The Future of Generative AI & AI as a Tool

Presented by:

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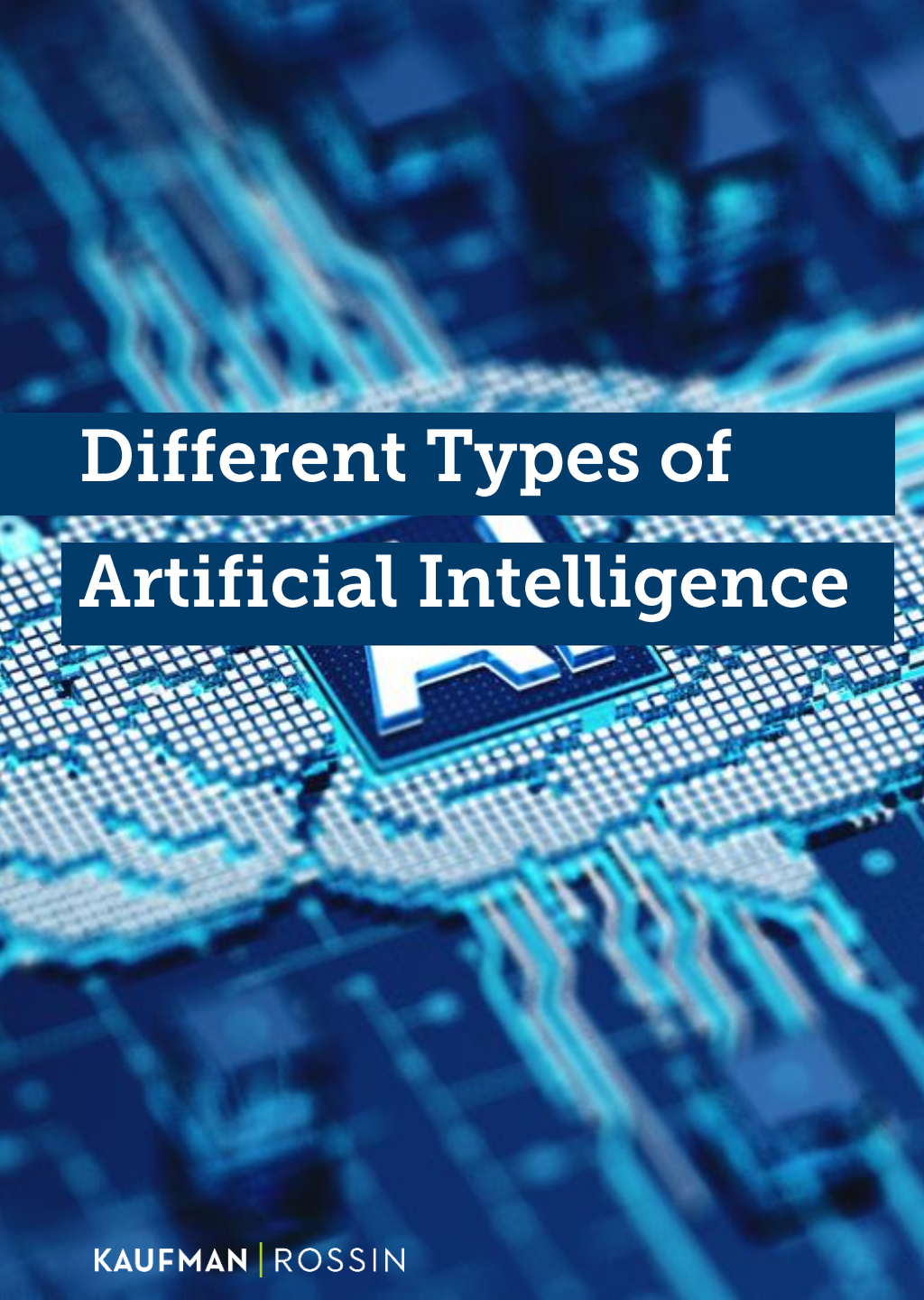
Agenda

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Artificial Intelligence "AI"

- The simulation of human intelligence processes by machines, especially computer systems.

- Technology that enables computers and machines to simulate human intelligence and problem-solving capabilities.

