PROJECT REPORT

Data Commodification in Banking

Project Contributors:

Name	ID
Riddhi Panchale	24035742
Muhammad Ghare	24035769
Dylan Rodrigues	24121479
Anurag Kalamkar	23179309

Module: Data Governance and Ethics

Module code: IN6062

Course: MSc Business Analytics

Lecturer: Prof. Martin Cunneen

Table of Contents

INTRODUCTION

The reports together take a multidimensional look at the promise and the peril of the twin forces of data commodification and artificial intelligence (AI) in the banking industry insights into the transformative opportunities and the profound ethical, regulatory, and governance challenges these disruptive technologies raise. Banking-as-a-service and AI-based personalized services enable data commodification for better competition plus customer experience, but at the same t ime, they carry privacy risks, cybersecurity threats, and algorithmic biases that users incur. Regulations like GDPR do provide some layers of protection, but they are not fast enough to keep up with the fast-paced developments, particularly around decentralized finance (DeFi) and AI applications. The reports underline the urgency of powerful data governance that is more than just compliance and includes ethical aspects such as algorithmic transparency, informed consent, and privacy by design. Moreover, the findings imply that a multi-level governance model whereby regulatory means are fused with corporate ethics, as well as cutting-edge solutions (e.g., RegTech) is required to mitigate the risks and ensure the compliance of AI models and data practices with societal and consumer protection norms. Finally, the reports underline that despite the substantial advantages such innovation brings in terms of financial inclusion and efficiency, they will need to be accompanied by active monitoring to make sure that they do not reduce equality or consumer trust.

RIDDHI'S REPORT ON

Fintech and the Democratization of Financial Services

Abstract

This report examines the contribution of fintech to the democratization of financial services by data commodification, open banking, and the application of AI technologies. Fintech can be both an enabler of economic access and better-aligned services to individual needs, but it also introduces ethical and governance challenges of a new and, at times, complicated nature. Using a multi-perspective lens, the report reviews data privacy, AI-based decision-making, and regulatory frameworks supporting fintech innovation. Based on a review of relevant academic literature and analysis of real-world examples of fintech evolution, the analysis illustrates the opportunities and challenges fintech evolution holds. This includes governance models across sectors, algorithmic transparency, and regulatory measures ahead of the curve.

Introduction

Background:

The emergence of FinTech has revolutionized the banking and financial services accessibility, particularly in developing and underserved markets (Asif et al., 2023). But, there may be no way out: the growth of fintech is inherently a growth in the commodification of personal data and an algorithmic service model.

Importance:

These innovations, however, risk reproducing extant structural inequalities and/or introducing new harms such as algorithmic bias and the commodification of personal data, drawing a strategic need for data governance and ethical oversight (Gabor and Brooks 2016).

Research Objective:

This report aims to examine how fintech is contributing to bringing more people into the financial system, while also presenting a variety of new ethical and governance challenges. In particular, it explores the risks posed by data-driven services, existing governance structures, and potential models for better oversight.

Structure:

The paper is organized as follows: key literature reviewed in Section 2; method outlined in Section 3; findings and case studies examined in Section 4; implications discussed in Section 5; and recommendations provided in Section 6.

Literature Review

Frameworks of Data governance:

Data usage in traditional banking worked within tightly monitored models. Fintech, on the other hand, uses APIs, Cloud computing, and third-party data ecosystems that decentralize accountability (Navaretti et al., 2018). PSD2 in the EU and Open Banking UK permit data sharing that goes together with liability vagueness.

Digital financial inclusion:

Entry barriers to financial services have lowered greatly with fintech. Asif et al. The effect it has on India's rural population using mobile banking and access to microcredit (2023). But those services often go around the usual protections.

Ethical Risks in AI:

Banking: AI applications in banking can improve fraud detection and underwriting, but they tend to be black boxes and reinforce social biases (Nawayseh, 2020). You may have heard about "Black box" algorithms, which make transparency problematic and governance more difficult.

Fintech Regulation Gaps:

Specifically, Gabor and Brooks (2016) argue that GDPR and PSD2 frameworks remain patchwork, reactive data protection mechanisms. The necessity of anticipatory governance is also growing to keep up with innovation.

Methodology

Qualitative Study- This research utilized a qualitative approach, which combined a desk-based literature review and document analysis. Data were sourced from peer-reviewed journals, fintech regulatory entries, and industry whitepapers. Based on the research sophistication model represented in the presentation from the workshop, an analytical framework of ethical risk mapping (Map Out → Identify → Assess → Defend directions) was utilized.

Findings and Analysis

Fintech's Inclusionary Role

Case Study – Rise of Fintech in India:

Millions were added to the formal financial ecosystem due to mobile payments and UPI services. Asif et al. This expansion played an important role in increasing access to essential services for low-income and rural populations and was often a form of outside-the-box KYC by way of identity linked to Aadhaar (2023).

Ethical Risks in AI Applications

Bias in Lending Models:

Goldstein et al. (2019) provide an example of AI-based underwriting enhancing the bias found in the training data. This might be because if a dataset contains information relating to hundreds of years of human history, whereby one group was unfairly treated, we see one group receive a lower credit score than another group, even though they share similar financial situations.

Transparency Failures:

According to Nawayseh (2020), however, the competing demand on the availability of apps to users led to unethical practices of opaque data practices during COVID-19, as it was found that users unknowingly agreed to the disclosure of personal data in exchange for fast credit.

Open Banking and Responsibility Gaps

- **The problem of being held accountable:**

A third-party data model uses open banking which opens customer information. Navaretti et al. According to Ghosh and Wolf (2018), even the responsibility of breaches is unclear→ on bank or fintech firms. The gap is proving difficult to close with regulatory patchwork.

- **Transforming Trust into a Commodity**

According to Gabor and Brooks (2016), fintech commodifies trust. This is a risk that we are taking because trust, originally based on the regulation of institutions, is exchanged for convenience or rewards.

Discussion

Interpretation:

The results reveal a mixed dynamic: while fintech enables users by gaining access, it simultaneously undermines protection through deregulation and complexity. Voraciously rooting for opening up the fintech box and trying to shut it again, the aforementioned article aligns with Schueffel (2017) and, in some respects, is the opposite of it: fintech needs to be bound with science and ethics.

Need for Innovation in Regulation:

Existing models are reactive. Instead, regulatory technology (regtech) adaptive frameworks may be used to automate compliance and real-time risk detection (Singh & Sharma, 2023).

AI Governance Innovation:

Source: Ethical AI Frameworks (Goldstein et al.) (2019) are essential. Financial firms doing further opaque decision-making should deploy fairness audits, bias detection procedures, and XAI (Explainable AI).

Conclusion and Recommendations

Summary:

Fintech has certainly expanded financial inclusion, but without sufficient data governance and ethical oversight, it is likely to deepen inequality and undermine trust.

Recommendations:

- Ensure cross-sector, cross-border fintech governance standards on data protection, algorithmic transparency, and user consent.
- Eagerness to encourage public-private partnerships in RegTech.
- Implement strategies for digital literacy to enable users.
- Promote third-party audits of AI models in subclasses like financials.

Future Research:

More work is required on how decentralised finance (DeFi) may help democratise access at the same time as minimising risks, especially in the Global South.

