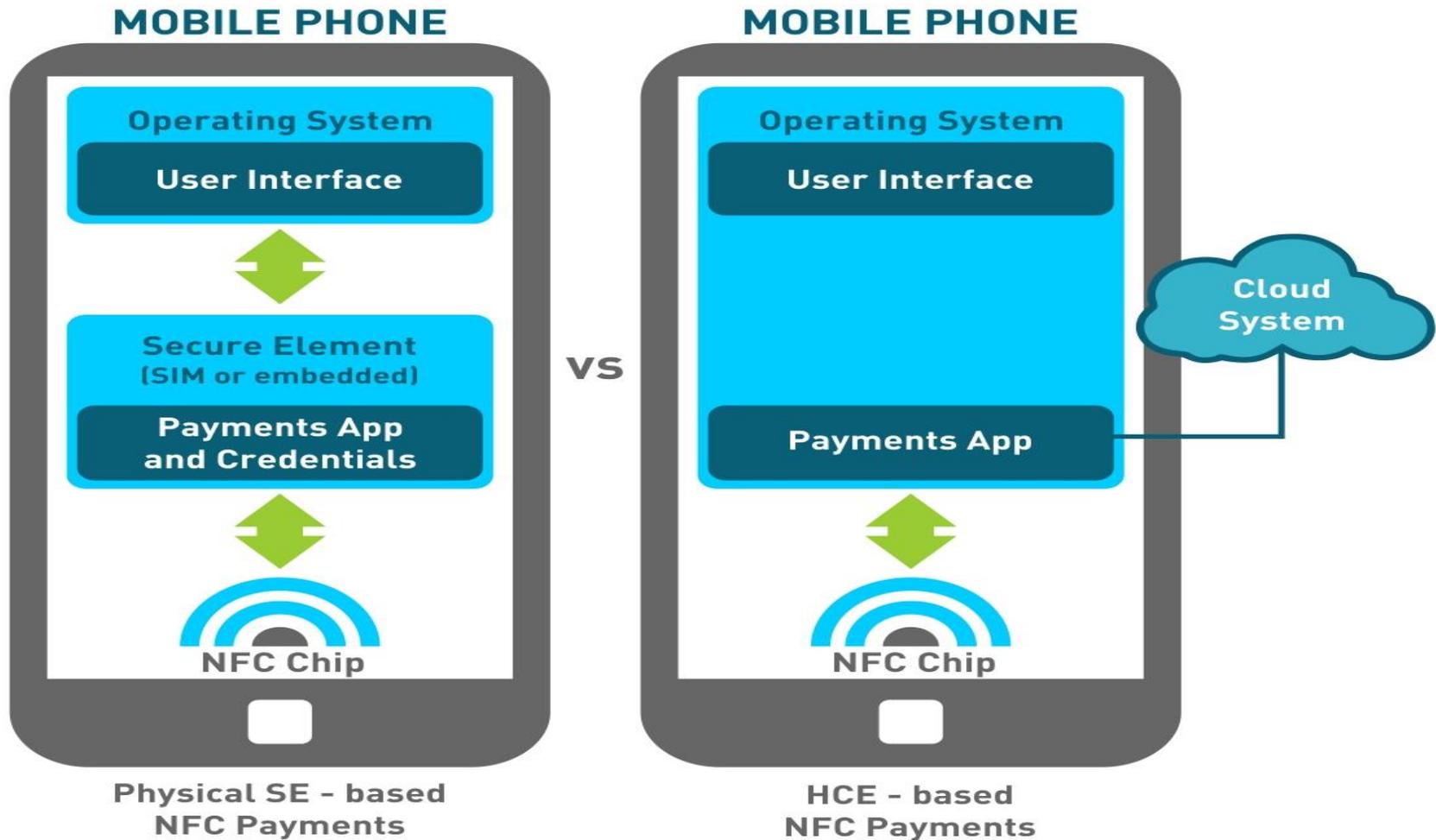# Mobey Forum's HCE workgroup:
HCE Options for Financial Institutions

Draft Paper in Member Review

Zaf Kazmi, CaixaBank

Kristian T. Sorensen, Nets

#MobeyDay

Comparison of HCE & Physical SE

MOBILE PHONE

Operating System
User Interface
Secure Element (SIM or embedded)
Payments App and Credentials
NFC Chip

