



The Edge Economic Update

The Impact of AI on Banking & Finance

September 2025



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Introduction

Artificial Intelligence (AI) is dramatically transforming the banking and financial services sector worldwide. From early algorithmic trading programs to today's AI-driven chatbots and fraud detectors, financial institutions have integrated AI to enhance efficiency, decision-making, and customer experience. Major regions such as the United States, China, and the Gulf Cooperation Council (GCC) countries have witnessed rapid AI adoption in finance, supported by both technological advances and strategic government initiatives. This report provides a comprehensive overview of AI's evolution in financial services, examines regional developments (including the GCC, US, China, and the global context), and analyzes the benefits and drawbacks of AI in banking. It concludes with strategic recommendations for GCC banks to harness AI's potential while mitigating challenges.

Historical Evolution of AI in Financial Services

1980s – Early Innovations: The late 20th century saw the first forays of AI into finance, primarily in capital markets. In the 1980s, quantitative hedge funds and trading desks began using computer models for **statistical arbitrage** – exploiting price discrepancies across markets. Expert systems were introduced to replicate human decision-making in finance; for example, DuPont built over 100 expert systems, reportedly saving nearly \$10 million annually. By 1982, the founding of Renaissance Technologies (a pioneering quant fund) exemplified AI-driven finance, using mathematical models on petabyte-scale data for trading. By the late 1980s, more than two-thirds of Fortune 1000 companies had at least one AI project, reflecting broad interest in automation.

1990s – Rise of Rule-Based Systems: In the 1990s, AI applications expanded to risk management and fraud detection. Banks deployed rule-based AI systems that flagged anomalies in transaction patterns, an approach that significantly improved **fraud detection** compared to manual methods. A notable example was the U.S. Treasury's FinCEN AI system, which reviewed over 200,000 bank transactions per week and identified 400 potential money-laundering cases (worth nearly \$1 billion) in two years. Credit scoring also benefited from early machine learning (ML) models in this era, yielding more accurate predictions of loan defaults than traditional scoring techniques. These successes demonstrated AI's promise in enhancing financial security and credit risk assessment.



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2000s – Machine Learning and Data Proliferation: The 2000s marked a turning point as digital banking took off and data volumes exploded. With the rise of internet and mobile banking, financial firms gained access to vast datasets, enabling **predictive modeling** and customer analytics using ML. Banks began using machine learning for tasks like **risk management** (e.g. modeling market and credit risks) and customer segmentation for marketing. The launch of personal finance platforms like Mint.com in 2006 illustrated AI's entry into retail finance – Mint used ML algorithms to give users personalized budgeting and financial advice. During this period, regulators and banks also started exploring AI for regulatory compliance and anti-money-laundering (AML) monitoring, foreshadowing the RegTech innovations of the next decade.

2010s – FinTech Disruption and AI Ubiquity: In the 2010s, AI became pervasive across many financial domains. **High-frequency trading (HFT)** powered by AI/ML algorithms grew to dominate equity markets, executing millisecond-level trades beyond human capability. **Robo-advisors** emerged to automate investment portfolio management for consumers, leveraging AI to balance and rebalance assets according to client goals. AI-driven fraud detection advanced further: banks replaced static rule-based systems with dynamic ML models capable of detecting complex, evolving fraud patterns in real time. AI also improved credit underwriting – online lenders like LendingClub and Prosper used machine learning to evaluate borrower creditworthiness faster and often more inclusively than traditional methods. By the end of the decade, virtually all major financial institutions were investing in AI, whether in front-office customer interactions or back-office process automation. Bank of America's "**Erica**" chatbot, launched in 2018, is one example: it reached over 6 million users by 2019, helping customers with balance forecasts and bill reminders via a simple conversational interface. Meanwhile, regulators worldwide began examining AI's implications, with a focus on algorithmic transparency and systemic risks, as AI grew deeply embedded in financial infrastructure.

2020s – The Era of Deep Learning and Generative AI: The current decade has brought even more powerful AI techniques into finance, notably **deep learning** and generative AI. Banks now use deep neural networks for **portfolio optimization**, market trend prediction, and even sentiment analysis on news that could affect asset prices. FinTech startups and incumbents alike leverage AI for **automated customer service** (e.g. AI chatbots handling millions of inquiries), **personalized financial planning**, and **real-time anomaly detection** in transactions. Generative AI – typified by large language models (LLMs) like ChatGPT – has captured industry attention for its ability to automate content creation, coding, and complex customer interactions. Banks have started piloting generative AI to draft research reports, produce conversational answers in customer support, and assist with code generation for software projects. At the same time, global regulators (e.g. the European Central Bank and the Bank of England) are assessing how widespread AI use might impact financial stability, noting both the benefits and new risks it brings. In summary, from humble expert systems to advanced deep learning models, AI's integration into financial services has been steadily accelerating – reshaping how banks operate and compete in the digital age.



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Global Trends in AI Adoption in Banking

AI adoption in banking is a global phenomenon, driven by both competitive pressures and technological progress. A 2024 global survey found that 78% of organizations use AI in at least one business function, up from 55% just a few years prior. In banking specifically, a large majority of institutions have deployed AI/ML models: in one 2023 industry survey, 73% of banks reported using AI or machine learning tools, with fraud detection being the most common use case (84% of those banks use AI for fraud monitoring). This widespread uptake reflects AI's proven value in core banking functions – from detecting fraudulent transactions to automating loan decisions.

Globally, investment in AI for financial services is soaring. Analysts estimate AI could contribute up to \$15.7 trillion to the world economy by 2030, with banking expected to be a major beneficiary. The United States and China lead in overall AI investment and research, but other

regions are also moving quickly to leverage AI in finance. Europe's banks, for example, are adopting AI while working within stricter regulatory frameworks (such as GDPR for data privacy and the forthcoming EU AI Act) – emphasizing “explainable AI” and risk controls to ensure compliance and fairness. In developing markets, AI is seen as a leapfrogging tool to expand financial inclusion. Global institutions like the World Bank and IMF have noted the potential of AI-driven fintech to broaden access to credit and financial services in regions such as South Asia and Africa, where traditional banking reach was limited.