References

Asif, M., Nair, M., Raghavan, P. & Ali, M. 2023, 'The Impact of Fintech and Digital Financial Services on Financial Inclusion in India', *Journal of Risk and Financial Management*, vol. 16, no. 2, pp. 122. https://doi.org/10.3390/jrfm16020122.

Gabor, D. & Brooks, S. 2016, 'The Digital Revolution in Financial Inclusion: International Development in the Fintech Era', *New Political Economy*, vol. 22, no. 4, pp. 423–436. https://doi.org/10.1080/13563467.2017.1259298.

Goldstein, I., Jiang, W. & Karolyi, G.A. 2019, 'To FinTech and Beyond', *Review of Financial Studies*, vol. 32, no. 5, pp. 1647–1661. https://doi.org/10.1093/rfs/hhz025.

Navaretti, G.B., Calzolari, G., Mansilla-Fernandez, J.M. & Pozzolo, A.F. 2018, 'Fintech and Banking. Friends or Foes?', *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3099337.

Nawayseh, M.K.A. 2020, 'FinTech in COVID-19 and Beyond: What Factors Are Affecting Customers' Choice of FinTech Applications?', *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 6, no. 4, pp. 153. https://doi.org/10.3390/joitmc6040153.

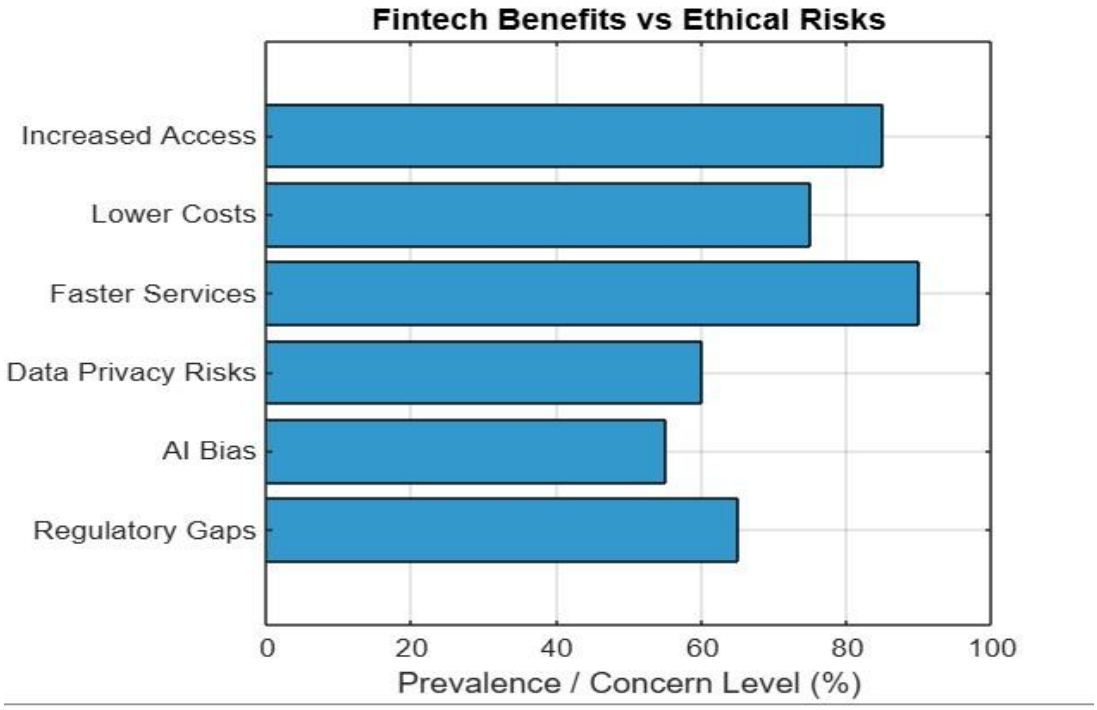
Schueffel, P. 2017, 'Taming the Beast: A Scientific Definition of Fintech', *Journal of Innovation Management*, vol. 4, no. 4, pp. 32–54. https://doi.org/10.24840/2183-0606_004.004_0004.

Singh, A. & Sharma, L.M. 2023, 'Fintech and Financial Inclusion: Transforming Underserved Access to Financial Services', *International Journal of Tourism and Hotel Management*, vol. 5, no. 2, pp. 71. https://doi.org/10.22271/27069583.2023.v5.i2a.71.

Appendix A (MATLAB CODE)

INFORAPHIC 1 BARCHART (MATLAB)

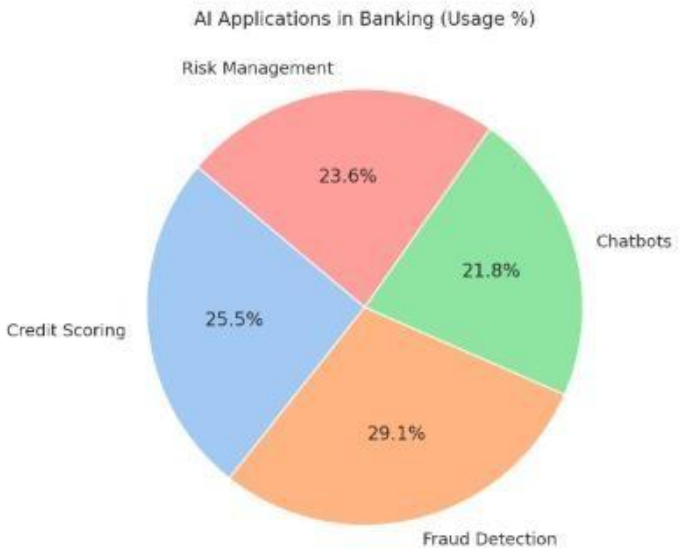
```
% Data
categories = {'Increased Access', 'Lower Costs', 'Faster Services', ...
'Data Privacy Risks', 'AI Bias', 'Regulatory Gaps'}; values = [85, 75, 90, 60, 55, 65];

% Create horizontal bar chart figure; barh(values, 'FaceColor', [0.2 0.6 0.8]);

set(gca, 'YTickLabel', categories, 'YTick', 1:numel(categories), 'YDir','reverse');
xlabel('Prevalence / Concern Level (%)'); title('Fintech Benefits vs Ethical Risks'); grid on;
```



INFORAPHIC 1 PIE (MATLAB)

% Data labels = {'Credit Scoring', 'Fraud Detection', 'Chatbots', 'Risk Management'}; data = [70, 80, 60, 65];

% Create pie chart figure; pie(data, labels);
title('AI Applications in Banking (Usage %)');



MUHAMMAD'S REPORT ON

Personalized Banking and Customer Data

Table of Contents

Executive Summary

This paper addresses the ethics and governance issues related to the commodification of consumer data in personalized banking. Under a literature review modus operandi, the critique floats important points around transparency, informed consent, and algorithmic bias. There are already some frameworks (GDPR and others) but if you compare them to the race carts for the DAA you realize just how far behind data analytics and the tools for data analytics are. It recommends a multilayered approach to governance: regulation, ethics at an organizational level, and technical aspects, like algorithmic transparency or privacy by design.