- A machine's ability to perform the cognitive functions we usually associate with human minds.

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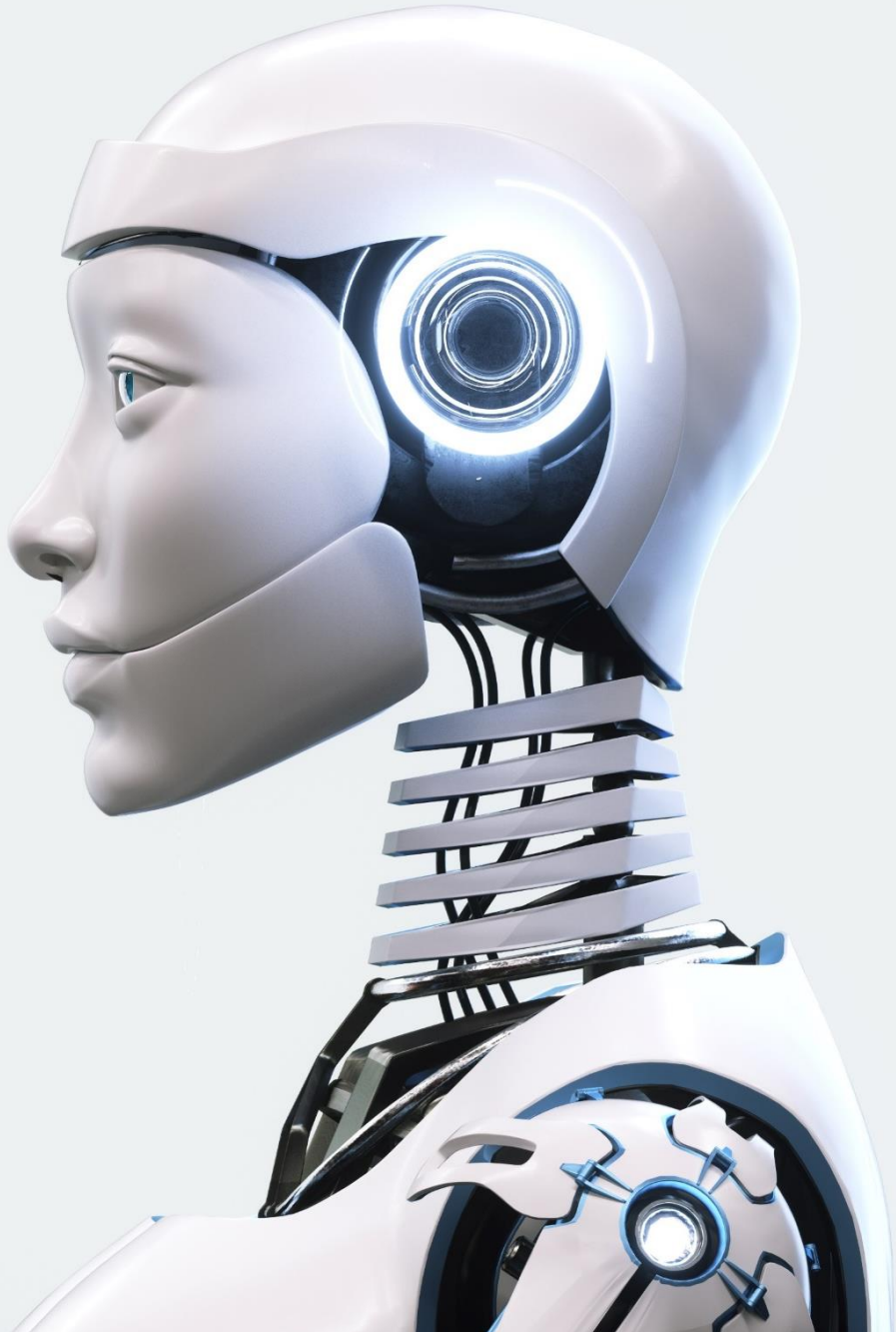
Do you speak Techlish?