Generative AI trends are also global in scope. A recent McKinsey study estimated that generative AI could add \$2.6–4.4 trillion in economic value annually across industries, on top of benefits from prior generations of AI. Banking is singled out as one of the sectors with the highest potential gains from gen AI, given its data-intensive processes and customer interaction needs. Consequently, banks worldwide

are exploring gen AI for tasks like drafting compliance documents, providing human-like virtual assistants, and analyzing vast unstructured data (e.g. legal contracts or earnings call transcripts) for insights.

However, the global push for AI comes with heightened oversight. International bodies – from the Financial Stability Board (FSB) to the Basel Committee – have initiated discussions on AI governance in finance, aiming to mitigate systemic risks (such as many banks relying on a few big AI providers) and to prevent unintended consequences like market herd effects. There is also a shared recognition of AI's ethical challenges; for example, issues of algorithmic bias in credit decisions or potential job displacement are sparking debates in financial centers from New York to London to Singapore. We will later examine these disadvantages in detail. First, we turn to specific regional landscapes to see how AI in banking is unfolding in practice.



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AI in the United States Financial Sector

The United States hosts one of the most advanced AI-enabled financial industries, led by large banking institutions and a vibrant fintech ecosystem. U.S. banks have invested heavily in AI R&D and infrastructure – for instance, JPMorgan Chase increased its technology budget to \$11.4 billion in 2019, explicitly channeling funds into AI and machine learning initiatives. This investment is yielding concrete applications across various banking services:

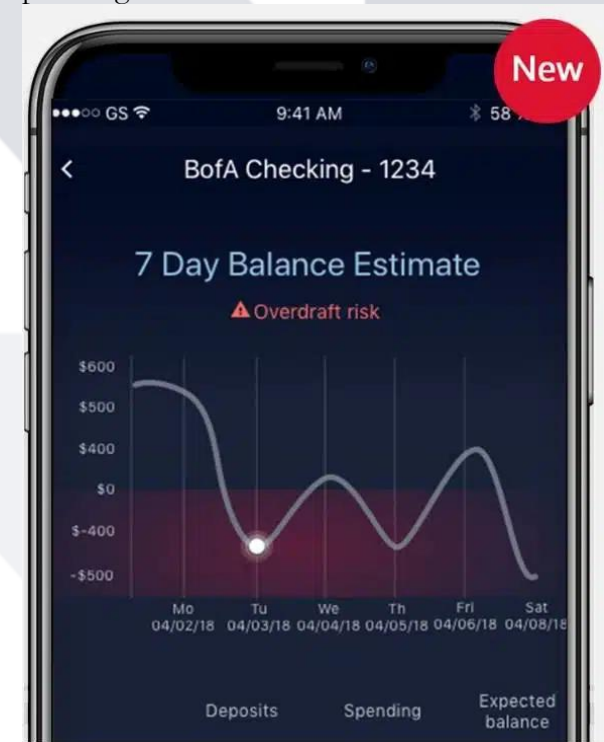
AI for Process Automation: JPMorgan’s notable in-house AI system, COiN (Contract Intelligence), uses machine learning to review legal documents (like credit agreements) in seconds – a task that previously took 360,000 hours of manual work. By 2017, COiN was deployed to analyze thousands of complex contracts, dramatically cutting operating costs and error rates in document processing. U.S. banks have similarly applied AI-driven optical character recognition and NLP to

automate paperwork ranging from mortgage applications to compliance reports.

Customer Service Chatbots: Several leading American banks have launched AI virtual assistants to enhance customer service. Bank of America’s “Erica” is a prime example – a chatbot within its mobile app that can handle balance queries, bill reminders, money transfers, and more via voice or text. Introduced to all customers in 2018, Erica surpassed 6 million users by 2019. It provides proactive insights, such as warning a customer if their spending patterns indicate a risk of overdraft in the coming week. This has improved customer engagement and satisfaction, while reducing call center loads. Other banks (Wells Fargo, Capital One, etc.) have similarly rolled out AI chatbots or integrated services into platforms like Facebook Messenger to offer 24/7 support in a cost-effective way.

Illustration: Bank of America’s mobile AI assistant “Erica” provides customers with personalized insights, such as a **7-day balance forecast** that flags potential

overdraft risks. By analyzing a user’s deposits and spending patterns, AI can help proactively warn and advise customers (e.g. to save funds or avoid fees), thereby improving financial planning and trust.





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Fraud Detection and Security: U.S. banks widely leverage AI for fraud prevention, benefiting from large datasets of transactions to train models. According to a Risk Management Association survey in 2023, 84% of banks' AI/ML usage is in fraud detection – making it the top AI use case in banking. Banks employ algorithms that monitor real-time transaction streams and customer behavior to spot anomalies (e.g. unusual locations, amounts, or device fingerprints) indicative of fraud. CitiBank, for example, invested in an AI company (Feedzai) and integrated its software to enhance fraud and anti-money laundering monitoring across global transactions. These AI systems can freeze or flag suspicious activities far faster than human review, significantly reducing fraud losses. U.S. insurer USAA and others have also noted success using AI to proactively detect identity theft and credit card fraud, saving money and protecting customers.

Risk Management and Trading: Wall Street firms were early adopters of AI in trading. Today, quantitative trading groups at banks and hedge funds use AI to identify trading opportunities and

manage portfolios. AI models digest news, market data, and even satellite imagery or social media sentiment to make split-second trading decisions or to optimize portfolios. In addition, banks use machine learning in credit risk – for instance, refining credit score models by incorporating non-traditional data and more complex patterns than classic credit bureau metrics. During the Federal Reserve's stress tests, some banks have even applied AI to improve capital planning models (Citi worked with an AI startup, Ayasdi, to help with regulatory stress-test modeling). Furthermore, large U.S. banks employ AI for regulatory compliance and monitoring. JPMorgan developed a program using NLP to help parse and flag regulatory changes and compliance documents, reducing the manual burden on compliance teams.

