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Digital euro pilot

Frontend implementation specifications

Data management



Disclaimer: This document is indicative and may be subject to modifications. The design, features, and scope of a digital euro may also differ if issued in the future.



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Introduction

Detailed implementation specifications for the different domains and interactions between actors as presented in the diagram below. This document is dedicated to data management and only focuses on online processes. **Offline scope is excluded.**

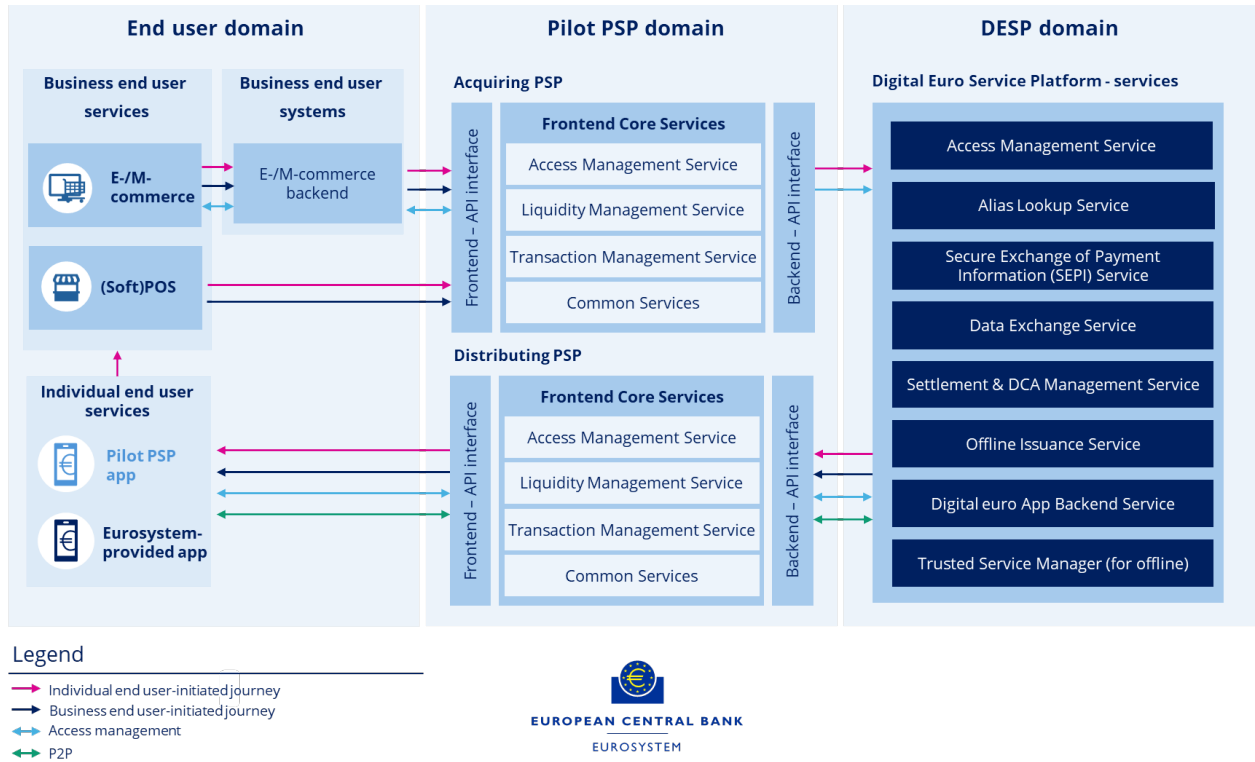


Figure 1 Digital euro pilot - functional architecture

Structure of the document

Data model

This chapter provides a simplified representation of the data. It describes the entities (the key objects in the domain, such as an end user, a transaction, or an account), their essential attributes, and the relationships that exist between them, without considering technical constraints or how the data will be stored.



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It is not intended to represent the entirety of an information system, nor to specify the information that may already be managed by existing systems. The objective is to set the context of beta digital euro within a system.

Data dictionary

This chapter describes the data supporting the different processes designed so far. Its purpose is to ensure a shared understanding and to guarantee the consistency, quality, and proper use of information.



2. Data Model

An illustrative description of the Data Model is proposed to provide an overview of the elements that will be needed to support the beta digital euro in an online mode. It complements the High-Level Functional Architecture view.

The data model presented in this chapter corresponds only to the front-end view. However, some entities belonging to DESP domain are reflected for a better understanding of the complete model.