- **Algorithm**: A step-by-step procedure for solving a problem of accomplishing some end, especially by a computer

- **Artificial Intelligence**: The development of computer systems able to perform tasks that normally require human intelligence

- **Machine Learning**: An application of artificial intelligence that provides systems the ability to automatically learn and improve without being explicitly programmed

- **Data Analytics**: The process of examining data sets in order to draw conclusions about the information they contain, increasingly with the aid of specialized systems and software

Different Types of Artificial Intelligence

- Reactive (e.g., Deterministic AI)

- Limited Memory (e.g., Probabilistic, Generative AI)

- Theory of Mind (i.e., Understand human emotions)

- Self-Aware (e.g. Terminator, the Matrix)

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Reactive / Deterministic AI

Systems with no memory and are designed to perform a very specific task.

Since they can't recollect previous outcomes or decisions, they only work with presently available data.

Reactive AI stems from statistical math and can analyze vast amounts of data to produce a seemingly intelligence output.

Example:
The Netflix Recommendation Engine is powered by models that process data sets collected from viewing history to provide customers with content they're most likely to enjoy

Limited Memory Probabilistic / Generative AI

Can use past- and present-moment data to decide on a course of action most likely to help achieve a desired outcome.

Generative AI is a type of "limited memory AI," which means that it is trained on a set of data and makes its predictions by using statistical analysis upon said data.

Examples:
- Generative AI – ChatGPT relies on limited memory AI capabilities to predict the next word, phrase or visual element within the content it's generating.

- Chatbots - combine natural language processing (NLP) and Limited Memory AI to understand questions and requests, take appropriate actions and compose responses

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Generative AI Concerns

- Hallucinations
- False Answers
- Bias

Prompt engineering is a skill. The more a prompt is fine tuned, the more reliable the output will be.

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Theory of Mind AI

A system capable of understanding human thought processes and emotions. This understanding can affect how the AI interacts with those around them. In theory, this would allow the AI to simulate human-like relationships.

Emotion AI is a theory of mind AI currently in development. AI researchers hope it will have the ability to analyze voices, images and other kinds of data to recognize, simulate, monitor and respond appropriately to humans on an emotional level.

Potential Applications:
- Personalized assistance for individuals with disabilities (an AI-powered wheelchair)

- Improved Customer Service by providing more personalized and empathetic interactions. (AI-powered chatbot)

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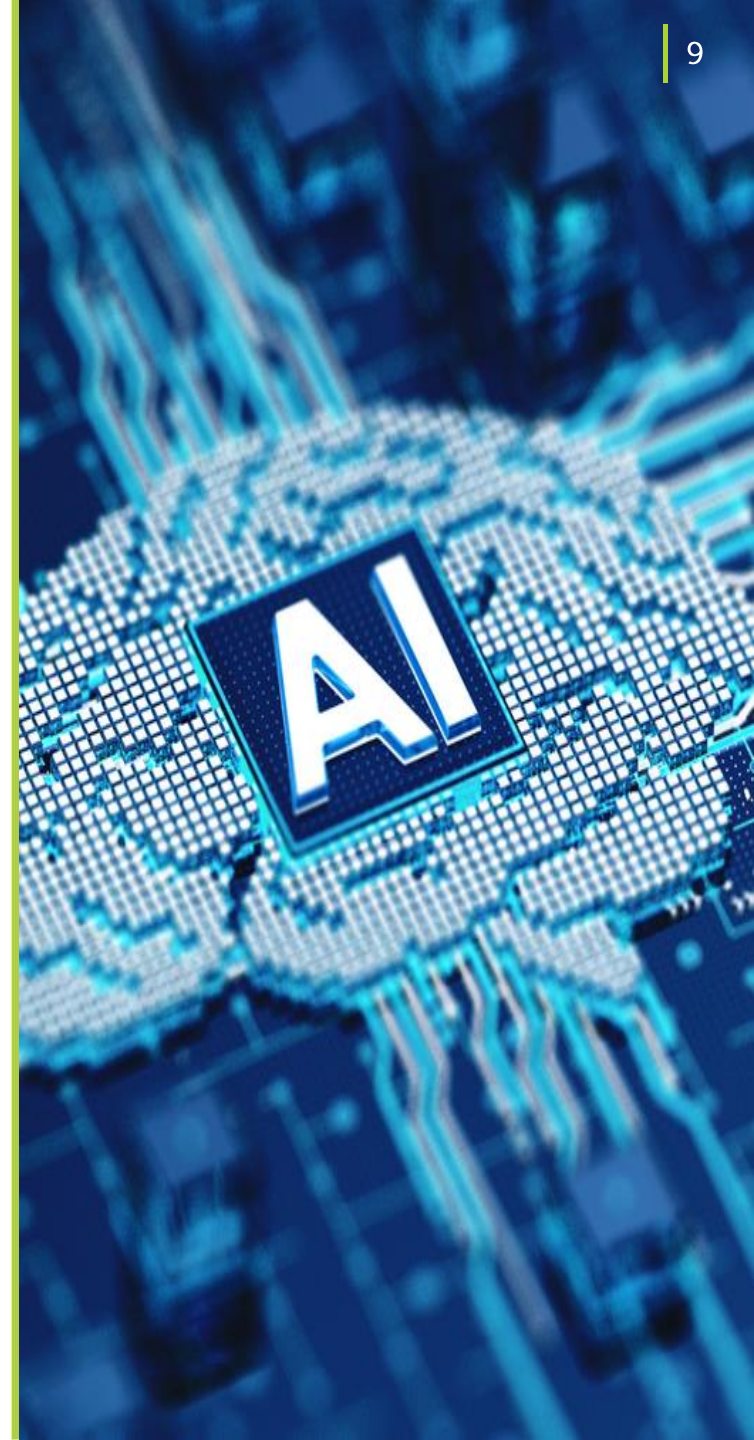
Artificial General Intelligence (AGI)

