

# CRYPTOCURRENCIES & CBDCs

Gary Munro | December 2021 | Multos Consortium Member Meeting

# Agenda

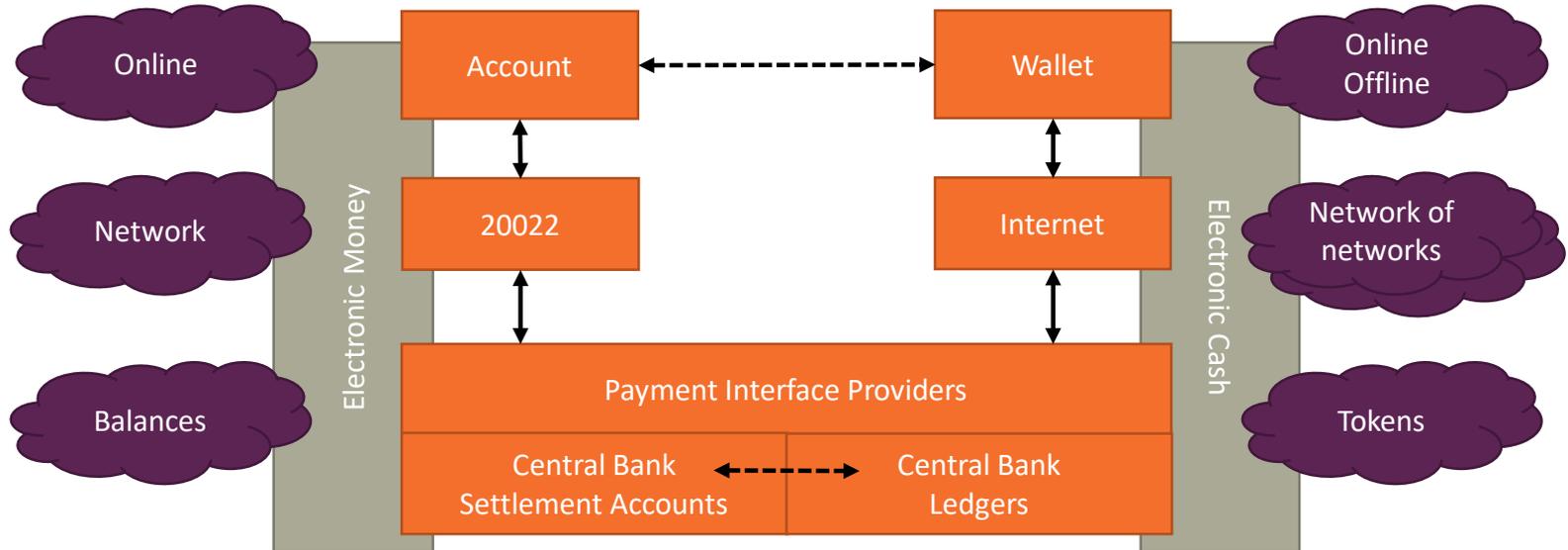
- What are CBDCs?
- Some background
- Use cases
- How to implement
- Implications

