

# BC3402

## Tutorial 6

### Qns 1

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#### i) Describe in detail the micro-payment network CEPAS

##### Introduction to CEPAS

Specification for Contactless e-Purse Application (CEPAS) is Singapore's specification for an **electronic money smart card** that replaces the EZ-Link card

##### Mechanism

Provides command sets and data bytes that can be used for contactless e-purse smart cards in Singapore, in debit and credit areas.

Therefore, CEPAS can be used by card issuers to allow interoperability of **multi-purpose stored value (MPSV)**



##### Purpose of CEPAS

- NETS dominates the retail and motor sectors (ERP, parking)
- EZ-Link dominates the transit sector (buses and trains)
- CEPAS aims to open up the micro-payments landscape with a single standard for **interoperable use**

#### ii) Do you think CEPAS can be classified as a form of "electronic money"?

Yes, CEPAS is electronic money

##### Multipurpose

CEPAS-compliant NETS and NETS Flashpay can now be used in transit sectors. CEPAS-compliant EZ-Link can now be used in retail and motor sectors.

Therefore, CEPAS is a **software** for card-based products to have multipurpose stored value.

##### Ownership of token and money

CEPAS mainly follows ISO 7816-4 that specifies

- Access methods to **data elements in the card**
- Contents of command-response pairs **exchanged at interface**

CEPAS commands "**Read Purse**", "**Debit Purse**", "**Credit Purse**" attributes to the idea of **token ownership**.

Since money from debit and credit cards are deposited into the e-purse, and can also be used for payments, **ownership of token is equivalent to ownership of money**

## a) What is CEPAS? Is CEPAS E-money?

## (bi) What are some of the proposed benefits of CEPAS?

### bi) What are some of the proposed benefits of CEPAS?

**01)**  
Ease and convenience of using one card to make seamless electronic payments

- **Consumers:** Allows any smart card that complies with the standard to be used with the system in a wide variety of payment applications (Transit and Non-Transit)
- **Merchants:** Reduced cost of payment infrastructure implementation as merchants will be able to deploy a single reader for their transaction processings as compared to having multiple readers.

**03)**  
Full access of the card's stored value for non-transit and transit payments

- Remove the need for travel deposits and helps reflect the full value of the card for transit and non-transit purposes

**02)**  
Helps open and level the micro-payment playing field for Card Issuers

- This form of standardization can help lower the reader and card cost in the longer term due to multi-vendor support and extend market share
- Allows more card issuers such as banks and financial institutions and even smaller players to participate in the micropayment space

**04)**  
Reduce the number of paper transactions

- Meets IDA and payment industry goals of reducing paper transactions and doubling the annual value of card based payments

## (bii) Why do you think there is a need to propose this new payment system given the wide range of options currently available?

### Centralization enable greater synergy between applications and minimize resource duplication

#### Card issuer

Lower cost of infrastructure  
E.g. LTA can leverage on NETS card top-up infrastructure

#### Consumers

Access to wider range of top-up infrastructure islandwide

#### Merchant

Deploy single reader for their transaction processing

## Nation's move towards cashless society

Foster greater cooperation among various payment platforms to open more solutions that can be used on a wider national scale.

CEPAS terminals are already able to accept payment via NFC.

Contactless smart cards payment transactions were found to be 63% faster than cash and 53% faster than swiping conventional credit cards. This could reduce queueing time and potentially result in higher sales and transaction volumes.

CEPAS abide to international standards. Smart cards issued in Singapore could be used in countries that adhered to ISO standards, possibly leading to exporting technology overseas.

(c) The successful deployment and adoption of micro-payment networks and especially electronic money within a nation or society is never an easy task. What are some of the factors that will determine the success of CEPAS?

## 4 Broad Success Factors

### Security

Confidence and Trust in using network



### Compatibility

Backward compatible (e.g. credit cards chips)

### Seigniorage

Who lends? Receives?  
Who bears the risk?  
Minimise costs as money travels

### 2-Sided Market Externality

How to make it win-win for parties in the network



## E-money vs E-Payments

### E-Money

- Chip based
- Mainly issued by banks
- Something you own

### E-Payments

- Server based
- More common to be private companies
- More similar to an application

In summary, if you physically own it, it's e-money. If its an application installed on your phone which relies on internet connection, it's e-payment

## Essential Factors for CEPAS

### Risk Management

- Prevent Double-entry bookkeeping
- Transaction traceability and monitoring

### Adaptability

- Easy to integrate with new technologies (e.g. Cryptocurrencies)
- Scalability - Large scale access to stores of value

## Latest Initiatives

2019

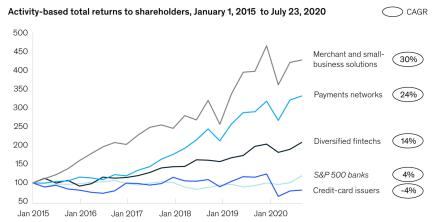


2021



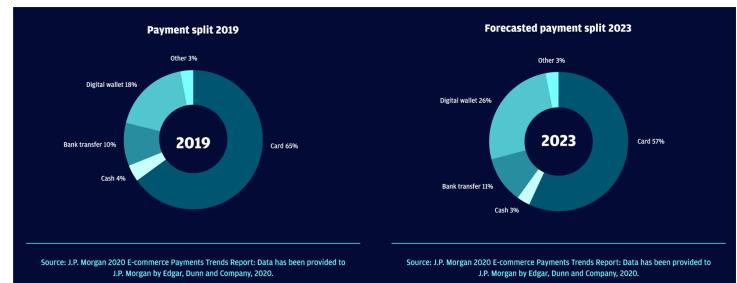
## E-payment Outperformance

Most payments providers, except for credit-card issuers, have outperformed the broader banking index since 2015.



McKinsey  
& Company

## Singapore 2020 Payment Market Share



### Global Concept



### Decentralisation (Food for Thought)



### Central Bank Digital Currency (CBDC)



TEMASEK  
Monetary Authority of Singapore

Source: <https://www.mas.gov.sg/publications/monographs-or-information-paper/2022/global-cbdc-challenge-2021>

Ultimately convenience is the main selling point for e-moneys like CEPAS. To continue to be successful, CEPAS must continue to be riskless and adaptable to new fintech innovations



**Thank  
You!**