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Office of the Vice Provost for Advances in Learning



## **Harvard FinTech Online short course**

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**Problem number and title: Problem 1: The Road to a US Digital Dollar**

Please use this template to create your presentation.

Click on “New Slide” in the Home toolbar to add slides to this template. Please feel free to reformat this template as much as you would like. Once you’ve finished creating your slide deck, upload it to the Online Campus along with your capstone project document in Module 6.

Your slide deck should contain 10–15 slides (excluding this cover page) with the following information:

- Description of your chosen FinTech problem;
- Relevant descriptors, graphics and other visuals to expand/clarify your problem; and
- A proposed solution.

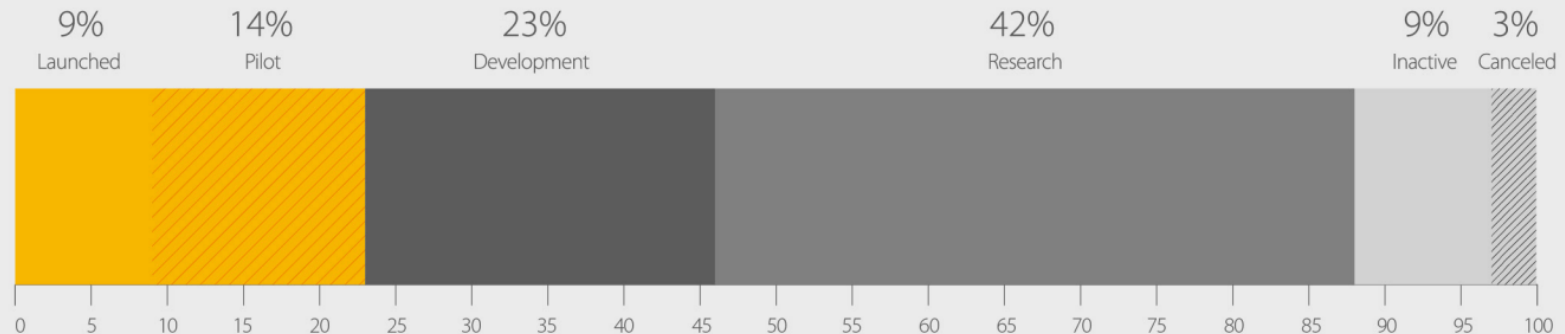


## CBDC Revolution: A Global Movement Towards Implementation

- Roughly 90% of central banks across the world are now exploring CBDCs
- 60% of them are conducting pilots or proof of concepts

Over 100 central banks are exploring CBDCs as of May 2022

### CBDC progress



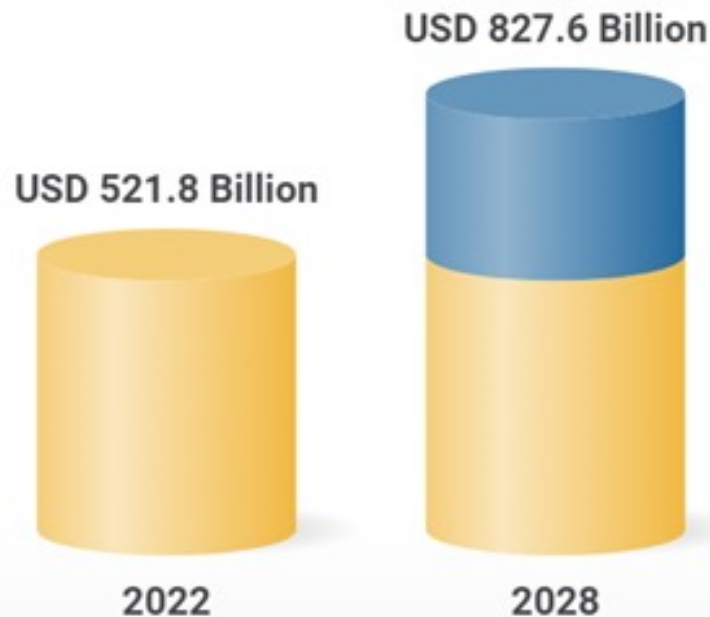
Source: The Atlantic Council CBDC tracker, which includes inputs from Bank of International Settlements, International Monetary Fund, and the John Kiff Database