A field of theoretical AI research that attempts to create software with human-like intelligence and the ability to self-teach.

https://openai.com/blog/planning-for-agi-and-beyond

OpenAI

Research ⌄   API ⌄   ChatGPT ⌄   Safety   Company ⌄

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Authors
Sam Altman ↓

Safety & Alignment

Our mission is to ensure that artificial general intelligence—AI systems that are generally smarter than humans—benefits all of humanity.

If AGI is successfully created, this technology could help us elevate humanity by increasing abundance, turbocharging the global economy, and aiding in the discovery of new scientific knowledge that changes the limits of possibility.

AGI has the potential to give everyone incredible new capabilities; we can imagine a world where all of us have access to help with almost any cognitive task, providing a great force multiplier for human ingenuity and creativity.

On the other hand, AGI would also come with serious risk of misuse, drastic accidents, and societal disruption. Because the upside of AGI is so great, we do not believe it is possible or desirable for society to stop its development forever; instead, society and the developers of AGI have to figure out how to get it right.[A]

Although we cannot predict exactly what will happen, and of course our current progress could hit a wall, we can articulate the principles we care about most:

1. We want AGI to empower humanity to maximally flourish in the universe. We don't expect the future to be an unqualified utopia, but we want to maximize the good and minimize the bad, and for AGI to be an amplifier of humanity.

2. We want the benefits of, access to, and governance of AGI to be widely and fairly shared.

3. We want to successfully navigate massive risks. In confronting these risks, we acknowledge that what seems right in theory often plays out more strangely than expected in practice. We believe we have to continuously learn and adapt by deploying less powerful versions of the technology in order to minimize "one shot to get it right" scenarios.

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Self-Aware AI

This would be for applications that would possess super AI capabilities. It is strictly theoretical. If ever achieved, it would have the ability to understand its own internal conditions and traits along with human emotions and thoughts. It would also have its own set of emotions, needs and beliefs.

Potential Benefit:
- Better understanding of the human mind: Could help scientists better understand cognitive processes. This could lead to significant advancements in psychology and neuroscience.

- Advances in human-machine interaction: It could better understand human emotions and intentions, facilitating communication and collaboration between humans and machines.

- Self-improvement of AI: A self-aware AI could potentially self-improve and evolve autonomously. This could lead to accelerated advancements in AI itself as it continuously learns and adapts.

The "Future" of AI is here

- AI in Banking is not a future goal...it is the current reality. It has been implemented worldwide.

- AI is becoming the tool for achieving better efficiency, process automation, business effectiveness, better productivity, and more.