# What are CBDCs

# Terminology: Electronic Money and Electronic Cash

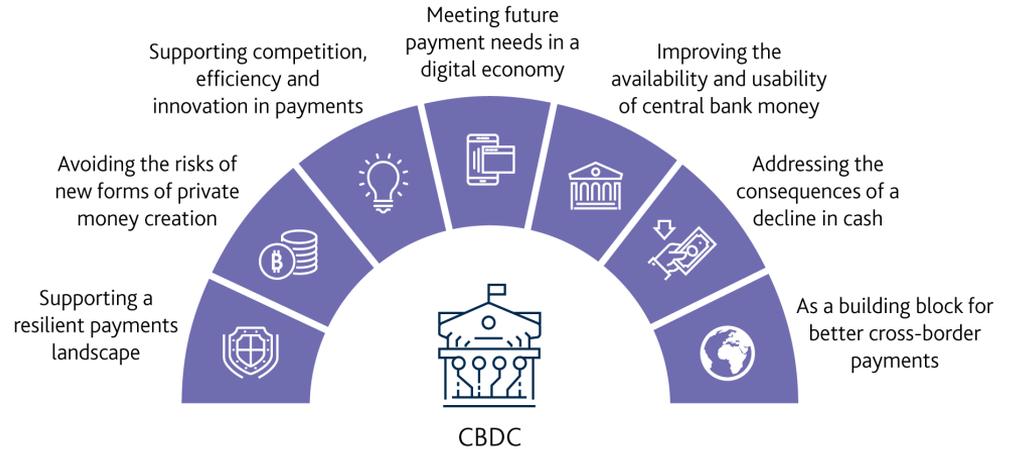
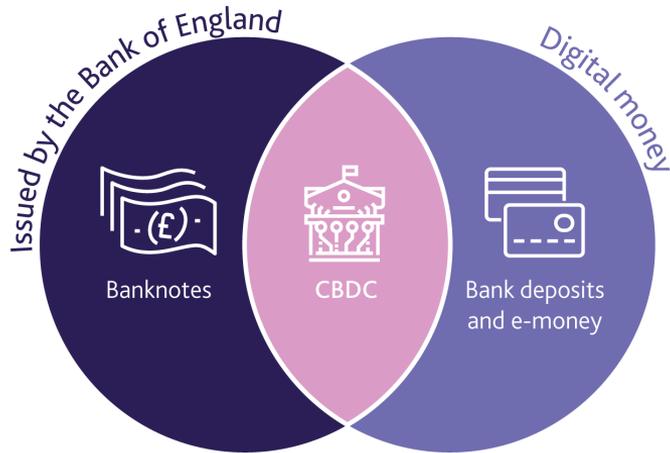
Electronic Money forms the basis of our traditional banking. Money resides in accounts and moves between accounts in a series of well understood transactions.

Electronic Cash resides in Wallets or "Pockets", it can be exchanged / used in the same way as traditional cash. Transactions can take place offline or online as needed.



# What is a CBDC?

A **Central Bank Digital Currency (CBDC)** is the digital form of a country's fiat currency that is also a claim on the central bank. Instead of printing money, the central bank issues electronic coins or account backed by the full faith and credit of the government.



# Some background

# Central Banks



Mark Carney, former governor of the Bank of England, gave a speech at Jackson Hole, Wyoming, in 2019 in which he said that a form of global digital currency could be “the answer to the destabilising dominance of the US dollar in today’s global monetary system”.

US dollar’s global electronic hegemony “made sense after World War II, when the U.S. accounted for 28% of global exports. Now, the figure is just 8.8%, according to the IMF. Yet the dollar still dominates international trade” (WSJ).

# Public and Private

In his speech Mr. Carney went on to talk about the idea of “Synthetic Hegemonic Currency” (SHC). This is form of Artificial Currency Unit (ACU) that has a long heritage.

There are, broadly speaking, two kinds of ACUs:

- those created by official institutions primarily for official international transactions and
- those introduced at the initiative of private companies for commercial transactions

Mark Carney and others are looking at the former, Mark Zuckerberg and others are looking at the latter!

- A global ACU...
- ...that is a synthetic currency...
- ...with a 100% reserve in fiat currencies...
- ...and used to settle internationally...
- ...could be become...
- Synthetic Hegemonic Currency (SHC)

# Public and Private

Who might plausibly issue digital cash?	Why would they issue?
Central Bank <i>Risk free under political control</i>	Fiat Money <i>Not including inflation in the definition of risk</i>
Commercial Bank <i>Credit money created by loans under political control</i>	Bank Money <i>What we have now. Money created by banks under central bank supervision.</i>
Company <i>Futures under commercial regulation</i>	Private Money <i>Currency to be redeemed against future products or services</i>
Cryptography <i>There is no issuer and no regulation of issue</i>	Rewards from Mining <i>Difficult to say, there may be political, personal, emotional reasons</i>
Community <i>Mutual credit money under decentralized political control and commercial regulation</i>	Local Money <i>"Local" means something different in the virtual and mundane cases</i>

*Before Babylon, Beyond Bitcoin by David G W Birch*

# Use Cases

# Use of CBDCs

There are many Central Banks considering the role of CBDCs in their financial systems. The German Bank model with 3 distinct sectors and use cases for CBDCs is particularly interesting.