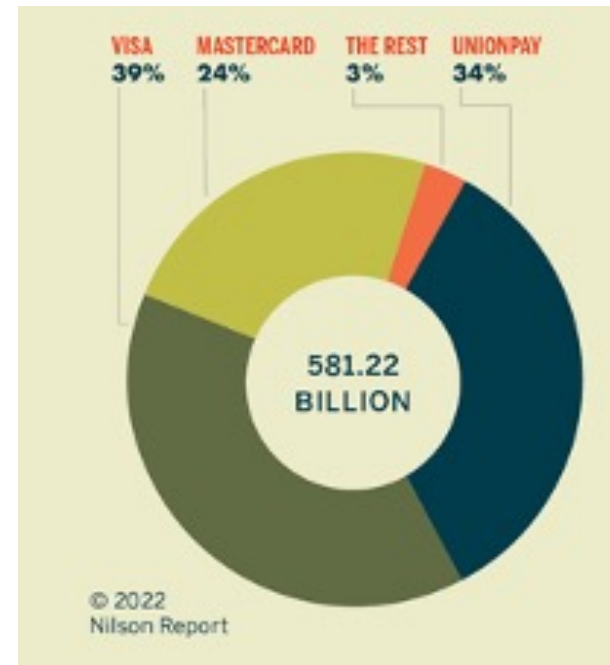
## Visa's Current Positioning In The Global Payment Market

### Global Credit Card Payment Market

Market forecast to grow at a CAGR of 8.0%



Visa leads the payment cards market, with a 39% market share in purchase transactions.



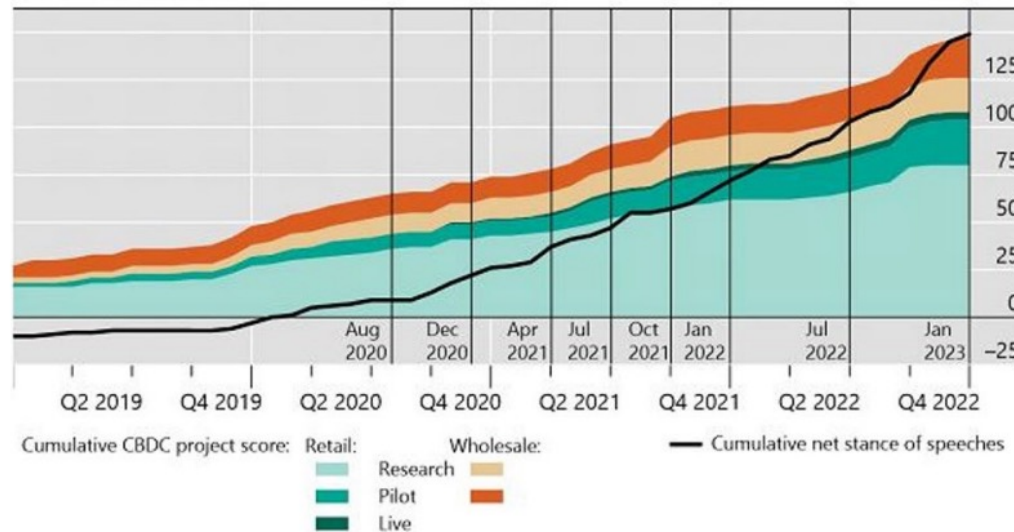
Source: Research and Markets/Nilson Report



## Embracing CBDC: Why Should Visa Be Strongly Prepared?

Central banks' CBDC projects continue to rise

Number of instances



Update 13 January 2023.

Source: R Auer, G Cornelli and J Frost (2020): "Rise of the central bank digital currencies: drivers, approaches and technologies", *BIS Working Papers*, no 880, August.

- Introduction of US digital dollar CBDC could significantly affect Financial Services and Payments industries
- As a digital payments leader, Visa must integrate services and infrastructure with CBDC for fast, secure interoperability
- Visa must stay ahead in Digital Payments by conducting risk analysis, collaborating with financial institutions, technology partners, and CBDCs worldwide for CBDC-compatible solutions
- Visa must continuously navigate evolving regulatory landscape to remain a pioneer in global digital payments



# CBDC Stakeholders and Cutting-Edge Pilot Projects by Visa

## Primary CBDC Stakeholders

- Central Banks
- Regulators
- Financial Institutions
- Technology Providers
- Consumers
- Businesses
- Payment Processors
- Settlement Banks