The U.S. fintech sector also drives AI innovation. Companies like PayPal use AI to instantly assess transaction fraud risk, while upstart lenders (e.g. Upstart) use AI credit models to approve consumer loans often overlooked by traditional metrics, reportedly achieving lower default rates at the same time. Overall, U.S. financial

institutions credit AI with increasing efficiency and revenue: a Boston Consulting Group study found banks using AI effectively could boost their productivity by 30-50% in certain functions, though many firms are still in pilot phases. Importantly, U.S. regulators (like the Office of the Comptroller of the Currency and the Federal Reserve) are actively studying AI's impact, issuing guidance on model risk management and fair lending to ensure AI tools are used responsibly (for example, emphasizing that AI credit decisions must still comply with anti-discrimination laws). This balancing act between innovation and oversight continues to shape AI's trajectory in American banking.



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AI in China's Financial Sector

China has embraced AI in banking and finance at an unprecedented scale, spurred by a tech-savvy population, big tech companies entering finance, and strong government support. Chinese financial institutions – from state-owned banks to fintech giants – have integrated AI across nearly every aspect of banking:

Digital Payments and Fintech Ecosystem: China's fintech boom, led by platforms like Ant Group's Alipay and Tencent's WeChat Pay, was built on AI algorithms that manage payments, credit, and investments for hundreds of millions of users. A famous example is Ant Group's AI-driven "310" lending model, which offers instant, collateral-free microloans to small businesses and individuals. The process takes 3 minutes to apply, 1 second to approve, with 0 human intervention, thanks to AI algorithms analyzing borrower data on the fly. This model slashed the cost per loan to around 2 RMB (about \$0.30), enabling Ant's MYbank to profitably serve tens of millions of small borrowers

who previously lacked access to credit. AI models evaluate alternative data (e.g. e-commerce sales, utility payments) to score credit, often outperforming traditional methods and vastly improving financial inclusion. Similarly, Ant's Yu'e Bao money market fund – once the world's largest – used AI to personalize investment recommendations and manage liquidity for over 300 million investors.

AI-Powered Digital Banks: China's neobanks and incumbent banks alike heavily use AI to scale their services. WeBank, China's first online-only bank (backed by Tencent), serves more than 340 million individual customers and 2.8 million SMEs through a completely digital platform. WeBank attributes its ability to handle this volume to AI and automation: over half its employees are engineers, and its per-account IT cost is only about ¥2.2 (≈\$0.40) – roughly one-tenth that of traditional banks. AI underpins WeBank's credit decisioning, allowing loan approvals in seconds rather than days. The bank also deploys AI for customer interactions (chatbots), facial recognition for remote know-your-

customer (eKYC) verification, and federated learning techniques to train ML models on distributed data without compromising privacy. These technologies let WeBank operate at high efficiency and reach customers that brick-and-mortar banks found too costly to serve, demonstrating how AI can drive financial inclusion. As WeBank's CFO noted, many Chinese individuals and SMEs that couldn't get loans from traditional banks now obtain credit in seconds through such AI-driven processes.

Facial Recognition Payments and Biometrics: Chinese consumers have grown accustomed to AI-based biometrics in finance. In 2017, Ant Financial (now Ant Group) launched "Smile-to-Pay", the world's first commercial facial-recognition payment system, which allows users to pay at kiosks by simply smiling at a camera. Major banks in China have installed facial recognition ATMs and branch kiosks for secure customer authentication. AI vision systems verify identities in real time, reducing fraud (e.g. catching fake IDs) and adding convenience (no need for



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cards or phones for payment). While raising privacy debates, these systems illustrate China's rapid adoption of AI in everyday banking transactions. Moreover, voice recognition and natural language processing are deployed in customer service hotlines – many Chinese banks use AI voicebots that can converse in dialects to handle routine inquiries.

Credit Scoring and Risk Management: Traditional Chinese banks (e.g. ICBC, Bank of China) have integrated AI into risk management and underwriting, often in partnership with tech firms. They leverage AI for credit scoring beyond the formal credit bureau system. For instance, Chinese lenders use ML models to evaluate small business loan applications by analyzing sales, tax data, and even satellite images of business activity. AI-driven credit platforms like Ping An's OneConnect offer other banks AI tools for risk assessment, fraud detection, and even regulatory reporting. According to a Nature journal study, Chinese banks widely apply AI for credit scoring, customer relationship management, and automated customer support. The government's push for a national Digital

Currency/Electronic Payment (DCEP) (the digital yuan) also leverages AI to monitor transactions and detect illicit activity, underscoring how deeply AI is woven into China's financial infrastructure.

Government and Policy Support: The Chinese government has explicitly prioritized AI in its national strategies, which has direct effects on the finance sector. In 2017, China's State Council issued the New Generation AI Development Plan, setting ambitious AI targets. Regulators encouraged banks to innovate with AI, and local governments created AI innovation hubs (e.g. in Shenzhen, Hangzhou) that include fintech sandboxes. Notably, major Chinese banks launched large funding programs for AI: the Bank of China initiated a 5-year, \$138 billion financing program specifically to invest in AI and tech industries. The central bank (People's Bank of China) and others have similar funds, signaling that banks are not just users of AI but also financiers of the AI industry's growth. This symbiotic relationship (banks funding AI companies, and using their innovations)

accelerates adoption. China's tech giants – Alibaba, Tencent, Baidu – further blur the line between tech and finance, embedding financial services in their platforms and exporting AI solutions to traditional banks.

China's aggressive adoption of AI in finance has yielded tangible benefits: millions of previously unbanked or underbanked consumers now have credit and insurance via AI-driven platforms, payment fraud has reportedly declined due to AI security checks, and operating costs for many transactions have plummeted. However, it's not without challenges. Data privacy is a growing concern among the Chinese public as AI surveillance expands. Additionally, the reliance on foreign AI chips and software has prompted government efforts for self-reliance (e.g. developing domestic AI chips, as noted by President Xi in 2025). Internationally, China's AI-forward approach in finance is watched closely: it offers a blueprint for fintech-led financial inclusion, but also raises questions about how to balance innovation with privacy and fairness – questions that Chinese regulators are now grappling with as well.