- The benefits of AI in banking is that it gives companies a competitive advantage and help them make essential breakthroughs in improving user experience.

- What used to take hours for an employee to do, now takes minutes and even seconds for AI to accurately complete.

- The future of banking is promising if financial institutions implement AI-powered service customizations, personalized product recommendations and notifications, and offer AI-powered 24/7 client support.

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Embrace the Change

Because AI has proven to effectively reduce workload and company costs, many people tend to fear that AI is a threat to their roles at work.

The tasks usually done manually (password resets, report generation, financial inquiries) can be assigned to a machine.

The current stage of technological growth does not allow machines to become independent and self-controlled. Although AI can take over a lot of work done by humans, it still needs human guidance, control, and management.

Use of AI allows people to be free from mundane tasks and creates space for creativity, critical thinking and innovation. It assigns many new responsibilities and roles.

Benefits and Uses for AI in Banking

Enhanced Regulatory Compliance

AI systems can be trained to interpret and analyze vast amounts of regulatory data, facilitating real-time compliance monitoring and reducing the risk of non-compliance.

Fraud Detection and Prevention

Machine learning models can continuously analyze transaction data, identifying suspicious activities and potential fraud in real-time.

Personalized Customer Experiences

By leveraging customer data and preferences, AI algorithms can offer tailored product recommendations, personalized financial advice, and customized services.

Chatbots and Virtual Assistants

These intelligent systems can handle routine inquiries, provide account information, and even guide users through complex processes.

Uses & Benefits Examples

Use Case	Deterministic AI	Probabilistic / Generative AI
Customer Support	Customers can use AI powered chatbots to receive high quality customer support 24/7.	Same concept – but can provide more reliable & specific responses to customer needs.
Fraud Detection & Prevention	Customer can be automatically notified if suspicious activity is detected on their account. AI can also be used to request and process confirmation of those actions.	Can generate SARs based on customer and transaction information.
Loan Application Management	Chatbots can be the starting point for an applicant applying for a loan. Only after AI checks the application will it go to the Bank for a human review	Following a credit decision, it can draft the credit memo and contract.

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Implementation of AI Use in Banking

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- Before AI can be integrated into a process, that process must first be digitized.

- Digitization involves converting analog or paper-based processes into digital formats. It is the process of taking existing manual or paper-centric tasks and transforming them into electronic or computer-readable formats.

- The primary goal of digitization is to streamline processes, reduce reliance on physical paperwork, and enhance operational efficiency. It focuses on making information more accessible, searchable, and easily transferable within the organization.

- Digitizing processes can lead to cost savings, faster transaction processing, improved accuracy, and enhanced customer experience. It is a foundational step towards modernizing banking operations.

Step 1: Digitizing a Banking Process

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Step 2: Integrating Artificial Intelligence

- Adding AI to a banking process involves incorporating advanced algorithms and machine learning capabilities to perform tasks that traditionally required human intelligence.

- The primary goal of integrating AI is to enhance decision-making, automate repetitive tasks, and derive insights from large datasets. It goes beyond digitization by enabling systems to learn, adapt, and improve over time without explicit programming.

- The integration of AI into digitized processes allows for adaptability and responsiveness to changing needs, regulatory requirements, and market dynamics. It enables banks to evolve their services and stay ahead in a dynamic financial landscape.

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KR Use Case: Reg E Disputes QA

- More and more financial institutions are partnering with fintechs to offer card products (debit, prepaid, gift cards, etc) to consumers.

- Many of these fintechs receive a high volume of consumer Reg E disputes due to the high volume of cards issued as well as a high volume of fraud.

- Many of these financial institutions have found that they do not have the manpower needed in house to conduct adequate oversight and ongoing monitoring of their fintech partners to ensure consumer disputes are consistently being handled in accordance with Regulation E requirements.

- KR is in the process of developing a digitized platform that handles the quality assurance process for Reg E disputes from end to end (population report, sample selections, testing, observations, and reporting).

- The platform will utilize AI to conduct the transaction testing. The AI will review the supporting documents and complete the testing attributes based on that support. KR employee will review the results for accuracy.

