**Summary of AI Application to MasterCard and Visa Payment Services**

MasterCard and Visa utilize AI in their Fraud Risk Management systems to predict, prevent, and manage payment scams.

**MasterCard** has developed an AI-powered ‘Consumer Fraud Risk’ solution that uses large-scale payments data to identify real-time payment scams before funds leave a victim’s account. The system traces the flow of funds through mule accounts used by organized criminals and provides banks with the intelligence necessary to intervene in real time and stop a payment before funds are lost. MasterCard also uses deep learning algorithms for fraud detection, anomaly detection, and data analysis.

**Visa** uses AI in its Visa Advanced Authorization (VAA) system, a comprehensive risk management tool that monitors and evaluates transaction authorizations on the Visa global payment network, VisaNet, in real time. It helps financial institutions promptly identify and respond to emerging fraud patterns and trends. Visa’s AI analyzes 100% of the transactions processed on VisaNet, each in about one millisecond, allowing financial institutions to approve legitimate purchases while quickly identifying and preventing fraudulent transactions.

Both companies face challenges due to a rise in cybersecurity threats, an expanding and diversifying payments ecosystem, and greater regulatory requirements. Fraudsters have shifted their focus to impersonation tactics, convincing people and businesses to send them money, thinking the transfer is to a legitimate person or entity. This type of fraud, often referred to as authorized push payment fraud or APP fraud, now accounts for 40% of U.K. bank fraud losses and estimates predict it could cost $4.6 billion in the U.S. and U.K. alone by 2026.

Generative AI has a wide range of applications in companies like MasterCard, Visa, and PayPal. MasterCard uses generative AI to create synthetic fraud transaction data to evaluate weaknesses in a financial institution’s systems and spot red flags in large datasets relevant to anti-money laundering. Visa sees generative AI as a transformative force in the world of commerce and payments, enabling faster access to critical information, better decision-making, and unlocked potential. PayPal is using generative AI to investigate fraud and improve customer experience, drive operational efficiency, and help create a more customer-centric business.

**MasterCard and Visa: AI in Payment Services**

* **MasterCard**
  + Uses AI to predict and prevent payment scams.
  + Developed an AI-powered ‘Consumer Fraud Risk’ solution.
  + Solution uses large-scale payments data to identify scams in real time.
  + Follows the flow of funds through mule accounts used by criminals.
  + Provides banks with intelligence to intervene and stop a payment before funds are lost.
  + Uses deep learning algorithms for fraud detection, anomaly detection, and data analysis.
  + Uses generative AI to create synthetic fraud transaction data and spot red flags in large datasets.
* **Visa**
  + Uses AI in its Visa Advanced Authorization (VAA) system.
  + VAA monitors and evaluates transaction authorizations on VisaNet in real time.
  + Helps financial institutions identify and respond to emerging fraud patterns and trends.
  + Analyzes 100% of the transactions processed on VisaNet in about one millisecond.
  + Allows financial institutions to approve legitimate purchases and prevent fraudulent transactions.
  + Sees generative AI as a transformative force in commerce and payments.
* **Challenges**
  + Rise in cybersecurity threats, expanding payments ecosystem, and greater regulatory requirements.
  + Fraudsters have shifted focus to impersonation tactics.
  + Authorized push payment fraud (APP fraud) accounts for 40% of U.K. bank fraud losses.
  + APP fraud could cost $4.6 billion in the U.S. and U.K. alone by 2026.

**Enza Global Orchestration Services and AI Applications**

Enza Global offers a range of orchestration services, each with potential applications for AI:

1. **Merchant Management**: Enza uses video KYC (Know Your Customer) and AML (Anti-Money Laundering) integration to onboard new merchants. AI can enhance this process through Generative AI, creating personalized offers for customers, and Computer Vision, enabling biometric authentication during onboarding.
2. **Payment Processing**: Enza processes various types of payments. Time Series Forecasting can optimize transaction routing based on factors like transaction fees, geolocation, and customer payment method preferences.
3. **Risk Management**: Enza integrates with Express Pay and Trident to offer secure transactions and fraud prevention. Anomaly Detection can identify suspicious transactions, behaviors, or devices, and Supervised and Unsupervised Classification and Regression can classify customers and merchants into different risk levels.
4. **Global Services**: Enza supports 90 currencies and offers multi-currency processing. Graph Networks can help build and manage payment ecosystems, connecting and coordinating multiple PSPs, banks, and regulators.
5. **Switch/ Connectivity**: Enza owns its own VAP (Visa Access Point) and MIP (Mastercard Interface Processor). RLHF (Reinforcement Learning with Hindsight Feedback) can automate and optimize payment orchestration by learning from customer feedback, transaction data, and market conditions.
6. **Value Added Services**: Enza provides in-built 3DSS (3-D Secure Service) and MPI (Merchant Plug-In). Generative AI can create personalized offers for customers, and Computer Vision can enable biometric authentication.
7. **Recon, Reporting & Settlement**: Enza performs N-way reconciliation and handles staging, settlement, dispute, chargeback, and reports. Clustering can segment and target customers and merchants, offering them tailored payment solutions. Supervised and Unsupervised Classification and Regression can predict customer churn and retention.

