





Artificial Intelligence

Zenith Special Interest Group

Executive Primer



3 Types of Artificial Intelligence:

Weak Al

- Limited by programming won't develop new skills
- Analyses preferences and improves over time

Strong Al

- Learns new skills through contextualisation
- Applies knowledge to plan ahead
- Can adapt as changes occur

Superintelligence

- Self-aware
- Surpasses human intelligence
- Only exists in science fiction

Artificial Intelligence

Artificial Intelligence is revolutionizing the financial technology (fintech) industry, offering unprecedented opportunities and challenges alike. As a rapidly advancing branch of computer science, AI enables the simulation of human thought and language through code, with recent breakthroughs in machine learning and deep learning propelling the field's growth.

For fintech companies, embracing AI presents a pathway to stay competitive amid the increasing investments in AI innovation by big tech firms. However, alongside these opportunities, several critical challenges arise, demanding careful attention.



In this executive briefing, we will explore the key challenges facing the fintech industry as it harnesses the potential of AI. Specifically, we will examine the issues of bias in AI systems, the ethical implications of AI adoption, and the importance of addressing security and maintenance concerns for AI systems.

By addressing these challenges, fintech companies can pave the way for widespread and responsible adoption of AI tools, ensuring a safe, secure, and sustainable transformation of the financial services industry.

In the following sections, we will delve deeper into each challenge, highlighting the Zenith program's opportunities to assist fintech and financial services firms in overcoming these hurdles and unlocking the full potential of AI technology. In our appendices, we will brief you on the landscape of each underlying technology.



Key Highlights

- Al algorithms can inherit biases from the data they are trained on, leading to unfair and discriminatory outcomes.
- Identifying and mitigating bias in Al systems is crucial to building trust and ensuring ethical Al adoption.
- Biases in AI can have significant consequences in sensitive domains such as finance, impacting customer satisfaction and regulatory compliance.

Biases in Al Systems

Artificial Intelligence (AI) systems are prone to inheriting biases present in the data used for their training. Technologies such as **Data Annotation** and **Data Quality & Observability** play vital roles in identifying potential biases and ensuring that training data is diverse and representative. By incorporating these technologies, fintech companies can reduce the risk of biased AI outcomes and promote fairness in their algorithms.



By adopting **Synthetic Data** generating practices, fintech companies can broaden the training data sets to include more diverse demographics in their customer data to improve the quality of the data in.

To ensure ethical AI adoption, fintech companies should also invest in technologies that relate to **Model Validation & Monitoring**. These technologies help in understanding how AI models arrive at decisions, making the decision-making process more transparent and interpretable for customers and regulators.

To tackle biases effectively, fintech firms should adopt strategies such as **diverse and representative data collection**, **regular audits**, and **fairness-aware machine learning algorithms**. Transparency in Al decision-making can also aid in identifying potential biases and gaining customer trust.



Key Highlights

- Ethical considerations in AI adoption involve privacy, transparency, fairness, and accountability.
- Fintech companies must balance Al-driven innovation with societal and ethical responsibilities.
- Responsible Al practices enhance brand reputation and foster long-term customer loyalty.

Ethical Implications of Al Adoption

As fintech companies embrace Al-driven innovation, they must navigate the ethical implications associated with its adoption. Ethical considerations involve ensuring customer privacy, maintaining transparency in Al decision-making, promoting fairness in algorithms, and being accountable for Al-driven outcomes.

To address ethical concerns related to data privacy, fintech companies should implement **Data De-Identification** techniques. These technologies protect sensitive customer information while still allowing AI models to derive valuable insights.

Transparency and explain-ability are vital to address ethical concerns in AI adoption. Consumers and regulators are increasingly demanding explanations for AI-driven decisions. To enhance transparency, fintech firms should adopt <u>Interpretable AI</u> models and establish clear communication channels to explain the logic behind AI recommendations.

Fintech companies should acknowledge their responsibility for Al-driven outcomes and establish mechanisms to rectify errors and address customer complaints. Being accountable for Al systems' behaviour fosters trust and loyalty among customers and stakeholders.

Responsible AI practices not only align with societal values but also enhance the reputation of fintech companies. Customers are more likely to engage with companies that demonstrate a commitment to ethical AI practices, leading to long-term customer loyalty and sustainable growth.

Interpretable AI	Explainable Al
Small models that are inherently interpretable	The process of applying a method that models the output of a more
e.g. Small decision trees or linear	complex model
models with a small number of input variables	This is performed after model training has been completed



Key Highlights

- The integration of AI in fintech increases cybersecurity risks and potential vulnerabilities.
- Continuous monitoring and updates are essential to ensure the robustness and reliability of Al systems.
- Investing in AI security and maintenance is a proactive approach to safeguarding financial data and operations.

Security & Maintenance Concerns of Artificial Intelligence

While AI offers transformative opportunities for fintech, it also introduces new cybersecurity risks and vulnerabilities. The integration of AI in financial services creates potential entry points for cyber threats, necessitating a proactive approach to security and maintenance.

Technologies like **Resource Optimisation** and **Machine Learning Deployment** are essential in enhancing Al system robustness. These technologies ensure that Al models are efficiently deployed and managed, minimizing potential vulnerabilities and optimizing real-time resource usage.