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AI in Banking and Finance in the GCC Countries

The nations of the Gulf Cooperation Council (GCC) – including the UAE, Saudi Arabia, Kuwait, Qatar, Bahrain, and Oman– are actively investing in AI as part of broader economic modernization agendas (such as Saudi’s Vision 2030 and the UAE’s National AI Strategy). In the financial sector, GCC banks and regulators see AI as a means to improve efficiency, enhance customer experience, and position their economies at the forefront of fintech innovation. While still developing relative to US or China, the GCC region has made notable strides in AI adoption in banking:

National Strategies and Investment: Several GCC countries have launched national AI programs which encompass financial services. The UAE was the first nation to appoint a Minister of AI and has an AI strategy aiming to make the government (including financial regulators) more AI-driven by 2031. Saudi Arabia established the Saudi Data & AI Authority (SDAIA) and targets

becoming a global AI leader by 2030. These top-down initiatives translate into substantial investments: AI is expected to contribute \$320 billion to the Middle East economy by 2030, with Saudi Arabia alone projected at \$135 billion (12.4% of its GDP) and the UAE about 14% of GDP from AI gains. This reflects extraordinary annual growth in AI’s economic contribution (estimated 20–34% per year in the region). Much of this AI value is anticipated in finance, via productivity boosts and new digital services.

Bank Innovation and Use Cases: Leading GCC banks, particularly in the UAE and Saudi Arabia, have begun integrating AI solutions. Emirates NBD (ENBD), one of the largest banks in the UAE, undertook a comprehensive AI-driven transformation starting in 2021. The bank built over 100 AI models across its business in two years and assembled a 70+ person analytics team to deploy use cases from customer personalization to process automation. ENBD uses predictive AI to create tailored customer experiences – for example, a hyper-personalization engine offers retail clients

investment advice suited to their behavior and needs, even for first-time investors. The bank reports that by embedding AI in decisions “from boardroom to customer interactions,” it aims for a 5–7x return on investment through efficiency and revenue gains.

In terms of customer-facing AI, Gulf banks have experimented with interactive robots and virtual assistants. For instance, Emirates NBD introduced a humanoid robot “Pepper” in some branches as early as 2016 to engage customers with basic information and entertainment. While Pepper was more of a marketing novelty, it signaled the bank’s digital-friendly brand and gathered feedback on public interaction with AI. More practically, ENBD also launched an AI-powered voice assistant in its phone banking system to authenticate customers and handle inquiries in English and Arabic, speeding up service while easing call center workloads.



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Illustration: Emirates NBD deployed “Pepper,” a friendly AI-powered humanoid robot, at select UAE branches and events. Pepper can greet customers, answer basic questions, and guide them to services in an engaging way. GCC banks are using such innovations to familiarize customers with AI and enhance the banking experience with a modern, interactive touch.

AI in Saudi Banking: Saudi Arabia’s banks are rapidly adopting AI under regulatory encouragement and competitive drive. The Saudi Central Bank (SAMA) created a regulatory sandbox that has approved over 20 fintech solutions (many leveraging AI) in

support of Vision 2030 goals. Major banks like Saudi National Bank (SNB) have implemented AI for both risk and customer service. SNB uses an AI-based fraud detection system to scrutinize client transactions and behavior, flagging anomalies in real time^[79]. It also offers 24/7 AI-driven chatbot support to customers in multiple languages, providing instant responses and freeing up human agents for complex issues. Another leading institution, Al Rajhi Bank, introduced an AI chatbot (“Rafi”) for its mobile app and online banking to handle customer requests conversationally in Arabic – reflecting how banks tailor AI to local language and cultural context. Beyond retail, Saudi banks apply AI in compliance (for example, to meet new anti-beneficial ownership regulations by intelligently monitoring corporate structures) and in credit underwriting for SMEs, where AI helps analyze alternative data to extend loans to more small businesses.

Kuwait, Qatar, and Others: Smaller GCC markets are also moving ahead with AI pilots. In Kuwait, Kuwait Finance House (KFH) – one of the region’s top

Islamic banks – launched “Fahad”, described as Kuwait’s first AI-powered virtual employee, in mid-2025. Fahad is essentially a life-sized digital avatar/robot that can interact with branch visitors: it explains KFH’s products, answers customer questions, and even guides users on ATM usage in both Arabic and English. This always-on digital employee exemplifies how GCC banks marry AI with physical presence to enhance service. KFH has also used AI for sentiment analysis of customer calls to get real-time feedback and improve service quality. In Bahrain, banks like Bank ABC and Gulf International Bank have launched digital-only offerings (e.g. mobile-only banks) that rely on AI for personalized financial advice and automated onboarding (using facial recognition and document AI). Qatar’s banks are exploring AI for compliance and cybersecurity, aligning with the country’s national AI strategy (Qatar released one in 2019). Across the GCC, fintech startups specializing in AI (for payments, lending, regtech, etc.) are emerging, often partnering with incumbent banks under the favorable eye of regulators who see fintech as a way to



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diversify hydrocarbon-dependent economies.

Regional Collaboration: GCC banks and governments also collaborate on AI knowledge-sharing. The Arab Monetary Fund and regional conferences (like the annual Fintech Abu Dhabi and Saudi’s LEAP tech conference) facilitate exchange of AI best practices in finance. A McKinsey 2024 report noted that while GCC organizations are quick to pilot generative AI, only a few are capturing significant value yet – implying many banks are still in experimentation mode and need to scale up deployments strategically.

The benefits of AI in GCC banking are anticipated to be substantial – improved operational efficiency, better fraud prevention, and enhanced customer offerings – which are crucial as these banks compete internationally and with fintech entrants. Yet, the GCC also faces unique challenges. There is a skills gap in AI and data science within the region’s financial sector; banks often rely on expatriate talent or external vendors for advanced AI solutions. Recognizing this,

some GCC banks have launched internal “AI academies” to upskill staff, and universities in UAE/Saudi are expanding AI programs. Another challenge is data localization and privacy: as governments mandate local data storage (for security and sovereignty), banks must build robust local cloud or data center solutions for AI, often in partnership with global cloud providers (e.g. Microsoft and Oracle are opening cloud regions in the UAE and Saudi to support such needs). On regulation, GCC regulators so far have been innovation-friendly – for instance, Bahrain and Abu Dhabi were among the first to create fintech sandboxes in the region – but they are also conscious of risks like cyber threats and consumer protection, working on AI guidelines in banking. We will next delve into the general advantages and disadvantages of AI in banking, many of which resonate in the GCC context as well.