## Visa's Cutting-Edge Pilot Projects

- 1. CBDC Payments Module**
  - Streamlining CBDC management for Central Banks and Financial Institutions
  - Integrating with existing payment networks
- 2. UPC Hub**
  - Trusted "universal adapter" for client's blockchain networks
  - Facilitating seamless value exchange across different currencies
- 3. Secure OPS Protocol**
  - Enabling digital payments in CBDC without internet connectivity
  - Ensuring sender and receiver privacy even when temporarily offline



## Cross-Border Payments: An Integral CBDC Use Case

### Visa's Current Initiatives and Recommended Scaling Strategies

#### Visa's UPC Hub: Trusted "universal adapter" among blockchain networks

- Facilitates seamless value exchange across different currencies

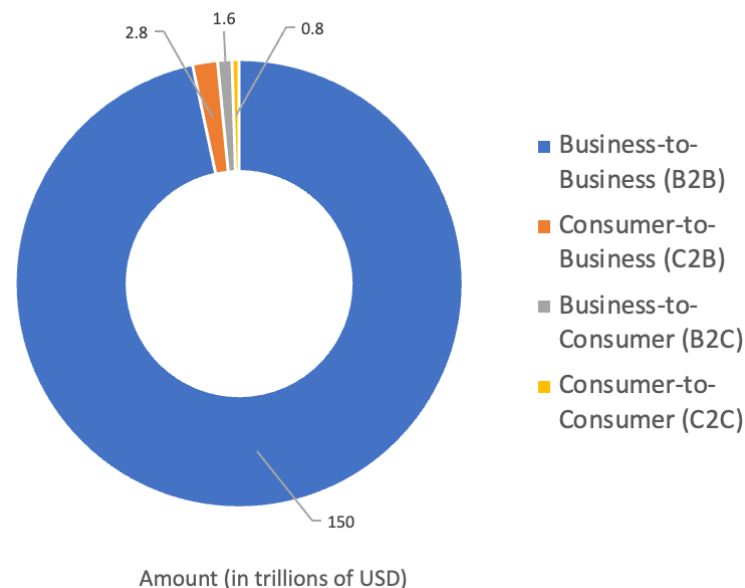
#### Enhancing CBDC Cross-Border Payments:

- Fundamental decisions on cross-jurisdictional connections are crucial
- No "one size fits all" model for CBDC interoperability (BIS, IMF, World Bank report)

#### Scalability Planning for UPC Hub:

- Adapting to different CBDC designs of central banks
- Supporting diverse cross-border arrangements with primary focus on B2B, followed by C2B, B2C, C2C (*Refer the donut chart on this slide*)

### 2022 Global Cross-Border Payment Breakdown



Source: Ernst & Young



## Scaling CBDC Real-Time Settlement: Key Strategies for Visa

- Real-time payments are essential due to their immediate and secure nature, financial inclusivity, and driven by increasing global adoption (*Refer data in the figure*)

### Recommendations for Visa

- Explore *Distributed Ledger Technology* to interlink RTGS systems with asset ledgers
- Harness technology advancements for real-time settlement efficiency
- Collaborate on experiments with industry and regulators
- Develop standardized protocols for cross-network settlement
- Design the system to be inclusive and accessible to diverse participants



### Regional Real-Time Payments Volume Projection, 2027

Region	2027		CAGR (2022-2027)
	Real-Time Payments Volume (millions)	Real-Time Payments Share of Electronic Payments Total (%)	
APAC	327.8	12%	14.1%
Latin America	119.5	56%	29.3%
Europe	34.2	13%	21%
North America	13.0	5%	27.3%
MEASA	249.8	79.3%	21.2%

Source: Aggregated data from Prime-Time for RealTime, ACI Worldwide



## Leveraging Visa's Value-Added Services for CBDC Adoption

- In the midst of FinTech disruptions, a whole new subsection of digital players has emerged: PayTechs
- PayTechs' relentless disruption means that only banks and payment service providers that offer "**value beyond payments**" can compete

The share of PayTech is valued at over

**\$2.17tn**

and continues to increase rapidly.