In summary, AI has the potential to significantly enhance Enza’s orchestration services, from improving customer experience through personalized offers to optimizing transaction routing and enhancing security measures. The goal is not just to automate existing processes, but to use AI to enhance these processes and deliver better outcomes.

**Enza Global Orchestration Services and AI Applications**

* **Merchant Management**
  + Onboards new merchants using video KYC and AML integration.
  + AI Applications: Generative AI for personalized offers, Computer Vision for biometric authentication.
* **Payment Processing**
  + Processes various types of payments.
  + AI Applications: Time Series Forecasting for optimizing transaction routing.
* **Risk Management**
  + Offers secure transactions and fraud prevention with Express Pay and Trident.
  + AI Applications: Anomaly Detection for identifying suspicious transactions, Supervised and Unsupervised Classification and Regression for risk level classification.
* **Global Services**
  + Supports 90 currencies and offers multi-currency processing.
  + AI Applications: Graph Networks for building and managing payment ecosystems.
* **Switch/ Connectivity**
  + Owns VAP and MIP for Visa and Mastercard networks.
  + AI Applications: RLHF for automating and optimizing payment orchestration.
* **Value Added Services**
  + Provides in-built 3DSS and MPI, offers features like vault, tokenization, one-click user experience, same day settlements, instant refunds, and payment links.
  + AI Applications: Generative AI for personalized offers, Computer Vision for biometric authentication.
* **Recon, Reporting & Settlement**
  + Performs N-way reconciliation and handles staging, settlement, dispute, chargeback, and reports.
  + AI Applications: Clustering for customer segmentation, Supervised and Unsupervised Classification and Regression for predicting customer churn and retention.

**AI Implementations in Payment Processing**

AI has been instrumental in transforming payment processing. Here’s a summary of how some major companies are leveraging AI:

* **PayPal**: Uses deep learning for fraud detection and natural language processing for customer service.
* **Mastercard**: Employs neural networks for transaction processing, network optimization, and personalized services.
* **Stripe**: Applies machine learning for automating tasks like invoice generation, tax calculation, and reconciliation, and improving risk management and compliance processes.
* **Square**: Utilizes computer vision for contactless payments and AI for value-added services like marketing campaigns and customer behavior analysis.

However, the application of AI in payment processing also faces challenges:

* **Bias in AI algorithms**: Can lead to unfair treatment or inaccurate predictions. Mitigation strategies include using diverse datasets, ensuring algorithm transparency, and regular testing and validation.
* **Privacy and security concerns**: AI’s data-intensive nature can lead to vulnerabilities. Companies need to prioritize cybersecurity and comply with data privacy regulations.
* **Lack of standardization**: Incompatibility between AI systems can result in inefficiencies. The establishment of industry-wide standards and protocols is necessary.
* **Ethical concerns**: AI decisions can impact people’s financial lives, raising questions of accountability. Companies need to adhere to ethical principles and allow for human oversight.

For Enza to address bias in its AI algorithms, it can:

* Use diverse and representative datasets.
* Apply techniques like fairness-aware learning, adversarial debiasing, and counterfactual reasoning.
* Regularly test and validate the AI algorithms using metrics like equalized odds, equal opportunity, and demographic parity.
* Provide transparency and explainability for the AI algorithms.
* Engage in ethical conversations with stakeholders about potential bias sources and impacts.
* Invest in diversifying the AI talent and teams, fostering a culture of inclusion and accountability.

**AI in Payment Processing**

* PayPal:
  + Uses AI for fraud detection and customer service.
* Mastercard:
  + Employs AI for transaction processing, network optimization, and personalized services.
* Stripe:
  + Applies AI for task automation and risk management.
* Square:
  + Utilizes AI for contactless payments and value-added services.

**Challenges in AI Implementation**

* Bias in AI algorithms:
  + Can lead to unfair treatment or inaccurate predictions.
* Privacy and security concerns:
  + Vulnerabilities due to AI’s data-intensive nature.
* Lack of standardization:
  + Incompatibility between AI systems can result in inefficiencies.
* Ethical concerns:
  + AI decisions can impact people’s financial lives.

**Addressing Bias in AI Algorithms**

* Use diverse and representative datasets.
* Apply techniques like fairness-aware learning, adversarial debiasing, and counterfactual reasoning.
* Regularly test and validate the AI algorithms.
* Provide transparency and explainability for the AI algorithms.
* Engage in ethical conversations with stakeholders about potential bias sources and impacts.
* Invest in diversifying the AI talent and teams.