Introduction

Background on Data Commodification in Banking

The financial services sector has changed beyond recognition with technological advances and the use of big data and AI. Amid this ever-shifting environment, personalized banking has emerged as a significant theme, driven by the use of vast amounts of consumer data to offer bespoke financial products and services. However, this is also equivalent to a direction into data commodification, that is, treating personal and behavioral information as an asset and monetizing the asset (Saarijärvi et al., 2015).

Importance of Data Governance and Ethics

As the centrality of consumer data in banking continues to rise, good governance of data becomes even more vital. The interweaving issues around governance of consent, transparency, algorithmic accountability, and privacy rights further highlight the shortcomings of conventional top-down governance in a data economy. As pointed out by Fernandes and Pinto (2019), trust is core to the success of retail banking and the mismanagement of data is likely to have a disastrous impact on customer relationships.

Research Objectives and Questions

This research investigates:

How personalized banking practices commodify consumer data.

The governance and ethical challenges associated with these practices.

The efficacy of current governance frameworks in addressing risks.

Structure of the Report

This report is organized into the following sections: a literature review of governance and ethical frameworks, the methodology employed, a detailed analysis of findings, a discussion of implications, and a conclusion with recommendations. Each section integrates research sophistication using the "Map out – Defend" analytical process from the provided visual framework.

Literature Review

An Introduction to Data Governance Frameworks

Modern data governance within banking is no longer only the typical rules and standards surrounding data quality, compliance, and security. Yet there are many gaps in existing frameworks when it comes to real-time decision-making, transferring across borders, and ethical concerns (Ghasemaghaei, 2019). Big data analytics introduces a further complication in the sense that frameworks are needed that encourage innovation yet are also accountable (Cao et al., 2015).

Ethical Challenges of Banking on Data Commodification

It's not enough for a bank to simply operate ethically, they must also be responsible when it comes to the information they collect from their customers. Individualized bank algorithms may have the effect of discriminating (or manipulating) against individuals. Huang and Lin (2005) insist that customer-oriented personalization must stay away from the ethical edge of the surveillance-capital of them.

Existing policies and regulations

International guidelines like GDPR seek to protect personal data, but enforcement in rapidly changing industries is often uneven. Indeed, Srivastava and Gopalakrishnan (2015) analyze the difficulty for Indian banks to pass the regulatory structure into a real commitment towards ethical conduct.

Primary and Secondary Sources, with Proper Citations

Relevant studies, such as those of Fernandes and Pinto (2019), Kumar et al. (2021), and Saarijärvi et al. (2015) highlight increasing worries regarding transparency, trust, and fairness in banking personalization. Fatma and Rahman (2016) have proven that CSR in data usage helps to increase consumer trust (the strength of ethical branding).

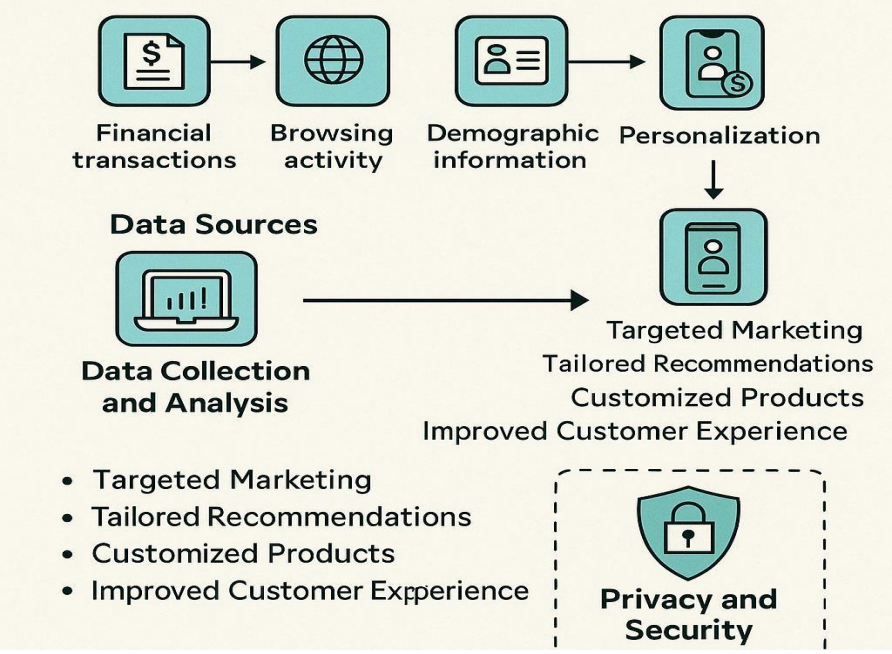
Methodology

Research approach and methods deployed

The paper adopts a qualitative literature-based analytical methodology consistent with the map out, tease out, Identify & Assess framework from the classroom model. It seeks to incorporate both scholarly and policy perspectives on governance challenges.

Data Collection Process

Information was gathered from 10 academic peer-reviewed sources, with a concentration on personalized banking, data analytics, and governance. Regulatory documents (e.g., GDPR) and industry reports also shaped the regulatory environment.



Analytical Framework Applied

Map out stakeholders and risks.

Tease out core ethical dilemmas.

Identify & assess consequences and benefits.

Engage with governance structures.

Explain alternative approaches.

Defend positions with literature.

Point out innovations and research gaps.

Findings and Analysis

Case Studies and Into Governance Risks of Data Commodification

Data about consumers in banking has been rapidly commoditized leveraging AI and profiling tools. 'AI filtered' Many big banks, like JPMorgan Chase and HSBC, are using AI to examine spending habits, mobile device behavior, and even social media trends to create more personalized credit products and financial services. These advancements are expected to enable superior personalization of customer offers and enhance the experience but also create profound challenges related to transparency, algorithmic bias, and informed consent.

Research by Kumar et al. (2021) shows that many consumers remain uninformed about how their behavioral and transactional data is captured and used for decision-making. They interfere with both customer autonomy and the power balance between financial organizations and their customer.

Challenges in Governance and Dimensions of Risk

The key governance risks of data commodification in banking may be divided into three key categories:

Transparency Gaps: Users lack information and insight into how their data is used and contribute directly to opaque decision-making processes (Elgendy & Elragal, 2016).

Algorithmic Bias MODELS ARE DISCRIMINATORY: FROM BIAS TO DISCRIMINATION In the above case, predictive models can inadvertently amplify the levels of existing disparities in lending (credit scoring), leading to discrimination in the built environment that the models aim to predict (Cao et al., 2015).

Consent Circumvention: The apps and platform facilitated data collection methods escape or override any strong consent system in place (Srivastava and Gopalakrishnan 2015).

Ethical Issues and Impact on Consumers

The moral dangers of such practices are extensive. The abuse or overreach of customer data leads to more than potential discrimination; it also results in a tremendous loss of trust in the financial system. Hyper-personalization as it's been presented as a consumer benefit—can edge toward the coercive, or to put it plainly, manipulating our decisions with microtargeted offers and behavioral nudges. Indeed, as Fatma and Rahman (2016) suggest, in the absence of true ethical engagement, CSR initiatives can seem to be no more than empty gestures.

Towards Multilayered Governance Strategy

To address new risks, banks need to embrace multi-level data governance, combining regulatory, firm, and technical defenses:

Further transparency of data: Organizations will need to make it explicit as to how user data is collected, processed, and applied. Enabling users' action by data literacy and easy opt-in/out choices, should be the baseline (Kumar et al., 2021).