Physical SE – based NFC Payments

VS

MOBILE PHONE

Operating System
User Interface
Payments App
Cloud System
NFC Chip
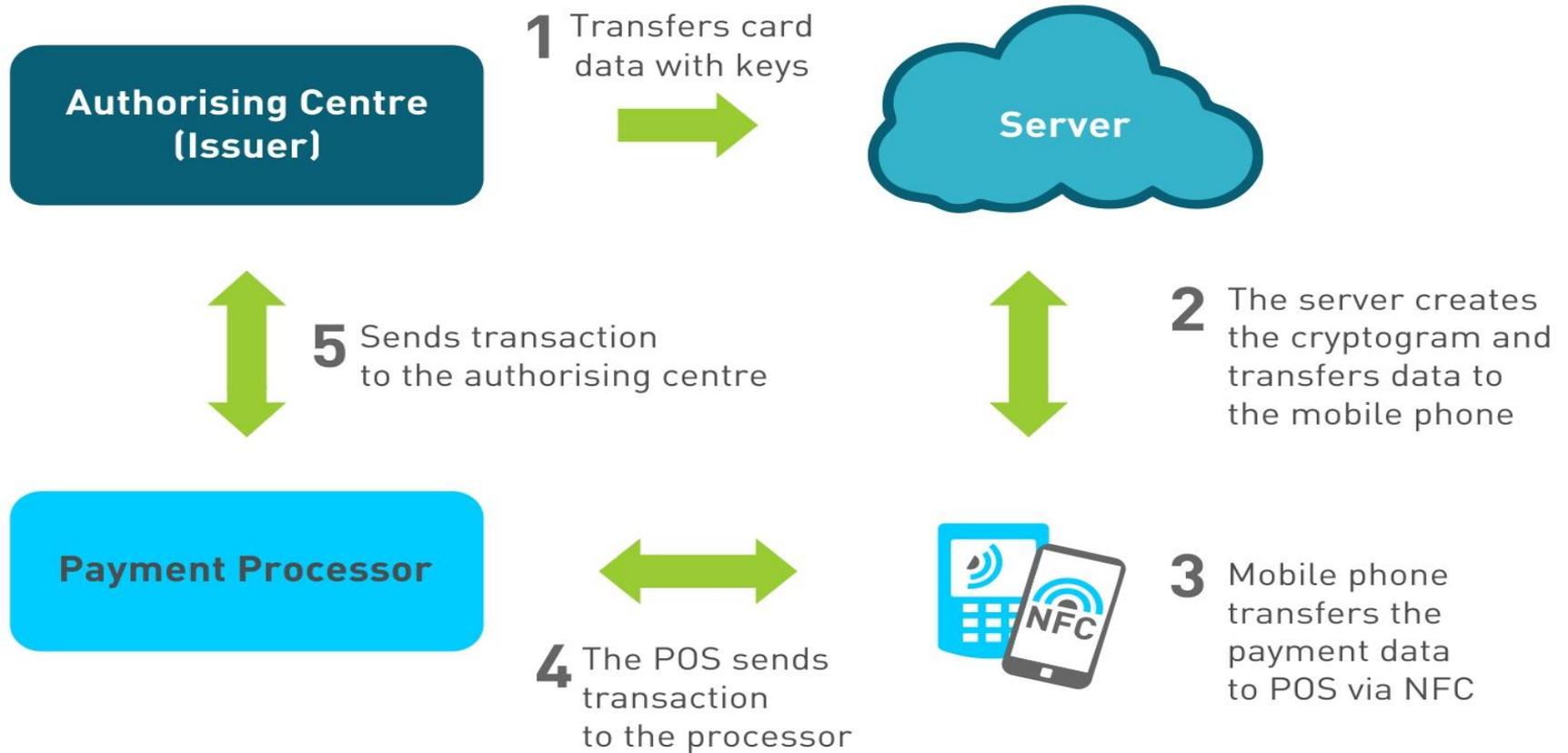
HCE – based NFC Payments

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The Roles

- Compared with physical SE-based NFC payments, an HCE-based business model is much more straightforward – in theory, the issuers can do it all themselves.