## Wholesale CBDC

Issued by the central bank to be used for the capital markets and interbank transfers.

The central bank experts are calling for this special form of the digital euro partly because, by adopting this approach, the ECB would be able to include further digitalization of central bank accounts in its project.

The ultimate aim is to achieve improvements which can benefit consumers, enterprises and also the banking sector.

## Retail CBDC

Issued by the central bank is to be used by private individuals in the euro area in the same way as cash for everyday payments, e.g. to retailers or government agencies.

It should be possible to use the digital euro like cash, anonymously and offline.

For this purpose, credit institutions will provide consumers in Europe with "CBDC wallets", i.e. electronic wallets.

## Machine CBDC

"Tokenized commercial bank money" made available by commercial and savings banks.

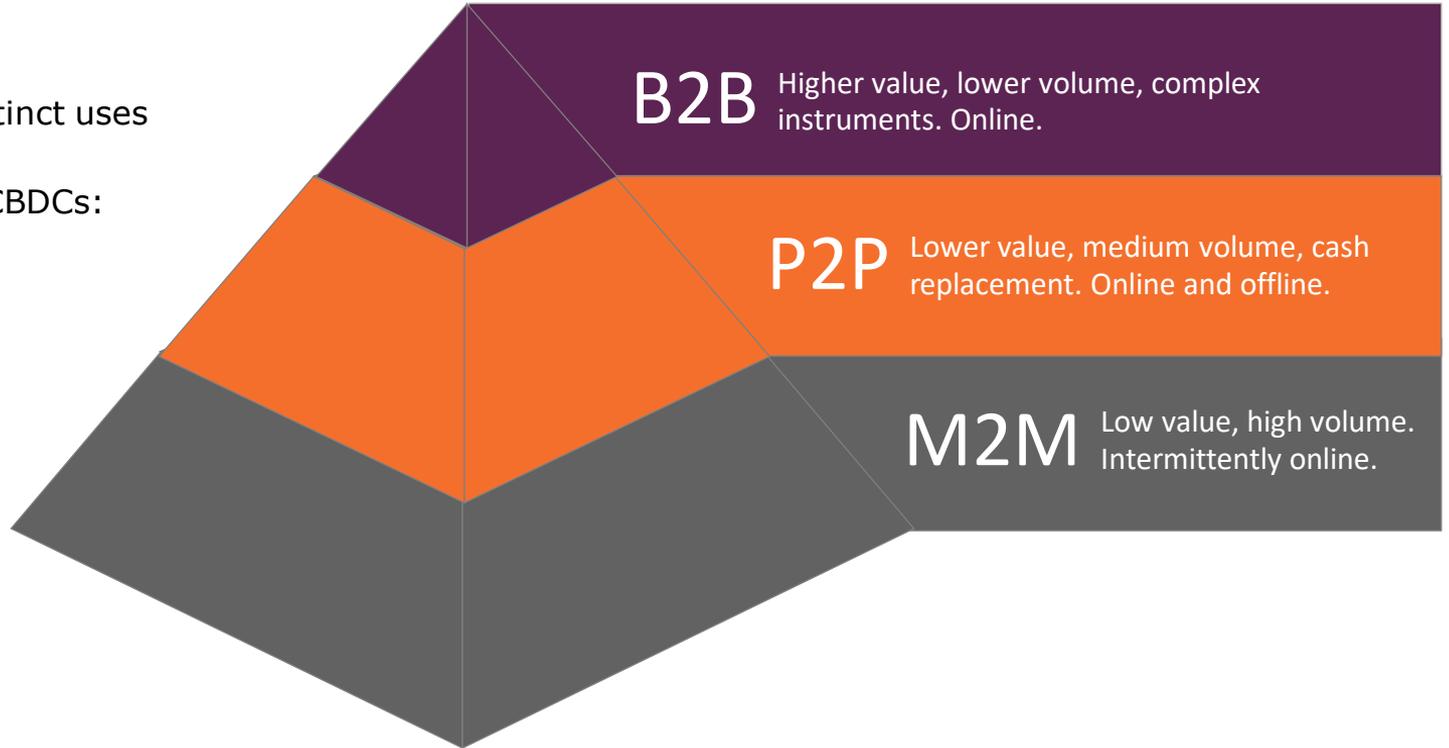
This is to complement the two forms of digital central bank money, in particular to meet corporate demand arising from Industry 4.0 and the Internet of Things.