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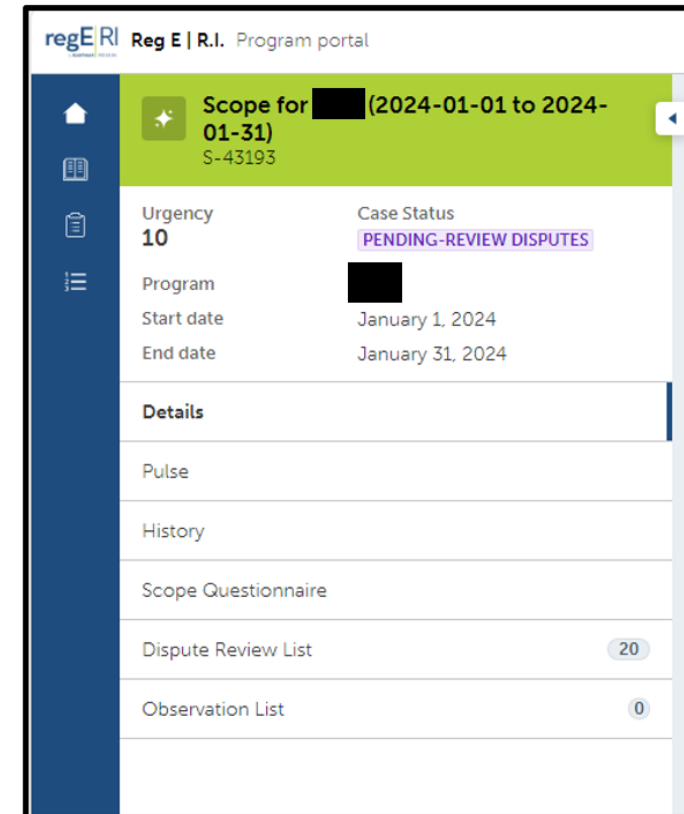
Mitigating Challenges of AI Use in Banking

Security of Customer Data

Financial Institutions obtain and manage individuals private personal and financial information.

AI systems rely heavily on data, and the use of sensitive customer information poses a risk if not adequately protected. Unauthorized access or data breaches can result in severe consequences for both the bank and its customers.

- The AI-powered solution should be wisely chosen by a professional team experienced in AI development.

- Implement robust encryption techniques to secure data in transit and at rest.

- Ensure your partners adhere to stringent data privacy regulations and ensure compliance with industry standards.

- Ensure your partners conduct regular security audits and assessments to identify and address vulnerabilities.

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Many AI models operate as "black boxes," making it challenging to understand the reasoning behind their decisions.

Lack of transparency can result in inability to evidence adherence to regulatory requirements.

- Choose AI models that offer explainability features, enabling users to understand the decision-making process (e.g., "Response Rational").

- Implement transparency measures in communication with customers and regulators about how AI is used in banking operations.

- Ensure fintech partners that use AI models have the ability to explain and demonstrate the models reasoning and decisions.

Explainability and Transparency

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Bias and Fairness

AI models may inadvertently perpetuate biases present in historical data, leading to unfair or discriminatory outcomes.

This can result in ethical concerns and potential legal implications.

- Regularly audit AI models for biases and fairness by assessing the training data and model outputs.

- Implement transparency measures to understand how decisions are made and ensure accountability.

- Engage diverse teams during the development process to identify and address potential biases.

Operational Risk

Overreliance on AI without proper fallback mechanisms or contingency plans may lead to operational disruptions if the technology fails.

- Establish comprehensive contingency plans to handle AI system failures, ensuring a smooth transition to manual processes if necessary (BCP & DR plans).

- Conduct regular testing and simulations to identify potential points of failure and address them proactively.

Model Robustness & Accuracy

Inaccurate predictions or unreliable models can lead to financial losses, incorrect decisions, and damage to the Bank's reputation.

- Continuously monitor and evaluate the performance of AI models, updating them regularly with new and relevant data.

- Implement model validation processes to ensure accuracy and reliability before deploying AI in critical functions.

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Employee Skills & Training

Lack of expertise among employees in understanding, managing, and overseeing AI systems may hinder effective risk management.

- Ensure the employees involved in development, testing and implementation of AI processes have the experience and knowledge needed to ensure effectiveness and compliance.