- Such a full in-house implementation might help avoid recurring fees; however, the issuers would have to invest upfront to develop a solution, and would likely engage specialist **HCE solution providers**. For token based HCE solutions, the issuers may also want to utilise a third party **Token Service Provider**, which would likely charge for its services.
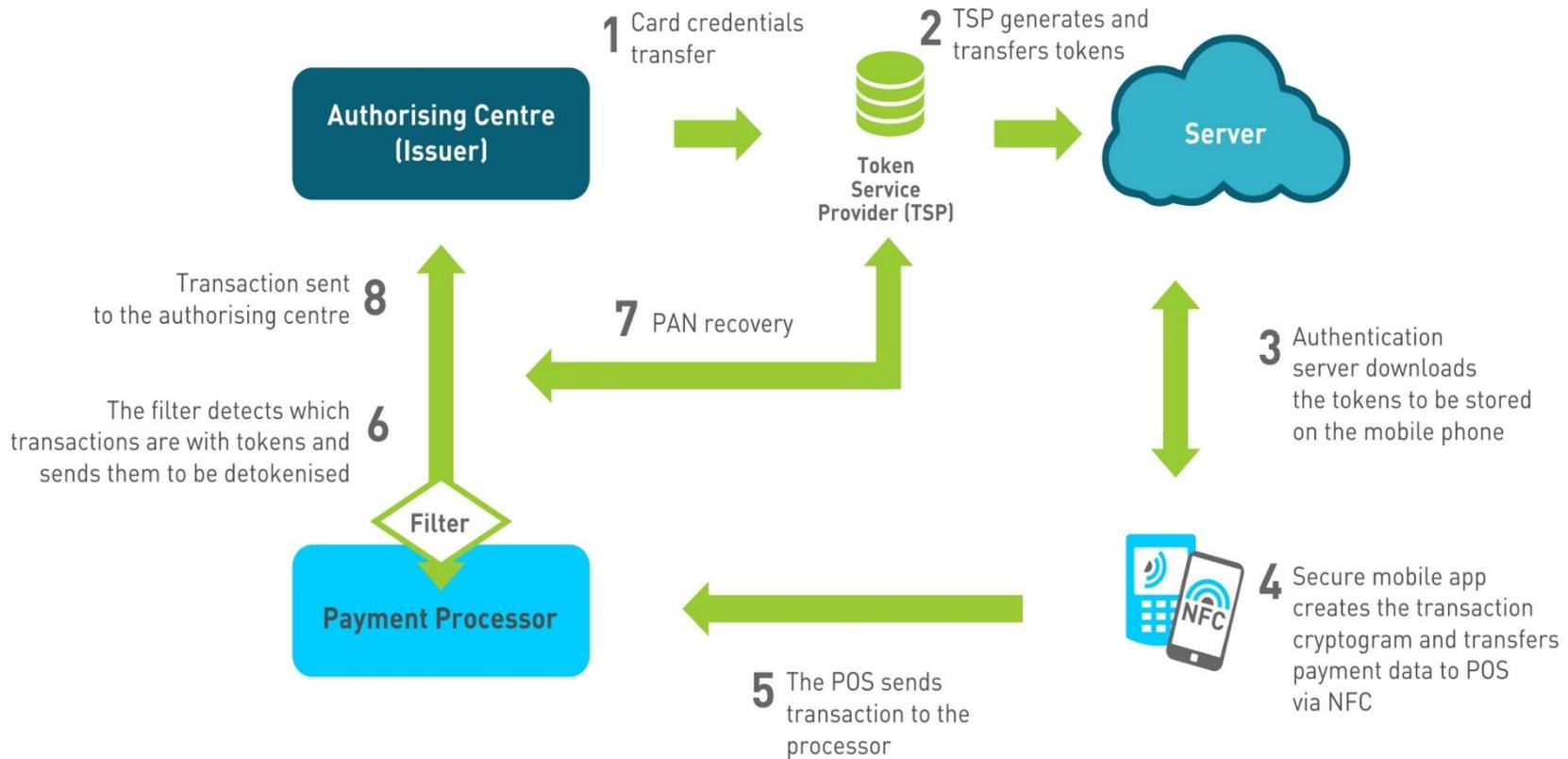
	Issuing/ Provisioning	Security	User experience	Business model
Physical SE	Requires provisioning of the payments app and credentials to a physical SE on the phone. A new SIM card will probably be needed.	Very secure, chip-based, tamper resistant environment	Seamless. Works without battery.	Complex ecosystem and business models: issuers need agreements with both SE owners and TSM providers.
HCE Solution	Payment app can be downloaded from the app store; payment credentials supplied as needed by the solution.	Risk-based authentication Utilising limited-use payment credentials (e.g. tokens) and other risk management techniques.	If slow network, users may experience slow transactions. Tokens have to be delivered to the phone ahead of the transaction Battery power may be required.	Fast time to market – However, issuers may want to partner with HCE solution providers or utilise third-party Token Service Providers.