It could facilitate transactions based on "smart" – i.e. automated – contracts and thus increase process efficiency.

# Use of CBDCs

This model sees 3 distinct uses  
(and potentially  
implementations) of CBDCs:

- Commercial
- Retail
- Industrial



# Implementation

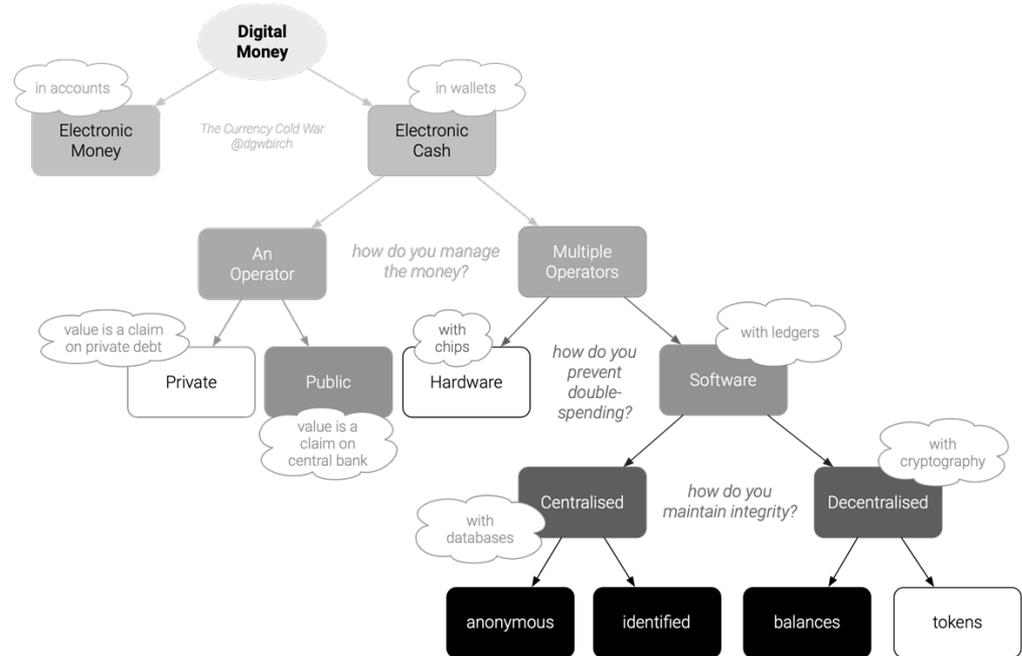
# Implementing Electronic Cash

The implementation of Electronic Cash will depend on a number of factors relating to how the Electronic Cash is constructed, issued and used. A clear understanding of the goals of digital cash is needed to ensure the right solution is arrived at.

If we look from an implementation point of view, we can see how different solutions are arrived at.

Here we consider:

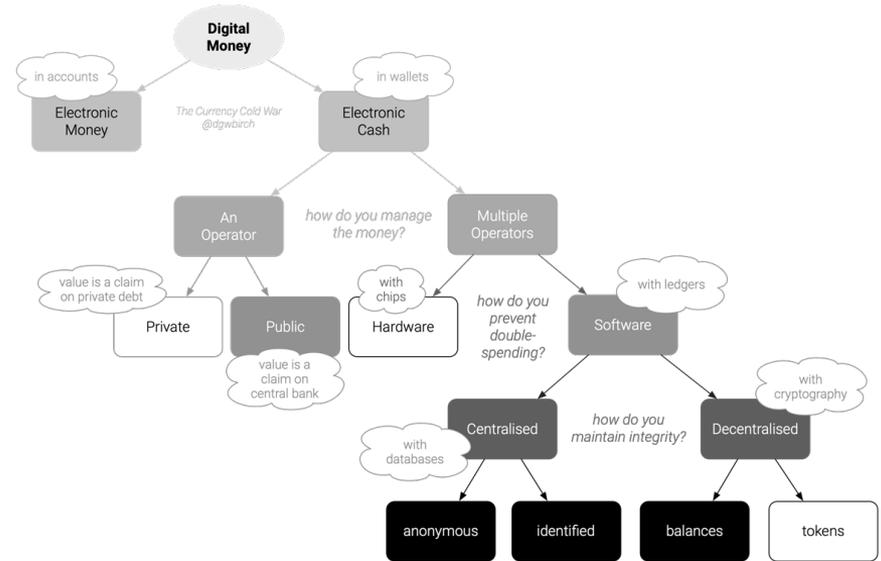
- Is there a Single or Multiple operator?
- How do you prevent double spending?
- How do you maintain integrity?



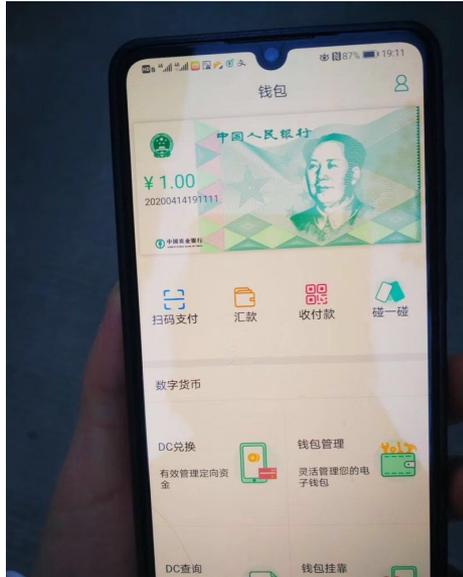
# Online or Offline Use?

The ability to transact Offline or not is a fundamental design consideration, with implications across the supporting ecosystem.

	Wholly Online	Partial Offline
Pros	<ul style="list-style-type: none"> <li>• Larger range of implementation options</li> <li>• Less impact on machines design</li> </ul>	<ul style="list-style-type: none"> <li>• Resilient by design</li> <li>• No need for ubiquitous comms</li> <li>• Matches digital Yuan; Euro; Pound thinking in this space.</li> <li>• Hardware backed security</li> </ul>
Cons	<ul style="list-style-type: none"> <li>• Requires extremely resilient highly available system, 5 nines or better</li> <li>• Requires ubiquitous comms services</li> </ul>	<ul style="list-style-type: none"> <li>• Has implications on design of machines / minimum standards</li> </ul>