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Key Benefits of AI in Banking and Finance

AI technologies offer numerous benefits for banks and financial institutions, driving value in areas ranging from efficiency and cost savings to improved decision-making and customer satisfaction. Below are some of the most significant advantages of AI in the banking and finance sector:

Improved Operational Efficiency and Cost Reduction: AI automation dramatically speeds up processes that were previously manual and time-consuming. This boosts productivity and lowers operating costs. For example, JPMorgan's AI document reviewer COiN can analyze 12,000+ credit agreements in seconds, a task that would require hundreds of thousands of labor hours by lawyers. Similarly, robotic process automation (RPA) bots (often powered by AI) handle routine back-office tasks like data entry, reconciliations, and report generation much faster and with fewer errors than humans. A McKinsey survey found that companies adopting AI in

finance saw on average a 30% reduction in processing times for key workflows. The savings from such efficiency gains can be re-invested in innovation or passed to customers. Digital-only banks illustrate the efficiency potential: WeBank in China, by leveraging AI and cloud infrastructure, operates at roughly one-tenth the cost per customer of traditional banks. AI also works 24/7, enabling continuous operations (e.g. automated loan approvals at midnight) without additional staff shifts.

Enhanced Fraud Detection and Security: Fraud prevention has been one of AI's biggest triumphs in finance. Machine learning models can sift through vast volumes of transaction data in real time to detect suspicious patterns or anomalies that signal fraud – far beyond the scale of rule-based systems or human teams. These AI systems improve both the speed and accuracy of fraud detection. For instance, banks now catch many credit card fraud attempts instantly by using ML models that recognize deviations from a cardholder's usual spending behavior (location, merchant, amount, etc.). According to the Risk

Management Association, 84% of banks use AI/ML for fraud detection, reflecting how integral it has become. AI has helped reduce false positives as well (genuine transactions wrongly flagged), by better contextualizing customer behavior. Beyond transactions, AI secures other areas – such as using facial recognition or voice biometrics to authenticate customers (preventing identity theft), and AI-based anti-money laundering systems that can identify complex money laundering schemes by correlating entities and transactions across networks. The net effect is a safer financial system with lower fraud losses and greater customer trust.

Better Risk Management and Decision Making: AI greatly assists in risk modeling and predictive analytics. In lending, AI-powered credit scoring considers a broader set of variables (including unconventional data) and complex nonlinear relationships, leading to more accurate predictions of default risk. As a result, banks can approve credit to worthy borrowers who might be overlooked by traditional methods, while avoiding high-risk exposures – improving



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the overall loan portfolio performance. A study by the University of Missouri found that banks using AI were better at identifying creditworthy borrowers, lending more to safe borrowers and less to risky ones, thereby lowering default rates. In the field of investment management, AI can analyze market data, economic indicators, and even news sentiment to forecast market movements or optimize asset allocations. This helps in portfolio risk management (e.g. AI-driven hedging strategies) and potentially higher returns for clients. AI is also used in stress testing and risk monitoring: banks employ ML models to continuously scan for emerging risks (like liquidity crunch signals or operational risk anomalies), enabling a more proactive risk management approach. Overall, AI provides richer insights and data-driven forecasts, aiding human managers in making more informed, timely decisions in areas such as pricing, capital allocation, and financial planning.

Personalized Customer Experience and Service: Through AI, banks can deliver hyper-personalized services at scale, which was not feasible before. AI

algorithms analyze customer data (transaction history, website/app behavior, demographics) to tailor recommendations and interactions for each individual. This means customers receive relevant product offers (e.g. a pre-approved loan or a higher-yield savings account when data indicates it's suitable), personalized financial advice, and even customized alerts that align with their habits. Wells Fargo's AI-based "Predictive Banking" feature, for example, notifies customers of upcoming bills that are higher than usual or suggests moving excess funds to savings if their balance is larger than typical. Such timely, personalized nudges help customers manage their finances better and increase their engagement with the bank. Chatbots and virtual assistants also contribute to personalization – they greet customers by name, recall past inquiries, and adapt responses based on a user's profile. Bank of America's Erica chatbot can proactively warn a user days in advance if their spending patterns might lead to a zero balance, effectively providing a personalized financial planning alert. This level of individual attention improves customer satisfaction and loyalty.

Importantly, AI enables 24/7 customer service: AI chatbots and voice assistants handle routine queries anytime, in multiple languages, with instant responses. This always-available support (with the option to escalate to humans for complex cases) significantly improves service quality and convenience. Banks have reported higher customer retention and even sales uplifts from AI-driven personalization – for instance, one US bank saw a 15% increase in online product conversions after implementing an AI recommendation engine on its app.

Automation of Compliance and Reduction of Errors: Banks face onerous compliance and regulatory reporting duties, which AI can streamline. RegTech solutions with AI can automatically monitor transactions for regulatory compliance (KYC, AML rules), generate required reports, and keep track of regulatory changes. This reduces human error (which can lead to fines) and saves compliance officers from drowning in paperwork. AI systems can parse legal texts and flag relevant changes for action – for example, scanning updates to sanction lists or capital requirement rules



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and alerting the bank if policies need adjustment. By one estimate, AI-based compliance automation can cut related costs by 20–30% while improving accuracy. Additionally, AI helps ensure data quality and consistency in reports by validating entries and reconciling discrepancies across systems, thus improving the integrity of financial reporting. Some large banks use NLP to read through trade communications and filings to detect any compliance red flags that need investigation (market abuse, insider trading signals, etc.), a task practically impossible to do manually at scale. By automating these complex oversight tasks, AI not only saves costs but also strengthens the institution's control and audit processes.