Al can also play a pivotal role in fraud prevention and risk mitigation within fintech. Implementing Al-driven Fraud Detection systems enhances the security of financial transactions and improves overall risk management.

Considering the rapid evolution of cyber threats, fintech companies must stay informed about emerging security challenges and invest in state-of-the-art Al security technologies. Collaborating with industry experts and sharing insights on security best practices can further fortify fintech systems against potential threats.





Benefits of Exploration Through Zenith

- 1. Common frameworks for adoption can be crowdsourced
- 2. Reduce internal expertise limitations through community engagement
- 3. Time-to-market of exploration in innovation labs reduced
- 4. Reserve resources for high-value development
- 5. Interoperability improves adoption across the industry
- 6. Keep in step with security, standards, and new feature development
- 7. Benefit from community contributions across key themes
- 8. Empower, retain, and attract innovators and developers

Zenith Opportunities

12
Identified
Al Themes

In the Appendix, we have outlined 12 key themes that serve as innovation verticals within the Zenith program.

These themes encompass cutting-edge technologies and trends in Artificial Intelligence.

Embracing these themes will drive transformative advancements in fintech, fostering collaboration, and collective innovation within our foundation.

26
Identified
Blockers

We have identified 26 crucial blockers impeding the widespread adoption of Al technologies in the fintech industry. These will be posted on the Zenith site and repository.

To address these challenges, we call upon the wider development community to propose open source solutions through the Zenith program.

Together, we can leverage the power of collective expertise to overcome these obstacles and shape the future of Al-powered fintech solutions.

Join us in our mission to create secure, transparent, and ethical AI applications that redefine the financial services landscape.

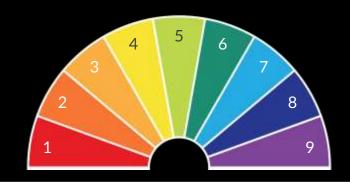


- Al Chipsets
- Al-Driven Fraud Detection
- Computer Vision
- Data Annotation
- Data De-Identification
- Data Quality & Observability
- Machine Learning Platforms & Deployment
- Model Validation & Monitoring
- Natural Language Processing
- Resource Optimisation
- Synthetic Data
- Version Control & Experiment Tracking

Appendices

Data Sheets

This report uses Technology Readiness Levels. For more information as to this classification system, please refer to https://zenith.finos.org/docs/roadmap/TRL





Al Chipsets

Specialized processors designed to accelerate Al computations, enabling faster and more efficient Al model training and inference.

In fintech, AI chipsets drive groundbreaking advancements, powering complex algorithms for fraud detection, risk assessment, and personalized financial recommendations.

The high-performance computing capabilities of AI chipsets empower fintech companies to deliver realtime, data-intensive services, transforming the way financial institutions operate and serve their customers.

You can find out more about this subject in our Al Chipset Primer on the Zenith GitHub.



OPPORTUNITY IMPACT TECHNICAL FEASIBILITY Network Effects Competitive Advantage Technical Merit Surging Demand & Interactions for applications Scalability of Al Success of Faster & more accurate decision making accelerated Al chipsets for high Integration across multiple Need for model training volume data processes Risk mgmt. & fraud detection capabilities Deep learning fast/efficient data Need for continuous upskilling to ensure advancements processing Real-time data processing for insights workforce proficiency Al-powered data analytics **DVIDIA** Tools, Ecosystem & Skills Players Financial Benefits Desire to enhance financial inclusivity & accessibility Availability of dev Optimised AI model training on chipsets **AMD** Growing ecosystem of service providers tools & frameworks Al-powers Fintech expands market reach Distruptees Need for continuous upskilling to ensure Google Increased investment for innovative startups chipsets are implemented correctly Legacy hardware manufacturers Supply Chain Friction Drivers Regulatory pressure to Traditional financial services improve fraud detection Integration Data storage and integration chipsets Data privacy requiring adaptation challenges with concerns legacy hardware Cost savings through Al-Collaboration with data/chipset manufacturers Skill shifts in job market as Al driven automation impacts workforce Regulatory compliance complexities Disruption to trad. hardware supply chains

FUTURE



Timeline

Short term Initial adoption and integration of chipsets Medium term
Widespread deployment
in financial services

Long term
Evolution of chipsets for autonomous solutions

Risks

Potential delays in advancements and innovations

Market resistance and scepticism in AI-decision making

Ethical considerations surrounding responsible

SUMMARY

Al chipsets offer a compelling opportunity for fintech, revolutionizing financial services through accelerated Al computations. Advancements in specialized hardware enable groundbreaking applications in fraud detection, risk assessment, and personalized financial recommendations. The high-performance computing capabilities of Al chipsets empower real-time, data-intensive financial services, transforming traditional banking and ushering in a new era of customer-centric financial experiences. Despite technical feasibility and potential financial benefits, challenges like data privacy, regulatory compliance, and integration frictions require careful navigation. With a promising future outlook, early adoption and collaboration between fintech players and Al chipset manufacturers will play a crucial role in shaping the trajectory of Al-driven fintech innovation.