that protects the financial data of an individual against unauthorized access (Shields, 2015). In that way, it has been introduced as one of the crucial measures utilized to fight financial fraud and cybercrime. Most rigorous cybersecurity steps are reasonably relevant in the current era because cyberattacks are evolving on a daily basis.

SUBJECT INDEX

A

Advanced technologies 55, 57, 70, 71, 103,
106, 130, 135, 136, 137, 215, 221
providing 70
Artificial intelligence 70, 75, 77, 78, 80, 85
adoption of 75, 80
role of 70, 75, 77, 78, 85
Asset allocations 130, 134, 135, 138
better 134
optimise 130
tailored 134
Asset management companies 128, 130, 132,
134, 135, 136, 137, 139, 141
contemporary 130
enabling 134
Asset management organisations 130, 131,
137, 142
renowned 142
Asset managers 128, 130, 133, 138, 139,
140, 141, 142
authorizing 138
enabling 133, 139
responsible 140

B

Banking activities 172, 108
ethical 172
sustainable 108
Banking industry 60, 90, 91, 93, 94, 97, 100,
110, 111, 180, 183
data-intensive 60
Banking operations 91, 105, 115, 117, 167,
178
streamlines 91
transitioning core 178
Banking practices 65, 110, 114, 115, 171
ethical 65
implementing sustainable 115
traditional 171

Banking sector 61, 63, 71, 90, 91, 92, 94, 95,
108, 111, 115, 121, 122, 124, 169, 174,
177
dynamic 71
global 115
relationship-based 169
Banking services 1, 2, 7, 13, 91, 170, 174,
177, 182, 192, 193
basic electronic 193
digital 174
digital-first 177
Banking systems 6, 21, 62, 65, 92, 105, 120,
122, 182, 184
autonomous 184
digital 62, 65, 92
traditional 21
Biometric authentication features 223
convenient 223
secure 223
Bitcoin mining 145, 148, 152, 153, 155
incorporating 155
Blockchain industry 147, 157, 158, 159, 162
energy-efficient 157
Blockchain technology 29, 32, 66, 70, 155,
156, 159, 161, 167, 171, 173, 176, 223
responsible 159

C

Carbon emissions 115, 122, 145, 146, 147,
148, 151, 153, 155, 156
huge 145
lower 146
reducing 153
Carbon footprint 108, 112, 113, 114, 118, 125,
148, 153, 157, 160, 164
bank's 118
cryptocurrency's 160
high 153
Climate change 109, 110, 111, 114, 115, 117,
121, 125, 146, 155, 158
global 111

- mitigating 115
- mitigating global 158
- Compliance requirements 22, 55, 226
 - overlapping 22
 - strict 226
- Consumer data 23, 65, 222
 - protecting 65
 - sensitive 23
- Consumer interests 28, 29, 32, 33, 185
 - protecting 28, 33
 - safeguarding 22
 - upholding 185
- Cryptocurrency mining 145, 147, 148, 153, 156
 - renewable energy-based 147
- Customer data 55, 61, 106, 170, 171, 182
 - protecting 55, 106
- Customer satisfaction 3, 5, 7, 91, 94, 182
 - enhancing 91
 - improving 182
- Customer service 3, 4, 5, 17, 173, 177
 - improved 177
 - positive 4
 - responsive 3
- Customer trust 55, 56, 66, 93, 213, 214, 217, 218
 - expedite 218
- Cyber threats 90, 97, 216, 220
 - common 97, 216
 - complexity of 90
 - emerging 220
- Cybersecurity challenges 54, 56, 57, 58, 62, 65, 206
 - potential 54
- Cybersecurity frameworks 90, 216, 224
 - comprehensive 224
 - dynamic adaptive 90
 - institutional 216
- Cybersecurity measures 56, 90, 94, 103, 104, 105, 210, 215, 220
 - advanced 103
 - establishing robust 56
 - implementing 94, 104
- Cybersecurity policies 67, 90, 106, 217, 222, 225
 - robust 217
 - stringent 225
- Cybersecurity practice 56, 93, 224, 225
 - best 224
- Cybersecurity procedures 55, 57, 62, 63, 64