Financial Inclusion and New Services: AI is enabling new models that reach underserved populations. As seen with microloan platforms and mobile banking in emerging markets, AI can evaluate creditworthiness without traditional credit histories, using alternative data like mobile phone top-ups or utility payments. This means banks and fintechs can extend loans, insurance, or

savings products to millions of new customers (e.g. rural customers or gig economy workers) profitably – a clear social and commercial benefit. AI-driven advisory services (like robo-advisors) have also lowered the cost of investing, allowing people with smaller assets to get portfolio advice that was once only economical for wealthy clients. In short, AI helps democratize financial services by reducing marginal costs and customizing products for different segments.

In combination, these benefits translate into a more efficient, customer-centric, and resilient financial industry. Banks that effectively implement AI have seen results such as shorter loan decision times (from days to seconds), higher fraud detection rates, better cross-sell revenue from personalized offers, and streamlined operations. The next section will consider the other side of the coin – the challenges and risks that accompany the rise of AI in banking.



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Challenges and Disadvantages of AI in Banking and Finance

While AI brings substantial benefits, it also introduces a range of challenges and potential drawbacks that banks and regulators must address. Key disadvantages and concerns include:

Ethical Concerns and Bias: AI systems can inadvertently perpetuate or even amplify biases present in historical data. In finance, this raises serious ethical and legal issues – for example, an AI lending model might systematically favor or disfavor certain groups (by geography, race, gender, etc.) if those biases are reflected in the training data. Such algorithmic bias can lead to unfair or discriminatory outcomes, like denying loans to qualified minority applicants due to biased correlations. Detecting and correcting these biases is challenging because complex AI models often operate as “black boxes.” The lack of transparency (or explainability) in many AI decisions makes it hard for banks to ensure the models’ outputs are fair and for consumers to understand or contest

decisions. In the EU and other jurisdictions with strict fairness laws, this could result in compliance violations. As a result, explainability and fairness have become top concerns for financial institutions using AI. For instance, a 2023 survey of bank risk managers found that ensuring AI models are explainable and conceptually sound was a primary issue, closely followed by ensuring they are free from prohibited biases. Banks now often need to implement “AI ethics” committees and bias testing frameworks to mitigate this risk – a complex task that adds overhead and may limit the use of opaque (but powerful) AI techniques.

Job Displacement and Workforce Impact: The efficiency gains from AI and automation come with the downside of potential job losses in the banking sector. Many traditional roles – from bank tellers and customer service reps to middle-office analysts – can be augmented or outright replaced by AI systems. A well-publicized analysis by Wells Fargo in 2019 projected that about 200,000 U.S. banking jobs could be eliminated over the subsequent decade due to AI and automation. Reductions of

this magnitude (roughly 10% of the workforce) would be the largest since the 2008 financial crisis. Roles that involve repetitive data processing or simple customer inquiries are most at risk. This transition creates social and organizational challenges: employees may face unemployment or the need to reskill into new positions (data science, AI oversight, etc.), and banks may encounter internal resistance or morale issues as the workforce adapts. There are also broader economic questions – if many jobs are lost to AI across industries, consumer demand could fall, affecting the economy that banks operate in. Ethically, some argue banks have a responsibility to retrain staff for new roles (“the human-in-the-loop” to work alongside AI) or to redeploy them rather than simply conduct mass layoffs. In any case, workforce disruption is a significant downside that needs careful management through retraining programs and thoughtful implementation of AI (gradually phasing it in, finding new roles for displaced workers, etc.).

High Implementation Costs: Adopting AI is not cheap – it requires significant



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investment in technology, data infrastructure, and talent. Banks may need to spend heavily on computing power, cloud services, and software licenses for AI platforms, as well as on acquiring data (and ensuring its quality). There is also a competitive shortage of skilled AI professionals, who command high salaries. In the GCC, for example, banks face a 42% skill gap in AI and data roles, meaning they must invest in training or hiring from a limited talent pool at high cost. For smaller banks, the upfront costs of AI (and uncertainty of immediate ROI) can be a deterrent. Even larger banks often find that AI projects require multi-year payback periods and substantial experimentation before yielding results. This can strain budgets and executive patience. Moreover, integrating AI into legacy systems can be complex and costly – many banks have siloed, outdated core systems that need upgrades or middleware for AI to work effectively, essentially raising the cost and difficulty of implementation. If not managed, these factors could widen the gap between big banks (that can afford AI at scale) and smaller institutions that lag, potentially reducing competition.

Data Privacy and Security Risks: AI's hunger for data means banks are collecting and utilizing more personal and sensitive information than ever. This raises privacy concerns – customers and regulators are worried about how data is used, whether AI might violate privacy norms (for instance, by inferring health or behavior patterns from spending data), and how securely data is stored. With cyber threats rising, AI systems themselves could become targets: if a criminal manipulates the data going into an AI model (a form of adversarial attack), they could potentially trick a fraud detection AI or loan approval AI to produce false negatives or positives. Additionally, many AI models are developed on cloud platforms or with third-party vendors, introducing third-party risk if those platforms are compromised. Data breaches in a highly AI-driven bank could be devastating, as so much customer data might be at stake. Ensuring robust cybersecurity and data protection is thus a crucial challenge. Banks must implement strong encryption, access controls, and monitoring around AI systems. They also have to navigate regulations like GDPR (in Europe) or

regional data localization laws (as in some GCC countries) that impose strict rules on data usage. Non-compliance can lead to heavy fines – for example, using customer data to train AI beyond the original consent scope might violate privacy laws. In summary, AI amplifies the importance of data governance and security in finance, and any lapse can erode customer trust and invite regulatory penalties.