- Invest in employee training programs to enhance AI literacy and awareness.

- Foster a culture of continuous learning and collaboration between technical and non-technical teams.

- Work with trusted partners who specialize in AI application.

Recent Industry Observations

- Many clients are still in the process of establishing data governance.

    - Authority, control, and decision making around data may not be uniformly established for the environment.

    - Data cataloging (mapping and indexing sources, usage, lineage) may be undefined.

    - Data owners and data stewards may not be explicitly identified.

- Information security and IT operations teams may not have effective communications with compliance teams.

- Data security is often established and reviewed but may not be optimized.

- Immaturity in data governance may delay innovation and growth.

- COVID-19 drew additional attention to weaknesses in data governance by disrupting processes and environments.

- Skills shortages may be exacerbating the problems.

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- Machine learning can be utilized to create alternative *challenger* models used in benchmarking against *champion* models.

- *"The most effective challenger benchmark models are those that implement a different methodology from that of the champion."*

- Benchmark models used solely for validation need to also be validated. An assessment of the benchmark models and related data should be done to ensure they provide reasonable comparisons.

- The determination/decision on when to replace a primary model with a challenger benchmark model if it is a better performing model.

Recent Advancements In ML & AI in Model Validation

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Current Pain Points & Challenges

Challenges in Money Laundering	Deficiencies in Rule Based Systems
Data spread across multiple systems/silos	Manual analysis by the investigators – time consuming
Data quality issues	One-size-fit-all policy doesn't always work
Inability of systems to track hidden, multi-channel and complex patterns of transactions	Subjective and inconsistent. Rules based system cannot identify hidden ML patterns
Large # of false positives	Ineffective detection routines
Operational inefficiencies	Efforts to manually set thresholds and train employees periodically result in significant time and cost

AI/ML – What It's About

How Does it Help?	AI/ML Terminology
Understand behavior and flag anomalies	Supervised & Unsupervised Machine Learning
Connects the Dots	Model Types - Naive Bayes, Decision-Tree, Regression, Random/Isolation Forests, Gradient Boost, Neural Networks, Clustering
ML Use Cases - Sanction Screening, Adverse Media Screening, Case Investigation, Alerts Suppression, Alerts Assignment to Investigators	Compare Model Performance - Choose Optimal Model for your requirement
Fraud Monitoring - Identification of Fraud Scenarios/ New Patterns	Natural Language Processing - Screening of Payments/ ACH
Increase Efficiency	Pluggable Architecture to support additional third-party machine learning libraries
Robotic Process Automation – Faster & Automated	Use of R and Python

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When is Machine Learning Not Needed?

- Knowledge model is highly developed across cases

- Knowledge model rarely needs changes

- Data is highly reliable

- Data is highly available

Analytics – AI/ML

1

False Positive Reduction

Uses Historical Data & Combination of Customer & Alerts Risk

2

Alert Risk Scoring

Alert Prioritization Metric based on combination on historical data and alert parameters

3

Customer Profiling

Understands customer transaction patterns based on historical patterns across multiple dimensions

4

Clustering & Outlier Analysis

Customer segmentation by peer grouping and identification of outliers

5

Trend Analysis

Gives insight on the transaction patterns followed by customer-based historical data

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Adoption of AI/ML within an Organization

Reasons to Adopt	Factors Fighting Against
Balancing operations with regulatory expectations of systems/controls	Bureaucratic overhead
On-going reduction of false positives	Budgetary constraints
Real-time payments and globalization	Data privacy and sensitivity
Move to Cloud computing	Shortage of skillsets and resources
Reduction in cost of data storage	Transparency on explainable outcomes
	Spanning data internal and external to an enterprise and across silos

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Key Takeaways

- Consider stacking (RPA for data pulling, ML for comparing data to stated patterns, AI for SAR/NSAR decision (auto-filing)

- Don't attempt a home run on the first pitch at bat; rather, just get on base

- Even one successful BOT data pull counts; a small victory is still a victory

- **RPA, ML, AI – Flipping the 3 AML Ratios**

- False Positive Ratio – 95% of alerts are false positives ... flip that to 5% false positives