Privacy by Design & Algorithmic Transparency: Ethical practices around data must be incorporated within the design of systems. The use of decision-making support tools in lending (Elgendy & Elragal, 2016) should be auditable, explainable, and accountable.

Internal Governance & Oversight: Implementing internal ethics review boards, consistent algorithm audits, and making space for stakeholders to provide feedback are vital for enacting ethical standards beyond the superficial whims of regulations.

Discussion

Interpretation of Findings

While personalization may enhance consumer satisfaction (Arbore & Busacca, 2009), it challenges fairness and autonomy. The results are consistent with those of Saarijärvi et al. (2015) who argue for a more substantive ethical underpinning for how consumer data is used.

Comparison with Existing Governance Models

Traditional compliance-focused models (e.g., GDPR) do not adequately account for emergent AI risks. In contrast, frameworks incorporating "ethics-by-design" and algorithm audits offer more proactive governance (Ghasemaghaei, 2019; Elgendy & Elragal, 2016).

Potential moving Somewhat surprisingly, when one considers the potential for advances in transportation systems that describe, innovative solutions seem remarkably thin on the ground.

- **Data Trusts:** Legal entities that manage personal data on behalf of users.
- **Ethical Auditing Systems:** Regular evaluations of AI models for fairness and bias.
- **Interactive Consent Platforms:** User-friendly ways for customers to understand and control data sharing.

Conclusion and Recommendations

Summary of Key Insights

Customized banking is a case study of the promise and peril of commodifying data. While driving service innovation and customer satisfaction, it also represents ethical and governance risks that should be addressed expeditiously.

Policy Implications for Better Governance

- Mandate algorithmic transparency in banking.
- Require periodic ethical audits of personalization models.
- Drive initiatives around customer data literacy to elevate the users.

Future Research Directions

- Explore cross-cultural impacts of personalization ethics.
- Develop quantitative models to measure trust erosion.
- Investigate AI interpretability tools for financial services.

References

Arbore, A. & Busacca, B., 2009. Customer satisfaction and dissatisfaction in retail banking: Exploring the asymmetric impact of attribute performances. Journal of Retailing and Consumer Services, 16(4), pp.271–280. https://doi.org/10.1016/j.jretconser.2009.02.002

Cao, M., Chychyla, R. & Stewart, T., 2015. Big Data Analytics in Financial Statement Audits. Accounting Horizons, 29(2), pp.423–429. https://doi.org/10.2308/acch-51068

Elgendy, N. & Elragal, A., 2016. Big Data Analytics in Support of the Decision-Making Process. Procedia Computer Science, 100, pp.1071–1084. https://doi.org/10.1016/j.procs.2016.09.251

Fatma, M. & Rahman, Z., 2016. The CSR's Influence on Customer Responses in the Indian Banking Sector. Journal of Retailing and Consumer Services, 29, pp.49–57. https://doi.org/10.1016/j.jretconser.2015.11.008

Fernandes, T. & Pinto, T., 2019. Relationship Quality Determinants and Outcomes in Retail Banking Services: The Role of Customer Experience. Journal of Retailing and Consumer Services, 50, pp.20–33. https://doi.org/10.1016/j.jretconser.2019.01.018

Ghasemaghaei, M., 2019. Does Data Analytics Use Improve Firm Decision-Making Quality? The Role of Knowledge Sharing and Data Analytics Competency. Decision Support Systems, 120, pp.14–24. https://doi.org/10.1016/j.dss.2019.03.004

Huang, E.Y. & Lin, C.Y., 2005. Customer-oriented financial service personalization. Industrial Management & Data Systems, 105(1), pp.26–44. https://doi.org/10.1108/02635570510575171

Kumar, P., Mokha, A.K. & Pattnaik, S.C., 2021. Electronic customer relationship management (ECRM), customer experience, and customer satisfaction: Evidence from the banking industry. Benchmarking: An International Journal, 28(9), pp.2722–2743. https://doi.org/10.1108/bij-102020-0528

Saarijärvi, H. et al., 2015. Unlocking the transformative potential of customer data in retailing. The International Review of Retail, Distribution and Consumer Research, 25(5), pp.504–517.

https://doi.org/10.1080/09593969.2015.1105846

Srivastava, U. & Gopalkrishnan, S., 2015. Impact of Big Data Analytics on Banking Sector: Learning for Indian Banks. Procedia Computer Science, 50, pp.643–652. https://doi.org/10.1016/j.procs.2015.04.098