2.1. Static data for individual end users

2.1.1. Model

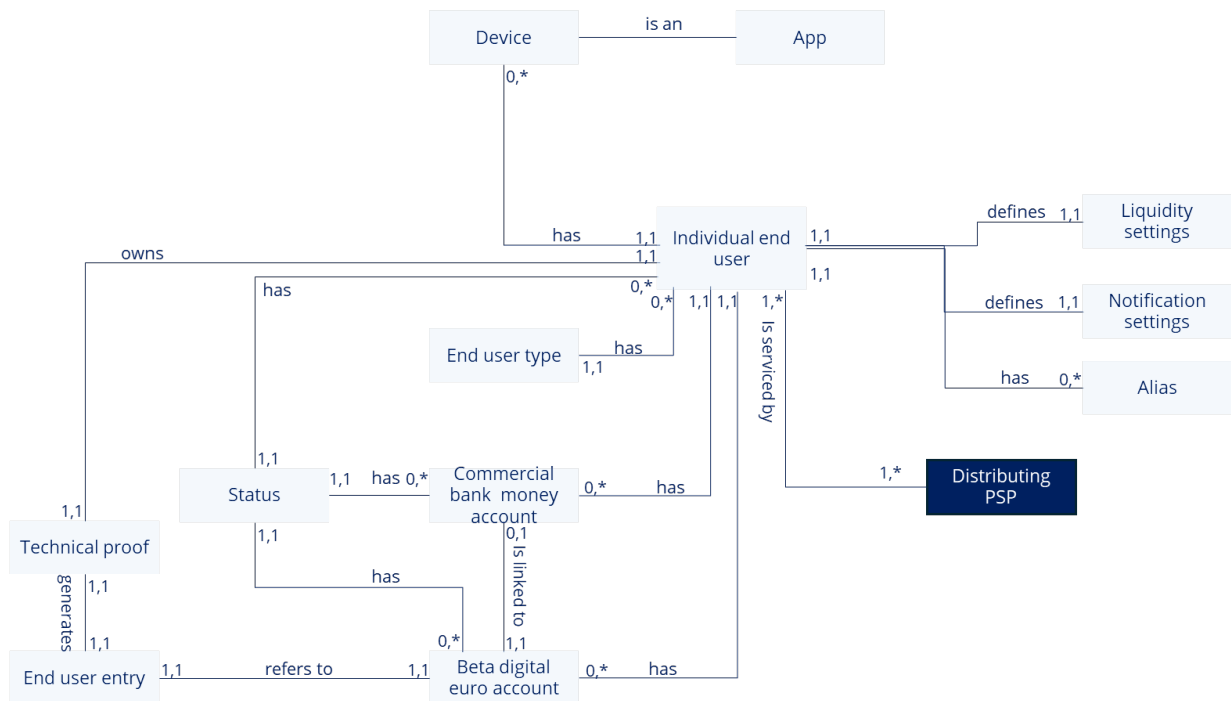


Figure 2 Static data model for individual end users

2.1.2. Relations between entities

Entities	Relation	Description	
End user type	Individual end user	Has	Defines the possible types of an individual end user An end user has only one end user type.
Mobile Device	Mobile app	Is a	Defines the possible types of a mobile device A mobile device is a mobile app.



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Entities		Relation	Description
Individual end user	Mobile device	Has	<p>Defines the links between the end user and mobile device</p> <ul style="list-style-type: none"> • An individual end user can have several mobile devices. • A mobile device belongs to only one individual end user.
Individual end user	Liquidity settings	Defines	<p>Defines the rules for liquidity setting.</p> <ul style="list-style-type: none"> • An individual end user can define only one set of liquidity settings. • A set of liquidity settings is defined by only one individual end user.
Individual end user	Notification settings	Defines	<p>Defines the rules for notification setting.</p> <ul style="list-style-type: none"> • An individual end user can define only one set of notification settings. • A set of notification settings is defined by only one end user.
Individual End user	Alias	Has	<p>Defines the rules allowing an individual end user to possess an alias</p> <ul style="list-style-type: none"> ▪ An individual end user can have 0 to 1 alias • An Alias belongs to only one individual end user
Individual end user	Commercial bank money account	Has	<p>Defines the rules allowing an individual end user to possess a commercial bank money account</p> <ul style="list-style-type: none"> • An end user can have 0 to several commercial bank money accounts • A Commercial bank money account belongs to only one end user
Individual end user	Beta digital euro account	Has	<p>Defines the rules allowing an end user to possess a beta digital euro account</p> <ul style="list-style-type: none"> • An end user can have 0 to 1 beta digital euro account • A beta digital euro account belongs to only one end user
Individual end user	Status	Has	<p>Defines the rules to provide a status</p> <ul style="list-style-type: none"> • An individual end user has only one status • A status can be assigned to many individual end users
Individual end user	Distributing PSP	Is Served	<p>Defines the links between a distributing PSP and an individual end user</p> <ul style="list-style-type: none"> • An end user can be serviced by one distributing PSP. • A distributing PSP is allowed to provide services to many end users
Individual end user	Technical proof	Owens	<p>Defines the links between an individual end user and a technical proof</p> <ul style="list-style-type: none"> • An individual end user owns only one technical proof • A technical proof is owned by one individual end user
Technical proof	End user entry	Generates	<p>Defines the links between a technical proof and an end user entry</p>