- Forgotten SAR Ratio – only 20% of SARs have Tactical or Strategic Value ... flip that to 80% of SARs with "TSV"

- Analyst's Time Ratio – 90% of an Analyst's time is spent gathering information and 10% investigating ... flip that to 10% gathering of information and 90% investigating

- Even if ML models perform better than traditional models, the lack of explainability may cause ML/AI models to be restricted in use by model validation and MRM teams

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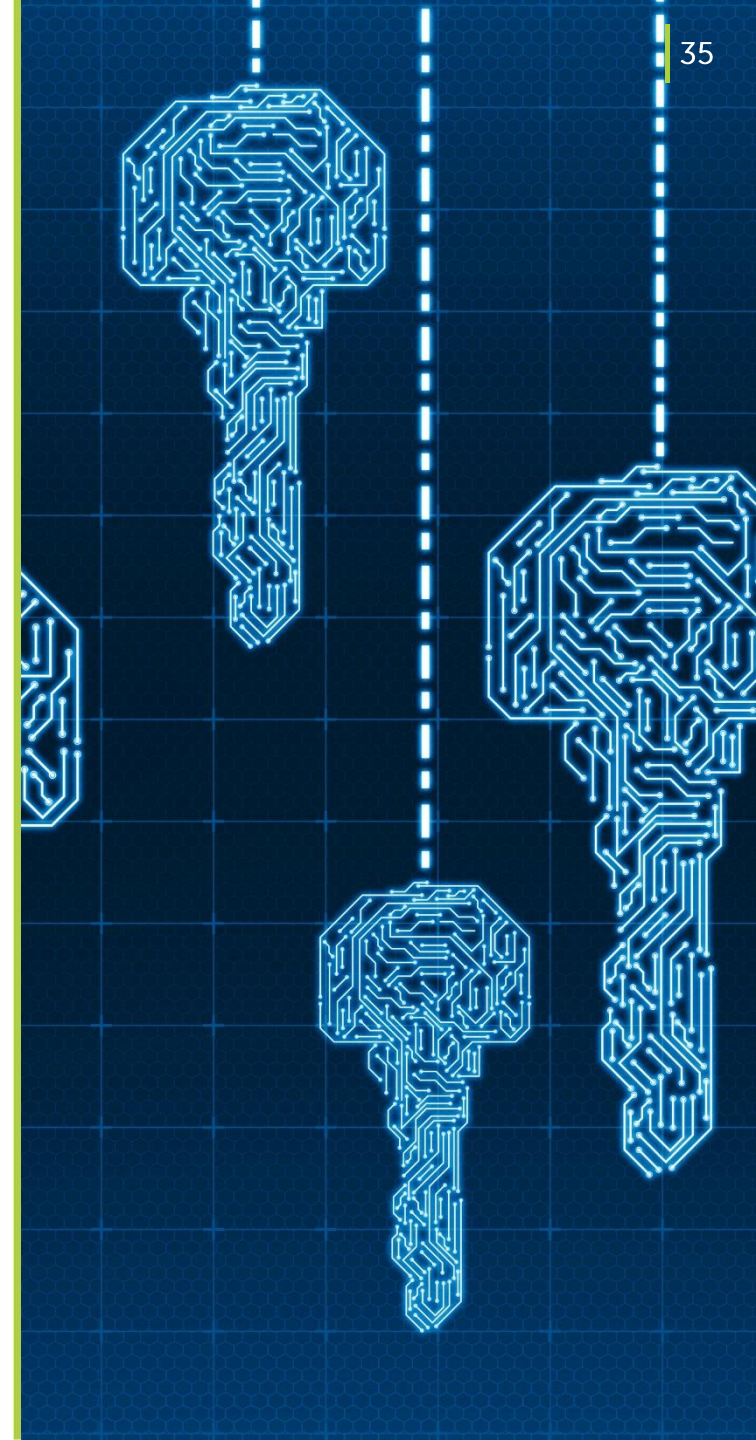
Conclusion

AI is changing every day

As AI continues to evolve, its role in shaping the future of banking will be pivotal, providing not only operational efficiencies but also a foundation for building stronger, more secure, and customer-centric financial ecosystems.

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Questions?

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