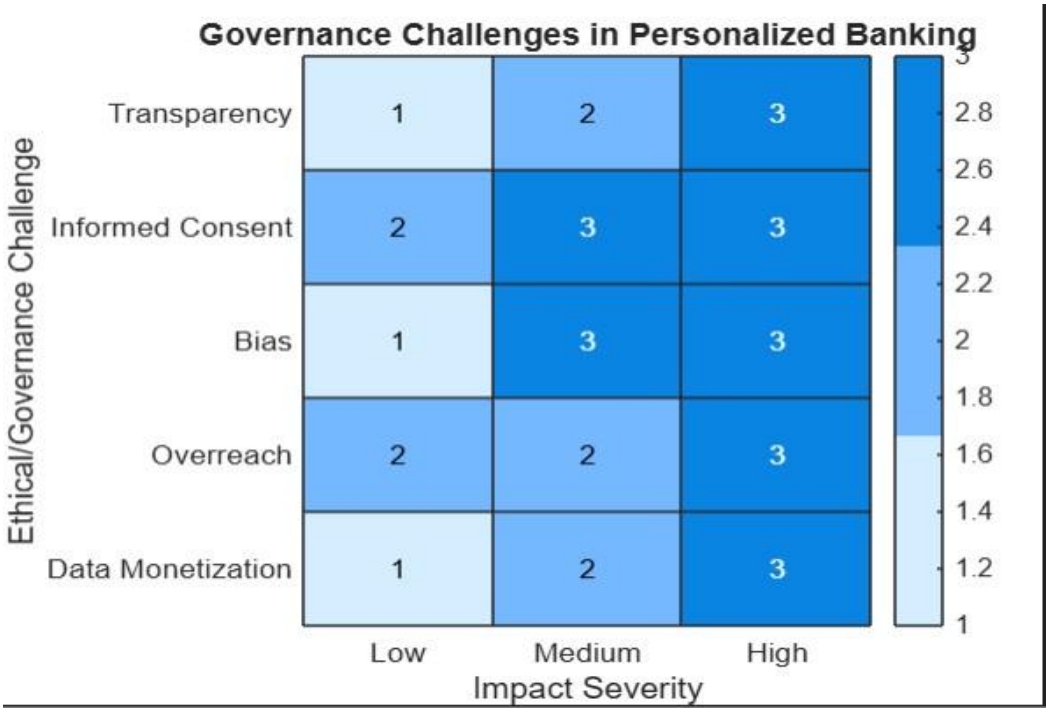
Appendix A: MATLAB Code

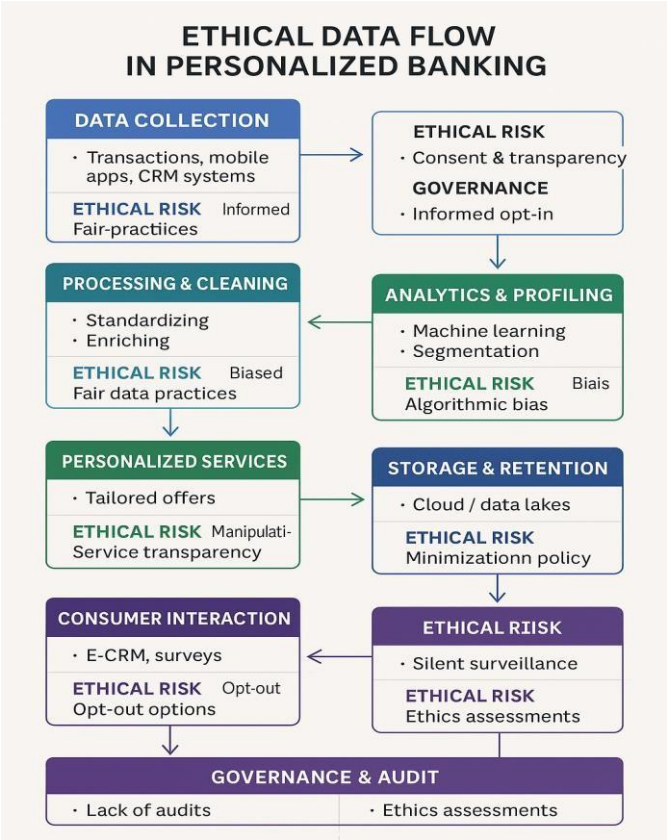
MATLAB Code – Governance Challenges in Personalized Banking (Heatmap)

```
% Define challenges and impact levels challenges = {'Transparency', 'Informed

Consent', 'Bias', 'Overreach', 'Data Monetization'}; impact = {'Low', 'Medium',

'High'};


% Define the risk matrix (rows = challenges, columns = impact levels)

risk_matrix = [

1, 2, 3;

2, 3, 3;

1, 3, 3;

2, 2, 3;

1, 2, 3

];
```

```
% Define custom colormap (approximating Plotly hex colors in RGB)

% Hex "#d4eeff" -> [212 238 255]

% Hex "#74b9ff" -> [116 185

255] % Hex "#0984e3" -> [9

132 227] custom_colormap = [

212 238 255;

116 185 255;

9 132 227

] / 255;  % Normalize RGB values to 0–1


% Create heatmap h = heatmap(impact,

challenges, risk_matrix, ...

'Colormap', custom_colormap, ...

'ColorbarVisible', 'on', ...

'ColorScaling', 'scaled');


% Set title and axis labels

h.Title = 'Governance Challenges in Personalized Banking';

h.XLabel = 'Impact Severity';

h.YLabel = 'Ethical/Governance Challenge';
```

Appendix B: Charts and Graphs





DYLAN'S REPORT ON

Artificial Intelligence in Banking

Introduction

Artificial Intelligence helps in the transformation of banking sectors, streamlining tasks from customer onboarding to fraud detection. These algorithms rely significantly on sensitive data raising important ethical and regulatory concerns. As AI is used for making tremendous decisions, robust data governance cannot be perceived as optional. This report discusses how banks can manage these challenges using AI, when AI becomes necessary, and the consideration of Generative AI.

Topic: Artificial Intelligence in Banking

Lately, Banks and Financial Services have relied on Artificial Intelligence to automate several processes such as verifying whether a customer being onboarded is not a robot or a fraud, verifying the legitimacy of a transaction, initiating payments, and much more. It is important to note that processes rely on confidential information and sensitive data. It, thus, becomes necessary to adhere to certain rules and regulations. For example, banking and financial applications use AI-powered software such as onfido (Onfido, 2025) to capture a video of the user during an onboarding journey. In this case, there is a possibility that the system extracts the voice message of the user. AI Algorithms can use this information to draw inferences to derive new data that can be exploited by companies for their benefit. This is, clearly, unethical and hence countries end up imposing regulations wherein the system should ask the user for their consent and inform them about how their data will be used before proceeding with the onboarding journey.

In an interview - The impact of Data and AI on Banking (SASSoftware, September) , Balaji Narayan Murthy, President and Head of the Business Intelligence Unit, at Axis Bank mentions the key lessons learned while leading a mature analytics team. According to him, it is necessary to be tightly integrated with the business. While solving business problems tied up with banks emphasis must be given to data governance beyond analytics. "Data governance is the force multiplier for the power of analytics given the non-negotiable regulations in place. Better quality of rules and data beats better algorithms any day. We must ensure the quality of data, making sure that the table adds up to the General Ledger balance of a particular product of a bank – a way of becoming a better business analyst" says Narayan Murthy. While he considers dealing with data of high calibre is the root of solving bank problems effectively, he also believes that SaaS (Software as a Service) probably powered by Artificial Intelligence is the best way to empower his employees which essentially gives his team the right tools and infrastructure so that hundreds of bank-related experiments can be done, operations can be run at a large scale and more can be learned. Besides, not only does it help to prevent the same data from being interpreted differently but also enables teams to make their own decisions provided it fits in a

data governance and analytical framework. It helps them to make decisions across the board thereby demonstrating the power of decisions that are data-driven and not gutdriven. AI, furthermore, enables them to make informed decisions ensuring that the right flowers bloom.

Considering the management of large volumes of proprietary data and often fluid business models, banks have become early adopters of AI and Deep Learning technologies. Such systems have been created for management processes, loss mitigation, fraud prevention, customer retention, and delivering efficiency gains and profit growth. AI unlocks the door to automation. Repetitive and mechanical tasks performed by humans are replaced with elegant algorithms. This not only helps to improve the productivity of bankers but also minimizes the scope of operational errors. Trade AI, a document processing system developed by Standard Chartered in Association with IBM has proved itself successful in getting unstructured documents reviewed in different formats, identifying and classifying them, and learning from their performance. For even more sophisticated solutions, banks are on the quest to harness the power of Generative AI. This would help in reducing costs, increasing revenue, providing new capabilities, and ultimately have an implication on the assessment of banks' credit quality. There has, furthermore, been phenomenal progress in deploying applications at scale to generate hyper-personalized products and accelerate software engineering, and modernization of programs. Augmentation of humans' abilities through AI chatbots or virtual assistants is a current project of a partnership between Morgan Stanley and Open AI. Generative AI can even be used in legacy applications to improve their efficiency. For instance, digitization and automation of customer-facing processes generate digital data trails. Generative AI can use them to fine-tune services and internal processes to yield further digitalization including hyper-scale customization which aids in better client segmentation and retention (Fernández, 2025). Risk management, data collection, reporting, and monitoring can be improved through these digital data trails.

While Generative AI comes with many benefits, its risks should not be unnoticed. There are four types of risks associated with Generative AI namely data poisoning, reverse engineering, deepfakes, and non-compliance (Alam, 2024). Initially, it was difficult to manage humans operating on the same chain of data. On the flipside, if AI was used a lot of algorithms tend to rely on non-human readable format. With no control over what the data looks like, it becomes vulnerable to getting poisoned. Sometimes the data can be poisoned intentionally by hackers while at other times the data is just a natural culmination of human bias. Hence, banks relying on such data are susceptible to great danger. In the case of reverse engineering, a rival gleams insight into the structure, functionality, and data an ML model was trained on to solve competitive, security-sensitive, and fintech domains. In addition, there have been instances where bad actors have developed processes to fake their identities which have had a profound impact on facial recognition and know-your-customer (KYC) procedures that are inherent to fintech and banking sectors. Lastly, it becomes difficult to build algorithms subject to a regulatory AI landscape where the laws, rules, standards, and policies are generally never unified.