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Entities		Relation	Description
			<ul style="list-style-type: none">• A technical proof can generate only one end user entry• An end user entry is generated by only one technical proof
Beta digital euro account	Status	Has	Defines the links between a beta digital euro account and a status <ul style="list-style-type: none">• A beta digital euro account has only one status.• A status can be assigned to many beta digital euro accounts
Commercial bank money account	Status	Has	Defines the links between a commercial bank money account and a status <ul style="list-style-type: none">• A commercial bank money account has only one status.• A status can be assigned to many commercial bank money accounts
Beta digital euro account	Commercial bank money account	Is Linked To	Defines the links between both accounts. <ul style="list-style-type: none">• A beta digital euro account is linked to 0 to one commercial bank money account• A commercial bank money account can be linked to 0 or one beta digital euro account
Beta digital euro account	End user entry	Refers to	Defines the links between a beta digital euro account and an end user entry <ul style="list-style-type: none">• A beta digital euro account refers to only one end user entry<ul style="list-style-type: none">▪ An end user entry is linked to only one beta digital euro account
Beta digital euro account	Distributing PSP	Manages	Defines the links between a Distributing PSP and a beta digital euro account <ul style="list-style-type: none">• A beta digital euro account is managed by only one Distributing PSP.• A Distributing PSP manages many beta digital euro accounts



2.1.3. Entity description

2.1.3.1. Individual end user – pilot PSP space

2.1.3.1.1. Individual end user

An end user, defined as an individual end user in this chapter, represents a natural person who holds a beta digital euro account and benefit from pilot payment services.

Identifier and properties

Name	Description
End user identifier	Unique identifier of an end user.
Technical proof of end user's beta digital euro entries	Used to derive settlement ledger identifier(s) for the user's beta digital euro holdings. A hashed version is stored by the DESP to enable validation of emergency portability request
Creation date	Indicates when the end user is created – needed for life cycle traceability.
Amendment date	Indicates if modifications have been applied in the end user profile from the creation – needed for life cycle traceability.
Closing date	Indicates since when the end user is disabled – needed for life cycle traceability.

2.1.3.1.2. End user type

An end user type is assigned to an end user to determine if it is an individual end user or a business end user who performs transactions in beta digital euro.

Identifier and properties

Name	Description
End user type identifier	Unique identifier of a type of end user
End user type	Defines the type of end user (e.g. individual end user or business end user)

2.1.3.1.3. Mobile device

A mobile device is a component owned and used by the end user to benefit from pilot payment services. A mobile device can be used for online payments, offline payments, or both.

In the pilot context mobile device can be only be mobile app, which is a software application that allows end users to benefit from pilot payment services.

Identifier and properties

Name	Description
Device Identifier	Unique identifier of the mobile device
Device Type	Defines the type of mobile device (mobile app)



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Name	Description
Device IP address	Provides the IP address of the mobile device (if applicable)

2.1.3.1.4. Status

A status refers to an operational condition at a given time. It could refer to an end user or an account.

It categorises the end user according to their interaction with their pilot PSP under five possible states: is prospect, is active, is inactive, is suspended or is closed.

For a beta digital euro account, it indicates whether the account is active, inactive, blocked, closed, or subject to specific restrictions.

Identifier and properties

Name	Description
Status identifier	Unique identifier of a status
Status	Label of a status

2.1.3.1.5. Alias

An alias is a unique pseudonymous identifier used to protect the individual end user's identity when processing payment transactions that can only be attributable to an identifiable natural or legal person by the pilot PSP or by the individual end user.

An alias is expected to be the primary identifier shared in transactions with alias.

Identifier and properties

Name	Description
Alias type	Code type that is used to define a pseudonymous account identifier.
Alias value	Unique pseudonymous identifier of an account defined according to a type.