Transaction Flow in a Full Cloud Based HCE Solution

Authorising Centre (Issuer)

1 Transfers card data with keys

Server

2 The server creates the cryptogram and transfers data to the mobile phone

5 Sends transaction to the authorising centre

Payment Processor

4 The POS sends transaction to the processor

3 Mobile phone transfers the payment data to POS via NFC

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Transaction Flow in the Card Emulation by Phone Application Solution

1 Card credentials transfer

2 TSP generates and transfers tokens

Authorising Centre (Issuer)

Token Service Provider (TSP)

Server

8 Transaction sent to the authorising centre

7 PAN recovery

3 Authentication server downloads the tokens to be stored on the mobile phone

6 The filter detects which transactions are with tokens and sends them to be detokenised

Filter

Payment Processor

4 Secure mobile app creates the transaction cryptogram and transfers payment data to POS via NFC

5 The POS sends transaction to the processor

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Security & HCE

- HCE represents a **fundamental security paradigm shift**. In the traditional physical SE-based NFC world, we need a physical space on device to secure our data. In HCE, the starting assumption is that the phone is NOT secure, and we use tokenization and other techniques to mitigate risk.

Survey made in September 2014

In September 2014, Mobey Forum surveyed over 100 banks and technology/service providers on their views on HCE.
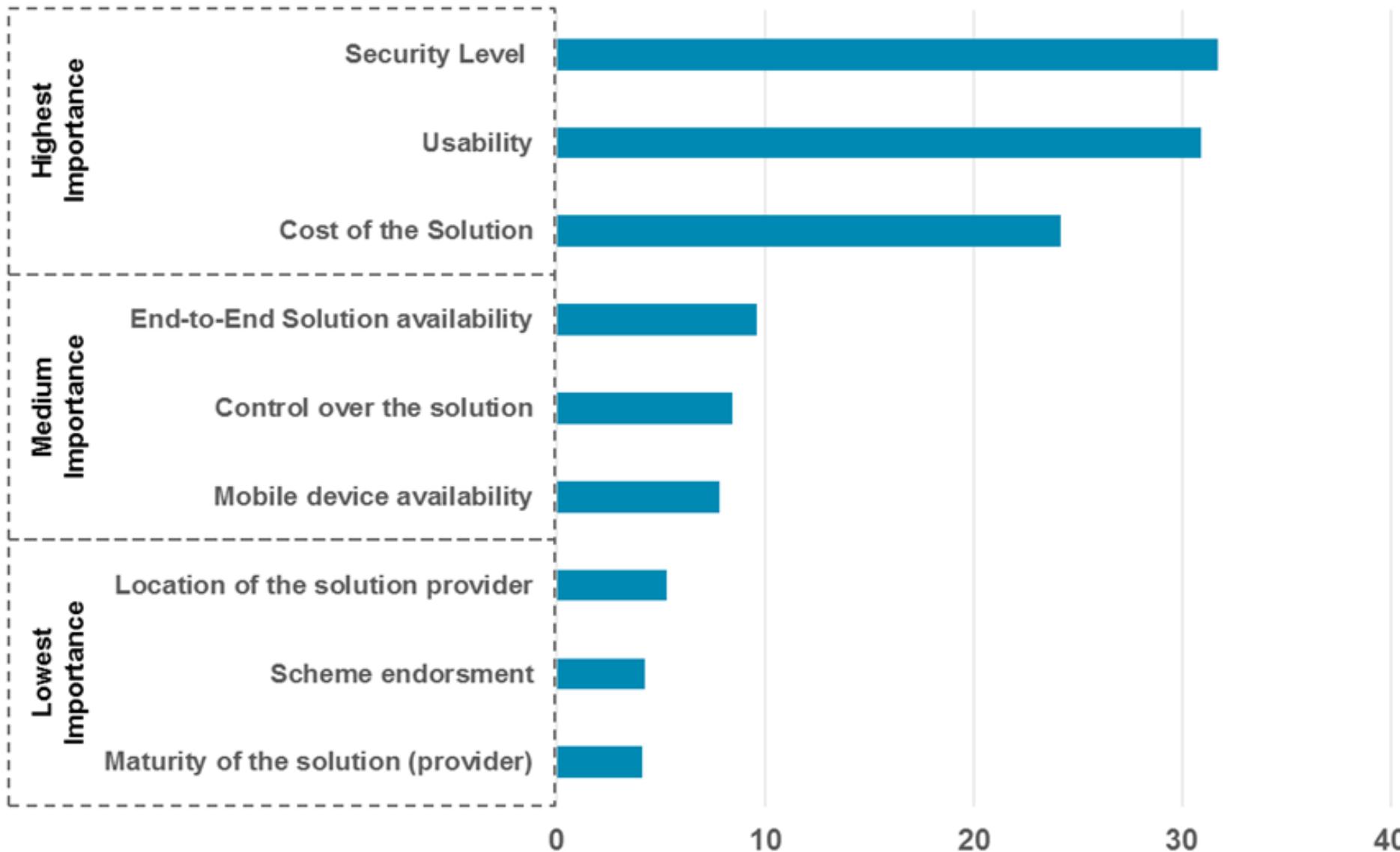