Conclusion

While Artificial Intelligence has been used to solve many use cases of banks, banks should be cautious about the associated risks such as data poisoning, regulatory gaps, and identity fraud. This calls for strong governance frameworks. The banking sector's primary focus should be critically aligning innovation with ethical and legal standards. Ultimately, AI and ethical practices will help in defining define the trust and success of future banking systems.

Bibliography

Onfido. (2025). Retrieved from

https://onfido.com/?utm_source=google&utm_medium=ppc&utm_campaign=BrandUKI&gad_source=1

SAS software. (September 2024). Retrieved from

https://www.youtube.com/watch?v=bPjqtG8ifa4

Fernández, M. (2025). Retrieved from

https://www.spglobal.com/en/researchinsights/special-reports/ai-in-banking-ai-will-be-an-incremental-game-changer

Alam, A. (2024, January). Retrieved from

https://www.forbes.com/councils/forbestechcouncil/2024/01/10/the-risks-andbenefits-of-generative-ai-in-banking/

ANURAG'S REPORT ON

Regulation and Compliance in Data Commodification

Background: Data Commodification in Banking

The economic plan of the financial industry for the monetization of information has caused a host of concerns related to regulation and compliance since the industry views customer information as a precious economic asset (Aalto 2018). The advent of open banking platforms, driven mainly by the PSD2 directive, has made the exchange of personal finance data between banks and third-party provider (Aalto 2018) easier. Although the platforms have the purpose of promoting competition and enhancing consumer choice, they also present risks tied to the security vulnerabilities, privacy concerns, and challenges of consumer protection.

(Crain 2018) questions the supposition that transparency is a good enough solution for obviating structural power imbalances, as such revelations often do not empower consumers to exert effective agency. For the banking industry specifically, this imbalance is enhanced through the intimate aspect of financial information and the accompanying risks of its abuse (Crain 2018). (Kornelis 2022) also notes that the rapid development of digital technology in the banking industry has moved beyond the regulations as they stand, thus increasing the consumer's exposure to cyber risks and leading to a lack of legal safeguards. As a result of this, there is a growing need for regulatory structures that incorporate ethical concerns as well as compliance requirements to promote consumer trust.

Regulatory Frameworks: Laws and Standards

Various essential regulatory systems have been developed to protect consumer rights during the commercialization of information despite existing risks. The GDPR establishes European Union data protections through its main regulatory framework that addresses provisions about consent requirements and data minimization together with transparency standards (Serrado *et al.* 2020). The GDPR enshrines robust security measures for information and gives individuals a range of rights for access, editing, and erasure of information. Its extraterritorial application also impacts the practice of privacy on a global level.

The revised PSD2 also promotes competition by mandating data-sharing subject to customer consent, while introducing strict authentication requirements (Aalto 2018). PSD2 expands the regulatory landscape by allowing authorized third-party providers access to the data held by financial institutions, thus bringing new compliance challenges.

At the same time, the Anti-Money Laundering Act of 2020 within the US updated the regulations regarding beneficial ownership and monitoring of transactions as a means of combatting exploitation of finances (Galeazzi *et al.* 2021). The AMLA represents an initial convergence of legal regimes addressing concerns regarding privacy and preventing malfeasance. Together, the supervisory regimes blend stringent compliance measures with variegated governance models as a means of harmonizing innovation and consumer protection within complex economic landscapes.

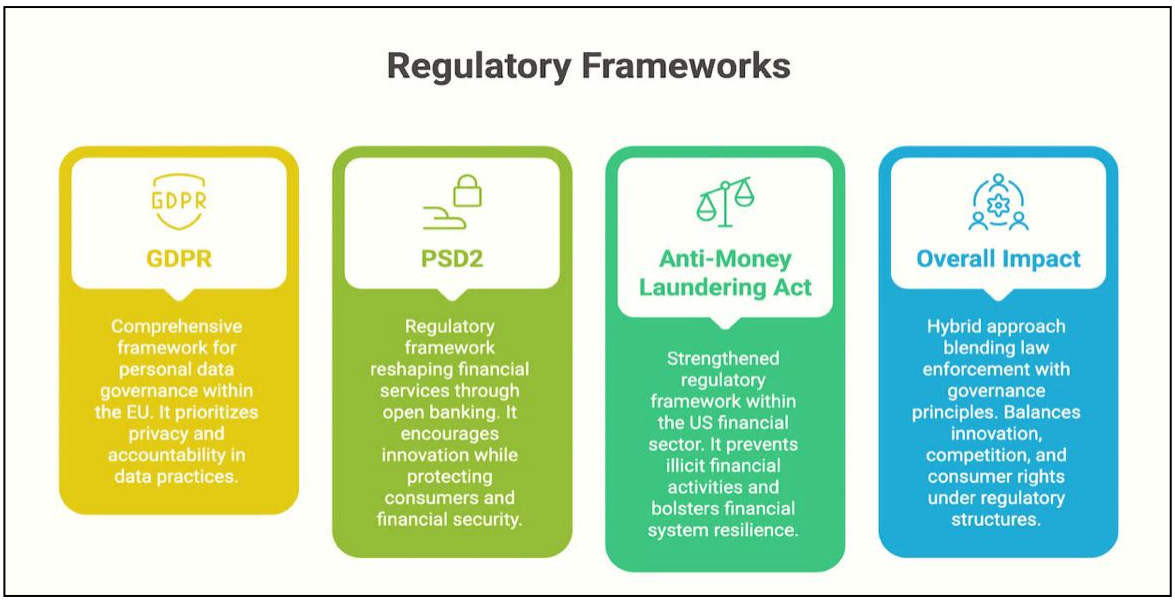


Figure : Regulatory Framework (Author's own)

Compliance Challenges: Gaps and Struggles

Despite the achievements attainable in instituting the regulations, banks and financial institutions are constantly faced with challenges of compliance that dilute the effectiveness of the structures put in place. The rapid development of emerging trends such as decentralized finance (DeFi) platforms and digital wallets tends to overwhelm regulated institutions' capacity to keep pace accordingly and thus creates significant uncertainties regarding the contours of the compliance regulations that are not clearly defined (Obeng *et al.* 2024).
The picture shows the key challenges faced by the regulators of these institutions as a result of complex compliance needs including information governance and privacy issues, anti-money laundering (AML) procedures, and the growing complexity of the supervisory environment.

Figure : Compliance Challenges (Tambey July 2023)

These are aggravated by inherent complexities within the organization and especially due to the growing trend of outsourcing such vital functions like analysis, management of data, and risk assessment to outside vendors (Obeng *et al.* 2024). This dependency creates significant challenges regarding transparency and due diligence appropriateness. Furthermore, the inconsistency of international regulatory regimes, as illustrated by the sweeping GDPR of the European Union and the more diffuse set of regulations characteristic of the United States, enhances the cost of cross-border compliance while maximizing operational risks (Serrado *et al.* 2020). According to (Crain 2018), regulations designed to improve transparency are often advanced as tools of consumer empowerment; they do not grant significant agency as a result of hazy consent procedures and complex procedures of managing data.