2.1.3.1.6. Commercial bank money account

A commercial bank money account is a payment account held in the name of one or more end users with a contractual relationship vis-à-vis a pilot PSP and that holds money that is not issued by a central bank (e.g. a current or a savings account).

Identifier and properties

Name	Description
Commercial bank money account number (IBAN)	Unambiguous identification of the commercial bank money account of the end user (payer or payee).



Name	Description
Opening date	Indicates when the commercial bank money account is opened - needed for life cycle traceability.
Closing date	Indicates when the commercial bank money account is closed - needed for life cycle traceability.
Commercial bank money account balance	Provides a numerical representation of commercial bank money account available holdings at a specific point in time.
Commercial bank money account balance date	Indicates the date of the commercial bank money account balance.

2.1.3.1.7. Beta digital euro account

A payment account held by an end user that is serviced by a pilot payment service provider (PSP) providing access to beta digital euro recorded in DESP, used to initiate or receive beta digital euro payment transactions, irrespective of technology and data structure.

Identifier and properties

Name	Description
Digital euro access number (DEAN)	Unambiguous identification of the beta digital euro account of the end user (payer or payee).
Opening date	Indicates when the beta digital euro account is opened - needed for life cycle traceability.
Closing date	Indicates when the beta digital euro account is closed - needed for life cycle traceability
Status	Indicates if the beta digital euro account is "Active" or not – needed for controlling the state of beta digital euro account.
Beta digital euro account balance	Provides a numerical representation of beta digital euro holdings at a specific point in time.
Beta digital euro account balance date	Indicates the date of the balance.

2.1.3.1.1. Technical proof

The technical proof is generated at end user onboarding to prove the ownership of the end end -user's holdings. It is not mandatory to distribute the technical proof to end users at this stage.

Identifier and properties

Name	Description
Technical proof identifier	Unambiguous identification of technical proof
Technical proof	Technical proof generated for the end user
Opening date	Indicates when the technical proof is created. Needed for life cycle traceability.



Provision date	Indicates when the technical proof is provided to the end user. Needed for life cycle traceability.
Closing date	Indicates the date from which the technical proof is no longer valid. Needed for life cycle traceability.

2.1.3.1.2. End user entry

An end user entry is used to identify the end user's holdings within the settlement ledger.

Identifier and properties

Name	Description
End user entry identifier	Unambiguous identification of an end user entry.
Opening date	Indicates when the end user entry is created - needed for life cycle traceability.
Closing date	Indicates when the end user entry is closed - needed for life cycle traceability.

2.1.3.1.3. Liquidity settings

Liquidity settings correspond to parameters used to automatically manage funding and defunding conditions, waterfall and reverse waterfall according to holding limits.

Identifier and properties

Name	Description
Liquidity settings identifier	Unique identifier of the set of parameters
Reverse waterfall indicator	Indicates if the end user has selected the reverse waterfall option or not
Waterfall indicator	Indicates if the end user has selected the waterfall option or not

2.1.3.1.4. Notification settings

Notification settings correspond to parameters used to define types of notifications and corresponding channel.

Identifier and properties

Name	Description
Notification settings identifier	Unique identifier of the set of parameters
Type of notification	Defines the list of possible notifications
Notification channel type	Defines the code type that is used to define the channel selected to receive notifications
Notification channel details	Corresponds to the detailed information of the channel according to its type
Notification trigger	Determines when a notification should be sent



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Content customisation	Defines which information should be included in the notification
Delivery and retry policy	Determines how notifications are delivered reliably
Priority and queuing	Manages the priority of notifications
Notification expiration	Defines the lifespan of a notification

2.1.3.2. Pilot PSP – DESP space

2.1.3.2.1. Distributing PSP

A distributing PSP is a pilot PSP offering to its individual end user pilot payment services.