Model Risk and Reliability: AI models can sometimes fail in unpredictable ways. “Hallucinations” (especially in generative AI) may produce entirely fabricated outputs that look credible, which is dangerous if a bank relies on them for advice or documentation. More generally, if an AI model is fed data outside the range of its training (say a sudden market shock), it might make poor predictions – potentially leading a bank to incorrect decisions (e.g. underestimating risk). Many AI models are also non-intuitive, finding patterns that humans might not spot. While this can be a strength, it becomes a weakness if the model picks up spurious correlations that don't hold in the long run, causing financial losses. For



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instance, an AI trading algorithm might overfit to a decade of bull market data and then perform terribly in a bear market. Banks therefore face model risk – the risk that the AI models themselves are wrong or misused. Incidents like the “flash crash” of 2010 were partly attributed to algorithms interacting in unforeseen ways, a reminder that wide deployment of AI in markets could increase volatility or systemic risk if not checked. Regulators are concerned that heavy reliance on a few AI models across many firms could lead to herding behavior, where everyone’s models make similar decisions (e.g. selling the same asset in a downturn), exacerbating crashes. To mitigate this, banks need rigorous testing, validation, and ongoing monitoring of AI models (so-called “model risk management” frameworks). They also often keep human oversight (“human in the loop”) for critical decisions to catch AI errors or intervene when needed. All of this adds complexity; unlike a static program, AI models may require constant tuning and governance, which is a disadvantage compared to simpler rules-based systems.

Regulatory and Compliance Challenges: The regulatory landscape around AI in finance is still evolving, creating uncertainty. Banks worry about how upcoming regulations might impact their AI projects. For instance, the EU’s draft AI Act proposes classifying credit scoring AI as “high risk,” which would mandate extensive documentation and human oversight, potentially slowing innovation. There’s also the issue that current laws like fair lending rules in the U.S. (e.g. the Equal Credit Opportunity Act) require lenders to explain adverse decisions to customers – a requirement at odds with black-box AI. Regulators could hold banks liable if their AI inadvertently discriminates or makes a decision that causes consumer harm. Banks, therefore, have to be cautious and sometimes limit their AI’s autonomy (e.g. using AI to assist, but a human makes the final call on a loan) to ensure compliance. Additionally, different jurisdictions have different rules, which complicates things for global banks. In summary, **regulatory compliance** in the age of AI is a moving target and can be seen as a disadvantage in that it introduces risk and potential costs (modifying or abandoning AI tools

that don’t meet regulatory expectations). Until regulatory frameworks catch up and provide clarity, some banks may tread slowly with AI in certain areas, potentially forgoing some benefits.

Cultural and Change Management Issues: Introducing AI into a centuries-old industry like banking also faces human and cultural hurdles. Employees may be resistant to trusting AI recommendations or fear that AI will make their expertise obsolete, leading to pushback or underutilization of the tools. Successful AI adoption often requires retraining staff and redefining job roles to work alongside AI (e.g. relationship managers using AI-generated insights to advise clients, rather than manually crunching data). This transition can be difficult and if mishandled, can result in poor implementation (the AI sits unused) or morale problems. Externally, some customers may also be wary of AI – for instance, high-net-worth clients might object to a “robot” managing their money versus a human advisor, or retail customers might be frustrated by chatbot interfaces if not designed well. Banks have to carefully manage these



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perceptions, often by maintaining a human touch in conjunction with AI (the “bionic bank” approach). Achieving the right mix of AI and human service, and earning buy-in from all stakeholders, is a non-trivial challenge that can slow down AI integration and dilute its advantages if not overcome.

In summary, while AI promises a smarter and more efficient financial system, it also **poses new risks** – ethical, operational, and systemic. Financial institutions must navigate these challenges through robust risk management, governance frameworks, and an emphasis on “responsible AI.” The GCC banking sector, as it accelerates AI adoption, has the opportunity to learn from global experiences and proactively address these disadvantages. The next section provides strategic recommendations for GCC banks to maximize AI’s benefits while mitigating its risks, taking into account the region’s unique environment.



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Strategic Recommendations for GCC Banking and Finance

Implementing AI successfully in the GCC's banking sector requires a strategic approach that leverages regional strengths and addresses local challenges. Below are key recommendations tailored for GCC financial institutions:

Invest in Talent Development and Skills: Bridging the AI skill gap is crucial. GCC banks should invest in training programs and “upskilling” their workforce in data science, machine learning, and AI product management. This could include partnering with local universities to create finance-specific AI courses or certifications, and launching internal AI academies for employees. Recruitment of specialized talent may be necessary in the short term, but over the long term cultivating local talent will reduce reliance on expensive foreign experts. For example, a leading GCC investment bank implemented an “AI for All” initiative providing AI training to all 5,000+ employees, ensuring widespread AI literacy across the organization. GCC

governments can support this by adjusting visa and education policies to attract and develop AI professionals. By building a strong human capital base in AI, banks will be better positioned to develop, validate, and manage AI solutions effectively.

Strengthen Data Infrastructure and Governance: Successful AI depends on high-quality data and secure infrastructure. GCC banks should enhance their data management capabilities – investing in data integration platforms, cloud computing (with appropriate on-premise or regional cloud setups to meet data localization laws), and real-time data pipelines. Ensuring robust cybersecurity and data privacy protections is non-negotiable, as customers and regulators will scrutinize how banks handle sensitive information. Banks should implement encryption, strict access controls, and continuous monitoring for all AI-related data stores. Additionally, establishing clear data governance policies (covering data ownership, consent, and usage rights) will help maintain trust. A well-governed data foundation not only reduces risks but also

improves AI model performance. GCC banks might collaborate via industry consortia to share threat intelligence on cyber risks to AI systems and to perhaps jointly develop anonymized data sets for training AI (e.g. a pooled fraud dataset across banks), as long as it respects competition and privacy rules.

Focus on High-Impact Use Cases and Measurable ROI: To justify the significant upfront investments, GCC banks should prioritize AI use cases that align with their strategic goals and show quick wins. Rather than attempting too many projects, identify a few “lighthouse” AI initiatives in areas like fraud detection, customer service automation, or personalized offers – where AI is mature and value can be realized in the short term. For example, implementing an AI fraud monitoring system can immediately reduce losses and pay for itself, as many GCC banks still contend with fraud, and AI has proven effective (with 84% adoption globally) in this domain. Similarly, deploying an Arabic/English chatbot for basic customer inquiries can cut call center volumes and improve customer satisfaction relatively quickly.