Case Study: HSBC Money Laundering Scandal

The 2012 HSBC scandal highlighted the dependence on lax compliance procedures and the absence of effective data governance practice. It happens when the realization came to the role of HSBC in managing drug cartel moneys and terror group financial transactions by the U.S. regulators slapped a hefty penalty worth $1.9 billion on the institution (Rana *et al.* 2024). Later investigations revealed severe shortcomings in the transaction monitoring procedures and the inability of the institution to implement effective controls within.

These failures demonstrate the way through which weak information governance as typified by the lack of proper gathering, monitoring, and responding to pivotal transactional information can contribute to significant systemic weaknesses. After disapproving regulations, wholesale restructuring of compliance structures was done at HSBC as it made huge investments in monitoring capacity and information governance improvement (Rana *et al.* 2024). This example shows that to have a real opportunity for integrity protection in the banking industry, there is a need for strong information management practices to be put into the compliance structures.

Risk Governance Opportunities: Innovative Ideas

Banks constantly reshape their risk governance due to arising threats. Reg Tech delivers automated compliance monitoring for the detection of anomalies in real-time and for enhanced due diligence (Obeng *et al.* 2024). Systems with intelligent algorithms automatically identify suspicious patterns much faster than human reviews.
Nevertheless, overdependence on technology is not enough. Involvement of ethical values in governance structures is increasingly suggested. (Kornelis 2022) argues that the sustenance of consumer trust within digital platforms requires ethical management beyond basic technical compliance. Creation of internal data ethics committees might oversee the commodification of consumer information such that such practices align with privacy-anchored principles.

Furthermore, harmonization of global regulatory standards is of utmost importance. International efforts, spearheaded by the Financial Stability Board and the Financial Action Task Force, encourage standardization of data privacy, security, and AML regulations across jurisdictions (Galeazzi *et al.* 2021). A higher degree of regulatory harmonization would minimize issues of compliance and improve consumer protection on a global scale.

References

Aalto, J. (2018) 'A review of PSD2 and its impact to payment services business of banks in EU', available: https://urn.fi/URN:NBN:fi-fe2018050923705

Crain, M. (2018) 'The limits of transparency: Data brokers and commodification', *New media & society*, 20(1), 88-104, available: https://doi.org/10.1177/1461444816657096

Galeazzi, M.-A., Mendelson, B. and Levitin, M. (2021) 'The anti-money laundering act of 2020', *Journal of Investment Compliance*, 22(3), 253-259, available: https://doi.org/10.1108/JOIC-05-2021-0023

Kornelis, Y. (2022) 'Digital banking consumer protection: Developments & challenges', *Jurnal Komunikasi Hukum (JKH)*, 8(1), 378-394, available: https://doi.org/10.23887/jkh.v8i1.44477

Obeng, S., Iyelolu, T.V., Akinsulire, A.A. and Idemudia, C. (2024) 'The transformative impact of financial technology (FinTech) on regulatory compliance in the banking sector', *World Journal of Advanced Research and Reviews*, 23(1), 2008-2018, available: https://doi.org/10.30574/wjarr.2024.23.1.2184

Rana, I., Khan, O., Siddiqi, Z., Nasim, S. and Zaidi, S. (2024) 'Financial Crime In The Banking Industry', *Pmanagement Studies*, 4(2), 1-16, available: https://www.pmanagementstudies.com/wp-content/uploads/2024/12/1.-FINANCIAL-CRIME-IN-THE-BANKING-INDUSTRY.pdf

Serrado, J., Pereira, R.F., Mira da Silva, M. and Scalabrin Bianchi, I. (2020) 'Information security frameworks for assisting GDPR compliance in banking industry', *Digital Policy, Regulation and Governance*, 22(3), 227-244, available: https://doi.org/10.1108/DPRG-02-2020-0019

Tambey, A. (July 2023) 'Automated Regulatory Compliance in Banking for Better Data Security', available: https://community.automationedge.com/t/automated-regulatory-compliance-in-banking-for-better-data-security/10058

CONCLUSION

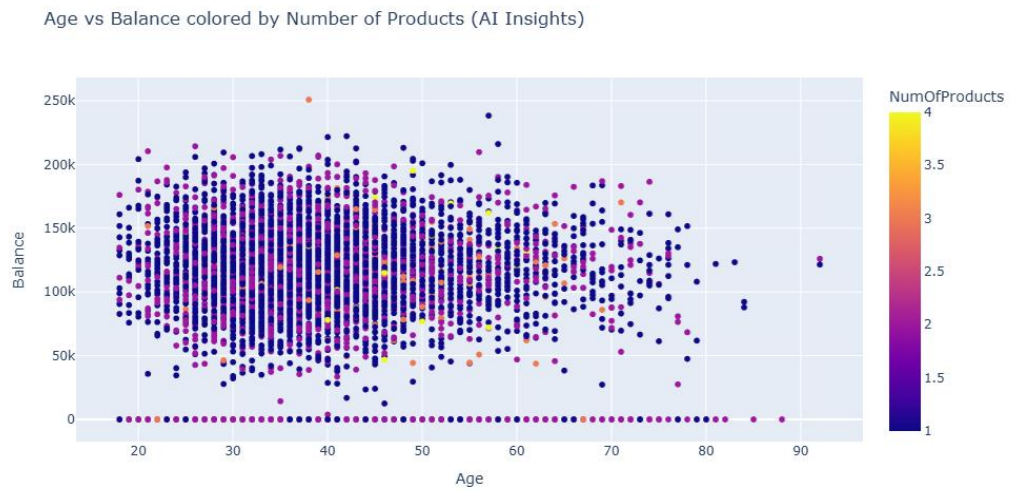
In aggregate, the four reports in this series consider the three aspects of progress in data commodification and artificial intelligence (AI) within banking that have the potential to affect profound and far-reaching change, as well as the formidable ethical, regulatory, and governance challenges those changes pose. Information commodification through open banking and AI-powered personalized products and services may foster competition and provide opportunities for end-users. However, it also raises concerns about privacy, security, and algorithmic bias-related risks. Regulatory structures such as GDPR offer some protection but struggle to keep pace with a fast-changing world, including those governed by decentralized finance (DeFi) and other AI uses. The reports highlight the importance of sustainable data governance beyond compliance-oriented processes, integrating ethical compliance, algorithmic transparency, informed consent, and privacy by design. They also recommend a layered governance structure that implements regulation, organizational ethics, and advanced technologies like RegTech to control risk. AI models and data practices must align with society and consumer protection norms. Ultimately, the reports emphasize that while such innovations promise significant financial inclusion and efficiency gains, they come with significant trade-offs that need to be managed to avoid inadvertently deepening disparities or undermining consumer confidence.