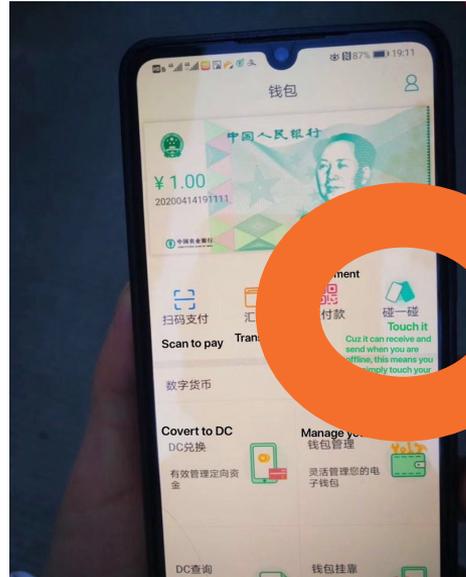


# People's Bank of China



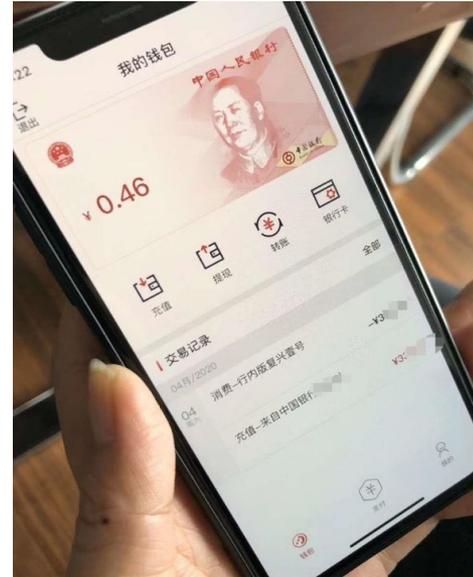
## Bank wallet

Can withdraw and deposit digital Yuan from / to account



## Offline device-to-device

As the PBOC say, "even Libra cannot do this" and they are correct. How could a blockchain do this?



## Live

No blockchain. This is not a "cryptocurrency" nor is it based on one.

# People's Bank of China

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DC/EP will be available through banks but also in Alipay and Tencent wallets.

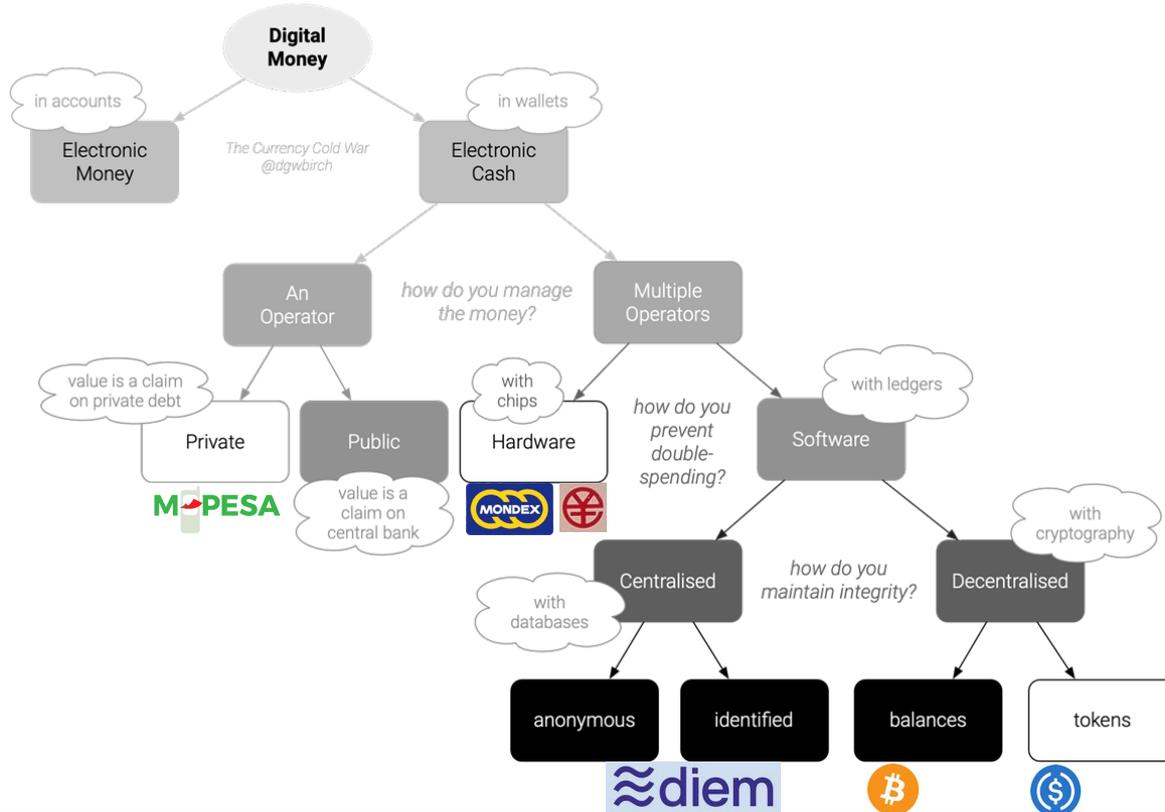
Distribution through China and along the belt-and-road!

Including wearables and powered cards.



# Implications

# Implementing Electronic Cash



# Questions?



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