*Source: CB Insights and EY analysis*

### Utilizing Visa's Expertise in Value-Added Services in CBDC ecosystem

- Leverage **long-proven solutions** in Visa's value-added user-centric services
- Offer **fraud-risk management, transaction controls, data protection, and dispute resolutions**
- Improve **end user confidence and trust in CBDC** adoption by providing a user-friendly and inclusive CBDC environment
- Attract more end users to adopt CBDC with value-added services by **facilitating greater API functionality in the CBDC ecosystem**





# Advancing CBDC Transactions with Visa's Offline Payment Solutions

Parameters	Online payments	Offline payments
Network connection	Required	Not required
Transaction processing time	High	Low
Transaction value limits	High	Low
Risk to participants	Low	High
Acceptance	Widely accepted	Closed loop/limited acceptance

## Visa's Offline Payment Innovations

### Current:

- Visa's Secure Offline Payment System (OPS) Protocol utilizes **secure hardware** in mobile devices with strong user authentication like biometrics

### Future Recommendations:

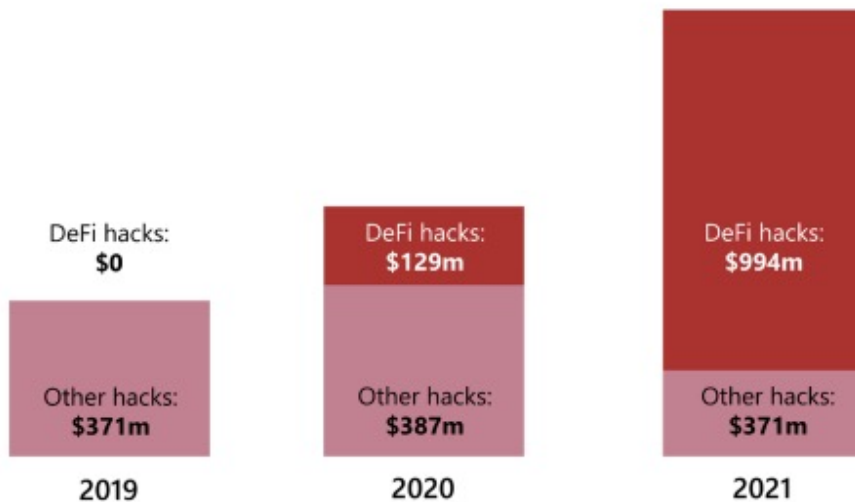
- Value Added Services that **extends payment limits and controls** to the Offline Payment System enhances security
- Real-Time Payment Notifications via alternative channels like texts **ensures visibility and transparency** even during offline situations

Source: PwC analysis



## Cybersecurity Readiness for CBDC Implementation

### Exponential increase of money stolen from De-Fi related hacks



This trend has continued with more than \$2.8 billion in cryptocurrency assets stolen in 2022

Source: Cyphertrace Cryptocurrency Intelligence

### Preparing for Cybersecurity Risks in CBDC Adoption

- There are unique risks posed by new technologies like DLT and smart contracts
- Visa requires advanced Threat Modeling utilizing new tactics like Consensus Logic Exploitation and Fund Exfiltration, as laid out by BIS Research & Publications, to model potential attacks in CBDC ecosystem



## SWOT Analysis of Visa in CBDC Landscape

### Strengths

- Global reach with established cross-border infrastructure
- Strong brand recognition worldwide
- Excellent security track record
- Operational resilience

### Opportunities

- Meet increased demand for cyber attack security and offer CBDC digital wallets.
- Seamless interoperability between Cross-border CBDCs and existing infrastructure, with value-added services like rewards, fraud prevention, transaction controls, and customer support.
- Offer analytics services to understand customer CBDC usage and explore advanced features such as programmability, smart contracts, and real-time settlement

### Weaknesses/Challenges

- Downward pressure on fees due to the low cost of CBDC transactions
- Adoption to new CBDC regulations around the world
- Infrastructure upgrade

### Threats/Risks

- Regulations reducing demand for current services
- Disintermediation in certain transaction types and clearing/settlement
- Financial crimes and potential competition from financial institutions and technology providers offering CBDC-related services directly to end-users.



## Embracing the Future: Visa's CBDC Action Plan

### 1. Leveraging Current Strengths:

- Global reach, brand recognition, security track record, and operational resilience to drive CBDC success

### 2. Addressing Major Challenges:

- Tackling fee pressure, regulatory adaptation, and infrastructure upgrades head-on for seamless CBDC integration

### 3. Mitigating Regulatory Risks:

- Collaborating with Federal Reserve on pilot projects for cross-border interoperability

### 4. Seizing Opportunities for Growth:

- Capitalizing on cybersecurity solutions, CBDC digital wallets, and value-added services

### 5. Enhancing Payment Experiences:

- Exploring CBDC analytics, programmability, smart contracts, and real-time settlement features

### 6. Innovating for Customer Loyalty:

- Creating a cohesive and user-friendly ecosystem to maintain market position and brand loyalty