- ethical 63
- strong 62

D

- Data analysis 2, 9, 43
 - advanced real-time 134
- Data analytics 83, 90, 128, 130, 131, 139, 141, 171, 173, 208, 209, 222, 224
 - complex 222
 - improving 173
 - multifactorial 222
- Data collection 137, 138, 182, 196, 222
 - real-time 182
- Data protection 29, 31, 86, 178, 179, 224
 - efficient 178
 - ensuring robust 86
 - robust 31
- Data security 132, 181, 214
 - personal 181
- Digital assets 56, 99, 159, 176, 210, 216
 - global 99
 - safeguarding 56
- Digital economy 55, 164, 194, 210, 212, 216, 225, 226
 - fraud-free 225
- Digital payments 183, 187, 188, 190, 191, 193, 194, 195, 196, 197, 198, 202, 203, 207
 - diverse methods of 191
- Digital revolution 91, 187, 204, 209, 212
 - transformative 187
- Digital transformation 56, 65, 90, 91, 128, 179, 207
 - rapid 56
- Digital world 195, 216, 219, 225, 227
 - ever-changing 227
 - safer 219

E

- Emerging technologies 23, 85, 172, 174, 184, 185, 208, 209, 220, 225, 227
 - adoption of 172
- Energy consumption 113, 116, 146, 148, 150, 151, 152, 154, 156, 157, 163
 - annual 148, 151
 - high 146
 - highest annual 152

Subject Index

Energy efficiency 113, 115, 116, 122, 145, 147, 148, 154, 156, 157, 159
increasing 113
Energy sources 114, 116, 145, 146, 157, 159, 164
clean 114
renewable 145, 146, 155, 156, 157, 164
sustainable renewable 157, 159
Environmental impact 115, 147, 148, 154, 156, 160, 163
disastrous 160
positive 154
Ethical dilemmas 36, 37, 38, 39, 41, 43, 44, 45, 47, 48, 49, 50
common 36
complex 39
impact of 36, 47, 48, 49
Ethical factors 36, 45, 47, 49, 50
identified 50
Ethical principles 36, 48, 56
robust 48
sustaining 56

F

Financial crimes 70, 72, 73, 75, 76, 81, 82, 84, 206, 207, 210, 211, 225
advanced cyber-enabled 207

international 225
Financial data 54, 55, 208, 216, 219
confidential 54
making confidential 55
private 216
Financial ecosystems 156, 159, 185, 206, 218
equitable 159
hyper-personalized 185
inclusive 156
Financial inclusion 23, 31, 33, 82, 181, 183, 185, 193
better 31
Financial information 55, 59, 94, 102, 104, 138, 179, 218

critical 55
sensitive 104, 179
Financial institutions 61, 114, 175
dedicated 114
enabling 175
reputable 61

Reshaping Banking and Financial Services 231

Financial landscapes 15, 134, 141, 226
fast-evolving 134
safer 226
Financial literacy 2, 3, 6, 7, 15, 23, 33, 82
lack of 3, 23
Financial losses 55, 60, 61, 95, 212, 213, 215, 218
heavy 215
significant 60, 95
Financial markets 36, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50
ethical dilemmas in 36, 49, 50
sustainable 50
Financial planning 2, 15, 178
algorithmic 178
effective 15
Financial products 91, 182, 184, 121, 217
digital 217
friendly 121
individualized 181, 184
Financial stability 13, 22, 56, 66, 111, 184, 213
long-term 213
Financial transactions 71, 72, 93, 94, 103, 105, 176, 179, 180, 192, 207, 208, 218, 221, 222, 225
enabled preconditioned decentralized 176
illegal 218
interoperable 192
Financial world 38, 66, 145, 164, 169, 177, 207
inclusive 164
Fraud detection 66, 71, 72, 77, 81, 82, 85, 105, 171, 174, 175, 184, 185, 217, 221, 226
applications in financial 72, 77
real-time 226
revolutionized 105
Fraud prevention 65, 181, 182, 206, 222, 227
critical 65

G

GHG emissions 109, 115, 148, 149
historical 149
net-zero 115
Green cryptocurrencies 145, 146, 147, 148, 153, 154, 156, 157, 158, 159, 162, 163, 164
adoption of 163

sustainability of 148, 159, 163
Greenhouse gas emissions 109, 114
dangerous 109
net-zero 114

I

Investment decisions 113, 117, 131, 132, 134, 140, 141, 158
better 141
responsive 134
significant 140
Investment strategies 133, 138, 139, 140, 141, 177
forecasted 133
IoT devices 99, 182, 183, 215, 220
growing 220

L

Login credentials 60, 97, 105
critical 97
individual 105

M

Market conditions 129, 134, 136
expected 134
extreme 136
Mining processes 146, 147, 148, 150, 155, 156, 157, 176
energy-intensive 156
low-efficiency 148

N

New technologies 91, 132, 136, 141, 167, 168, 172, 174, 178, 180, 187, 220, 222, 223