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Question for Banks: Which part of the HCE solution would you consider doing in-house?
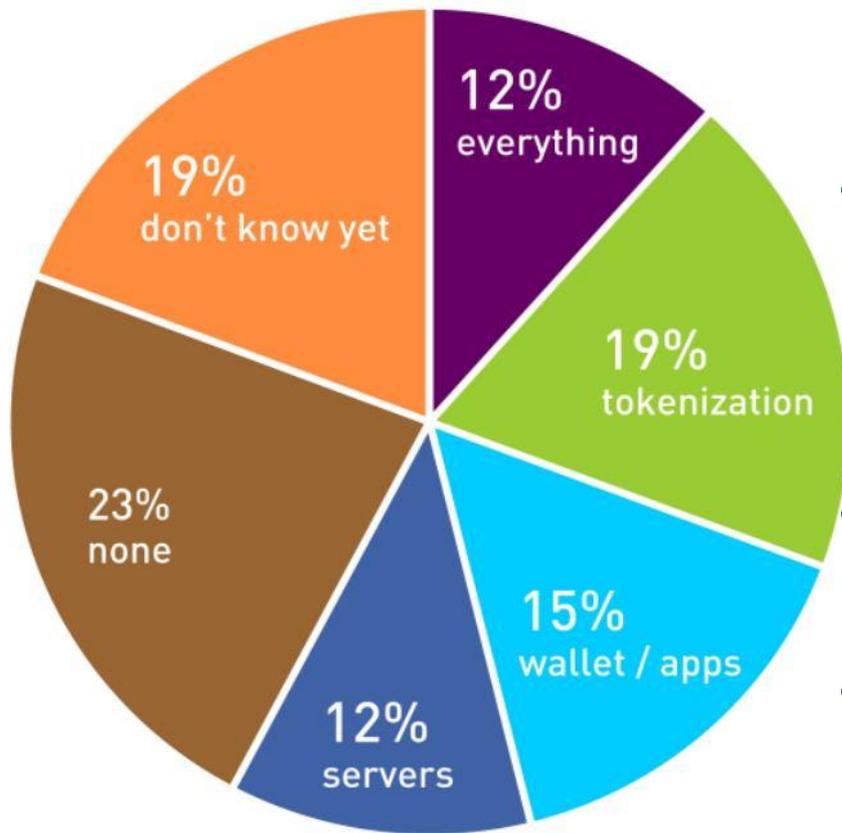
19% did not know what they might do. Example comments include:

- *"We are currently looking for solutions in the market. Depending on the outcome we could outsource everything or do some things in-house."*

- *"Still evaluating the best option for our organisation."*

- *"Challenging question, given that set-up (what is done in-house, what with partners) varies a bit from country-to-country. HCE could potentially even be good at unifying some of the current set-ups [across] countries."*

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Weighted Importance of Criteria to Select a Solution Provider

Highest Importance
- Security Level
- Usability
- Cost of the Solution

Medium Importance
- End-to-End Solution availability
- Control over the solution
- Mobile device availability

Lowest Importance
- Location of the solution provider
- Scheme endorsment
- Maturity of the solution (provider)

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What's Next?

- Mobey Forum's first HCE paper to be published towards the end of this month

- Potential future topics to include:
  - Usecases/end user prospectives
  - HCE vs Tokenization
  - Control Points
  - Security
  - Legislation & certification

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Special Thanks to

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European Payments Council:

Mobile Commerce Workgroup