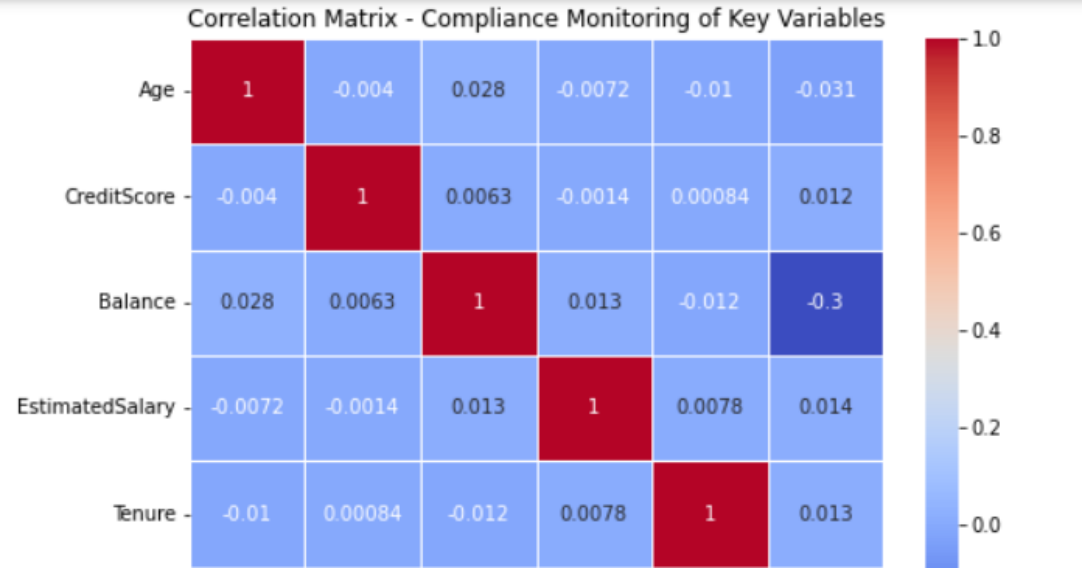
Appendix A (MATLAB CODE)

MATLAB code using a common dataset for banking

```
% --- Corrected Premium MATLAB Code ---


% Load the dataset

data = readtable('Bank dataset.csv');


# Visualization of All aspects of the Complete topic


figure;

gscatter(data.Age, data.Balance, data.NumOfProducts);

title('Age vs Balance colored by Number of Products');

xlabel('Age');

ylabel('Balance');

grid on;


figure;

complianceVars = {'Age', 'CreditScore', 'Balance', 'EstimatedSalary', 'Tenure',
'NumOfProducts'};

complianceData = data{:, complianceVars};

corrMatrix = corr(complianceData, 'Rows','complete');

heatmap(complianceVars, complianceVars, corrMatrix, 'Colormap', parula,
'ColorLimits',[-1 1]);

title('Correlation Matrix - Compliance Monitoring of Key Variables');
```

Appendix B (VISUALIZATION)





Appendix C (Meeting Logs)

Theme: Banking in Data Commodification

Members:

Muhammad Mujahid Ghare

Anurag Raju Kalamkar

Riddhi Raghvendra Panchale

Dylan Alastaire Rodrigues

Meeting 1: Initial Planning

Date: 02nd April 2025

Platform: Microsoft Teams & WhatsApp

Time: 9:30 PM

Attendees:
Anurag Raju Kalamkar

Muhammad Mujahid Ghare

Riddhi Raghvendra Panchale

Agenda:

- Discussion on previous assignment topics
- Selection of a new topic for the upcoming assignment
- Distribution of research and writing tasks
- Communication and collaboration methods

Key Points Discussed:

Previous Topics:

- Anurag: Computer Vision & Autonomous Vehicles
- Riddhi: Brand Monitoring in Computer Vision
- Muhammad: Finance in Data Governance

New Topic Selection:

The group decided to select a new topic not covered previously.

- Anurag suggested topics provided by the professor: Insurance, Banking, and Credit Rating.
- Riddhi supported the focus on Banking, expressing interest in exploring the role of financial technologies.
- The group unanimously selected Banking in Data Commodification.

Task Distribution:

3000-word report, with 1000 words per member.

Subtopics discussed: Ethics, Security, and Modes of Payment.

- Riddhi emphasized the importance of including a discussion on the ethical implications of data commodification in banking.
- Agreed to confirm with the professor if varying subtopics within banking were acceptable.

Collaboration Plan:

A common folder was to be created for sharing resources.

A WhatsApp group was established for faster communication if Teams was inaccessible.

Meeting 2: Topic Finalization & Coordination

Date: 10th April 2025

Platform: Microsoft Teams

Time: 7:30 PM

Recorded by: Anurag Raju Kalamkar

Attendees:
Anurag Raju Kalamkar
Muhammad Mujahid Ghare
Riddhi Raghvendra Panchale

Agenda:

- Finalize individual topics under the group's theme
- Ensure alignment with report requirements
- Coordinate next steps

Discussion Summary:
Topic Confirmation:

- Muhammad: Personalized Banking and Consumer Data
- Riddhi: Fintech and Democratisation of Financial Services
- Anurag: Regulation and Compliance in Data Commodification

- All confirmed topics were aligned under "Banking in Data Commodification".

Documentation & Communication:

- Anurag confirmed that the report format was available on Brightspace.
- Group topics were documented and circulated via chat for clarity.

Next Steps:

- Muhammad proposed that each member develop a baseline draft.
- Riddhi suggested that the group meet for a quick check-in after initial drafts to discuss cohesion.
- Agreement to hold additional sessions for peer review and feedback.

Updates:

- Document structure was shared by Muhammad on 15th April.
- Dylan joined the group on 23rd April and selected "Artificial Intelligence in Banking" to complement the group's focus.

Meeting 3: **Final Integration & Report Assembly**

Date: 01st May 2025

Platform: Microsoft Teams

Time: 4:59 PM

Attendees:
Muhammad Mujahid Ghare

Dylan Alastaire Rodrigues

Anurag Raju Kalamkar

Riddhi Raghvendra Panchale

Agenda:

- Confirm report format and merging process
- Discuss appendices, tools used, and references
- Set final deadlines and responsibilities

Discussion Summary with Speaker Attribution:

Unified Report Structure:

- Muhammad reaffirmed that the professor required a common structure to reflect collaborative work.

- Dylan inquired if strict adherence to the structure was necessary; it was agreed to follow it.
- The format was decided: One report with separate sections, a shared introduction, a conclusion, and an appendix.

Content Merging:

- Dylan proposed a short planning session to coordinate the merging of the sections.
- Muhammad confirmed that each member's section would remain distinct but coordinated.

Professor Feedback:

- Anurag conveyed the professor's approval of personal wording, with all content under one umbrella. Frameworks and tools should be detailed.

Appendix & Tools:

- Anurag reminded members to document any external tools (e.g., MATLAB or apps) in the appendix.
- Dylan mentioned a pending infographic, to be completed within an hour.
- Muhammad noted that MATLAB was optional but should be acknowledged if used.

References:

- Anurag asked about citing sources.
- Muhammad clarified that each member should include references in their section; no global reference list is needed.

Summaries & Final Draft:

- Muhammad asked all members to provide a 4–5-line summary of their content to help build the introduction and conclusion.
- Riddhi, Dylan, and Anurag agreed to share summaries when ready.
- Riddhi offered to help with the introduction and conclusion once the summaries were shared.

Topic Order & Flow:

- Muhammad confirmed the order of topics was planned to ensure coverage of all key aspects.

Coordination & Finalization:

- Members agreed to notify each other via WhatsApp upon completing their parts.