O

Online platforms 2, 6, 15, 180, 212
favouring 2

P

Payment methods 27, 190, 191, 195, 198, 203
multiple 203
personal devices for digital 198

Payment systems 100, 170, 171, 187, 188, 189, 190, 193, 194, 197, 203, 214, 216
bank's 100
company's 214
digital 170, 187, 194, 197, 203
Phishing attacks 58, 59, 61, 65, 97, 98, 106, 210
whale 98
Portfolio management 129, 130, 131, 132, 133, 134, 136, 137, 138, 139, 140, 141, 142, 170
automated 170
automating 134
effectiveness of 133, 139
Portfolio performance 132, 133, 141
enhanced 133
maximize 141

R

Real-time data 71, 129, 133, 134, 135, 136, 139, 141, 175, 182, 222
better 136
enhanced 141
improved 139
Regulatory frameworks 31, 50, 179, 207, 215, 217
better 207
clear 31
effective 217
Risk assessment 6, 50, 81, 83, 117, 216, 217
environmental 117
ethical 50
informed 177
Risk management 133, 180, 226
active 226
enabling better 180
improved 133

S

Security controls 216, 220, 222
bypass 220
implementing 216
Security measures 90, 100, 170, 211, 217
digital 90
effective 217
increased 170
Security solutions 59, 62, 101, 103, 215
implementing 215

Subject Index

Security systems 65, 208, 209, 223, 225
 cutting-edge 65
 digital 223
 strong digital 225
Sensitive data 55, 58, 59, 60, 61, 65, 95, 102,
 178, 215, 216
 protecting 102
Smart contracts 83, 159, 161, 171, 176, 185
 blockchain-based 185

T

Technological innovations 21, 22, 29, 32, 92,
 128, 133, 137, 141, 145, 147, 156, 159,
 163, 164
 integrating 92
 new 21
 responsible 147

U

Unauthorized access 55, 58, 60, 61, 91, 94,
 95, 102, 208, 220
 persistent 95
 preventing 102

V

Variance inflation factor (VIF) 11, 12
Visual Analytics 83
Vulnerable clients 64

W

Wireless connections 195
World economy 125
World regulators 209

Reshaping Banking and Financial Services 233



Monica Gupta

Monica Gupta is an accomplished academician, researcher, and industry consultant with over 14 years of experience in banking, finance, and financial technologies. She is an Associate Professor at Chitkara Business School, Chitkara University, Punjab, India, where she leads teaching, research, and curriculum development in financial management, fintech, and risk analysis. Dr. Gupta specializes in fintech innovations, including blockchain, AI, and IoT applications in finance, with a focus on customer experience, fraud prevention, and cybersecurity. She has published over 15 research papers in national and international journals, including 13 SCOPUS-indexed publications, and co-authored the book "Reshaping Banking and Financial Services with Disruptive Technologies". Dr. Gupta actively collaborates with industry, conducts workshops on sustainability, and consults on government projects. She has supervised two Ph.D. scholars and has filed 10 patents. She is also a sought-after speaker at global conferences and a mentor to startups, guiding them on digital transformation strategies.



Priya Jindal

Priya Jindal is currently working as a Professor and Assistant Dean of Commerce at Chitkara Business School, Chitkara University, Punjab, India. She holds Master's degrees in Commerce and Economics. Her areas of interest include Banking, Finance, Insurance, and General Management. She had achieved distinction in her M.Phil. in 2009. She earned her Doctorate in Management in 2014 from Maharishi Markandeshwar University, Mullana, Haryana, India. She has contributed approximately 17 years to teaching. She has supervised five Ph.D. scholars and two M.Phil. candidates. Numerous research papers, book chapters, and conference papers (including IEEE) have been indexed in Scopus. She has presented her work at various national and international conferences. She has filed over 14 design patents and 12 utility patents. Two copyrights have been granted in her name. Dr. Jindal has an editor of six edited books under IGI Global, Nova Science, and CRC publications, all of which have been indexed in Scopus. She has also chaired many national and international conferences.



Piyush Gupta

Piyush Gupta is a faculty in the area of Operations Management. He has done Ph.D. from Indian Institute of Management (IIM) Ranchi and post-graduation in M.Tech from Indian Institute of Technology (IIT) Dhanbad in Industrial Engineering & Management. He has more than five years of teaching and research experience. He has published many high-quality papers in top journals such as Information Technology & People, International Journal of Retail & Distribution Management, International Journal of Productivity & Performance Management, to name a few. His area of research interests falls in service operations, behavioral operations research, process analysis and improvement. He has involved in doing interdisciplinary research. He is serving as the associate editor and guest editor in top tier journals.