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It's important to define clear metrics (KPIs) for each AI project – e.g. reduction in processing time, increase in product cross-sell, lower default rates, etc. – and track them rigorously. This data-driven evaluation will help build the business case and buy-in for broader AI rollout. As ENBD's experience showed, measuring business impact (they used ML-based control groups to quantify uplift) was key to scaling AI efforts further. GCC banks should adopt a similar approach: start with contained projects, demonstrate ROI, and then expand AI gradually across the enterprise.

Embed AI in the Regulatory and Ethical Framework: GCC banks should be proactive in establishing governance for AI ethics and compliance. This means setting up internal guidelines or committees to oversee AI model development and deployment, ensuring they meet fairness, transparency, and accountability standards. For instance, banks can institute routine bias testing for AI models (e.g. check loan approval AI for disparate impact against protected groups) and maintain documentation to explain AI decisions as much as possible

(which will also prepare them for any future regulatory audits on AI). Engaging with regional regulators early is wise – for example, participating in central bank consultations or sandboxes on AI usage. The goal should be to shape and adhere to standards for “responsible AI” in finance. By doing so, GCC banks can avoid pitfalls seen elsewhere (such as public backlash or fines over AI-driven discrimination) and build trust among customers and regulators. On the ethical front, transparency with customers is key: banks might consider publishing plain-language disclosures about how they use AI (e.g. in making credit decisions or customizing services) and what data they use, giving customers confidence that there are safeguards against misuse. Some GCC banks have started including such statements in their annual reports or customer communications to highlight their commitment to ethical AI.

Leverage Partnerships and Ecosystem Collaboration: Given the fast pace of AI innovation, GCC banks should not go it alone in all cases. Partnering with fintech startups, global tech firms, and industry consortia can accelerate learning and

solution deployment. For example, a bank could partner with an AI fintech that specializes in Islamic finance compliance to quickly adopt AI for Shariah-compliant product screening. Collaborations with cloud providers like Microsoft, Google, or regional players (e.g. G42 in the UAE) can provide banks access to cutting-edge AI platforms and tools without having to build everything in-house. In fact, we see this happening: Abu Dhabi's sovereign fund and G42 launched a \$100B tech fund and are working with Microsoft on AI infrastructure – banks can tap into such ecosystems for mutual benefit. Participation in regulatory sandboxes (offered by central banks in Bahrain, Abu Dhabi, Saudi, etc.) allows banks to experiment with AI solutions in a controlled environment and share knowledge with regulators and peers. GCC banks could also collaborate amongst themselves on non-competitive fronts – for instance, sharing anonymized fraud data or jointly developing AI for cybersecurity – leveraging the principle that collective defense can be stronger (especially for smaller banks that might lack resources individually). By being active in the fintech and AI ecosystem,



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GCC banks can stay at the forefront of innovation and avoid reinventing the wheel.

Manage Change and Engage Stakeholders: As AI is introduced, banks should have a robust change management plan. This includes communicating clearly to employees about how AI will assist (not just replace) them, and providing training to use new AI tools. Involving staff in AI projects can turn them into champions rather than resisters – for example, include experienced loan officers in the development of an AI credit model so their domain knowledge is respected and they trust the outcome. Banks should also anticipate shifts in job roles and begin reskilling programs well before AI deployments cause disruptions. The goal is to create a culture where human-AI collaboration is embraced. To address customer concerns, emphasize the improved service aspects of AI (faster service, 24/7 availability, more tailored offerings) while reassuring that human help is still accessible for complex needs.

Maintaining a blend of “high-tech and high-touch” service is particularly important in the GCC, where relationship banking has traditionally been valued. For example, when deploying chatbots, a bank could clearly signal that live agents are a click away, and even use the chatbot to seamlessly schedule a call with a human advisor if needed – turning the AI into a complement rather than a barrier. By actively managing the transition – celebrating early AI successes internally, gathering feedback, and iterating – banks can reduce resistance to change and ensure AI initiatives deliver their intended value.

Adapt AI to Local Needs and Opportunities: GCC banks should customize AI solutions to leverage regional opportunities. This might mean ensuring AI services support Arabic language and dialects fluently (for chatbots, voice assistants, document analysis, etc.), which will greatly enhance customer experience for Arabic-speaking clients. Banks can work with AI providers

or invest in training models on Arabic datasets – an area sometimes underdeveloped compared to English AI capabilities. Additionally, consider the region’s high mobile penetration and youthful demographics: AI-driven mobile banking innovations (like payment bots in popular messaging apps or AI budgeting tools in mobile wallets) could see particularly strong adoption. Another opportunity is Islamic finance: AI can be used to verify Shariah compliance of contracts or transactions quickly, or even to create smart Islamic robo-advisors that construct Shariah-compliant investment portfolios. By focusing on such niche needs, GCC banks can differentiate themselves and better serve their customers. Governments are also investing in AI for broader economic diversification (e.g. AI in smart cities, AI for SME development); banks can align their AI projects with these themes, such as developing AI credit models to support SME lending (a priority in many GCC economies for growing the private sector).



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In conclusion, GCC banks stand to gain enormously from AI – boosting competitiveness and enabling them to offer world-class financial services – but they must do so **strategically and responsibly**. By investing in people and technology, embracing collaboration, and upholding ethical standards, banks in the GCC can navigate the AI revolution successfully. The journey involves careful balancing of innovation with risk management. If executed well, GCC financial institutions can become leaders in AI-enabled banking, driving both business success and positive economic outcomes in the region, all while managing the challenges inherent to this powerful technology.

Sources: The insights and data in this report are drawn from a variety of up-to-date sources, including industry case studies, academic research, and expert analyses. Key references include historical reviews of AI in finance, analyses of AI adoption by top U.S. banks, studies on China’s fintech and AI integration, reports on Middle East AI economic impact, and surveys of banks on AI usage and concerns, among others. These sources provide a foundation for understanding both the transformative potential of AI in banking and the precautions necessary to implement it effectively in different regional contexts. The recommendations for GCC banks synthesize best practices gleaned from these global insights, tailored to the regional ambitions and challenges documented in recent GCC-focused studies. By learning from global experiences while leveraging local strengths, GCC banks can chart a path that maximizes AI’s advantages and minimizes its risks in the coming years.



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