2.2. Static data for business end users

2.2.1. Model

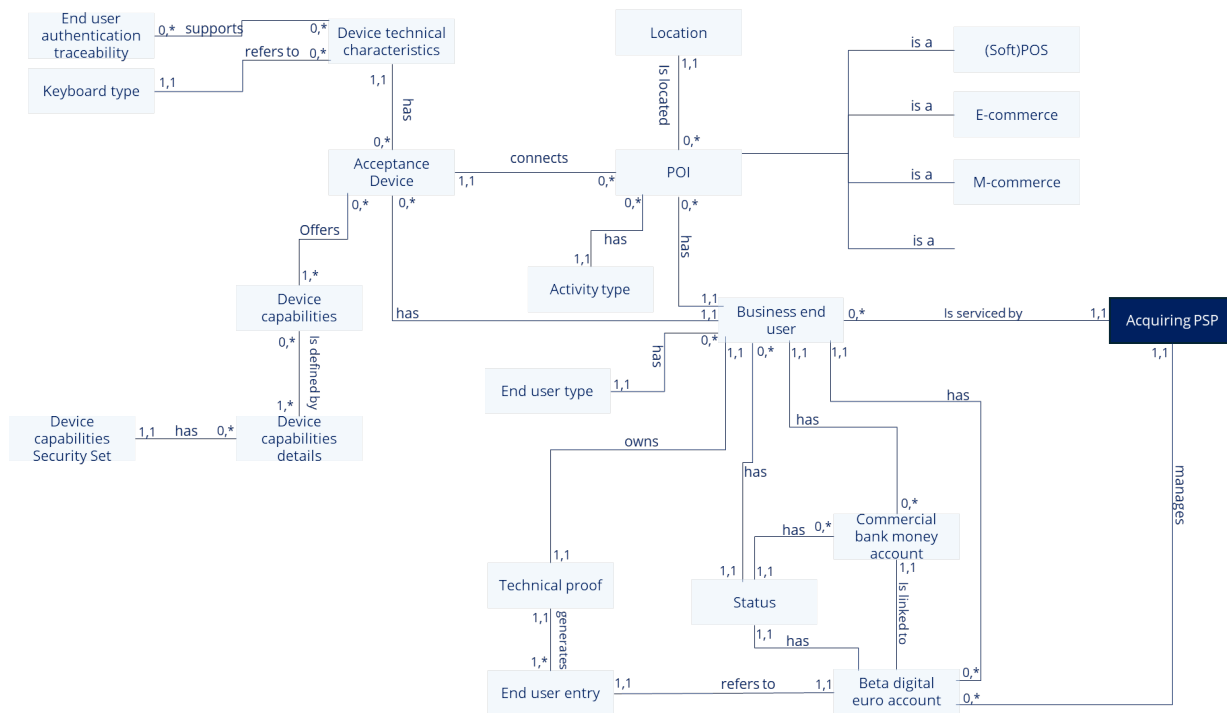


Figure 3 Static data model for business end users

2.2.2. Relations between entities

Entities	Relation	Description	
End user type	Business end user	Has	Defines the possible types of a business end user A business end user has only one end user type.
POI	POS (i.e. SoftPOS)	Is a	Defines the possible types of a Point of Interaction A POI could be a POS, an e-commerce or an m-commerce
	e-commerce	Is a	
	m-commerce	Is a	
POI	Location	Is located	Defines the possible locations of a POI. <ul style="list-style-type: none"> A POI is in only one location. A location can group several POI.
POI	Acceptance instrument	Connects	Defines the links between acceptance instrument and POI <ul style="list-style-type: none"> A POI can propose many acceptance instruments. An acceptance instrument is connected to only one POI
Acceptance instrument	Business end user	Has	Defines the links between a business end user and an acceptance instrument



Entities	Relation	Description
		<ul style="list-style-type: none"> • A business end user can have many acceptance instruments. • An acceptance instrument belongs to only one business end user
Acceptance instrument	Device capabilities	Offers Defines the links between acceptance instrument and device capabilities <ul style="list-style-type: none"> • An acceptance instrument can offer many capabilities ▪ A device capability can be offered by 0 to many acceptance instruments.
Acceptance instrument	Device technical characteristics	Has Defines the links between acceptance instrument and device technical characteristics <ul style="list-style-type: none"> • An acceptance instrument can have only 1 set of technical characteristics • A set of technical characteristics can be used by 0 to many acceptance instruments
Device technical characteristics	Keyboard type	Refers to Defines the links between device technical characteristics and keyboard type <ul style="list-style-type: none"> • Device technical characteristics can refer only to 1 keyboard type • A keyboard type can be used by 0 to many device's technical characteristics
Device technical characteristics	Customer authentication traceability	Supports Defines the links between device technical characteristics and customer authentication traceability <ul style="list-style-type: none"> • Device technical characteristics can support 0 to many customers authentication traceability • A customer authentication traceability can be supported by 0 to many device's technical characteristics
Device capabilities	Device capabilities details	Is defined by Defines the links between device capabilities and device capabilities details <ul style="list-style-type: none"> • Device capabilities can be defined by only 1 device capabilities details set • Device capabilities details can define 0 to many device capabilities
Device capabilities details	Device capabilities security set	Has Defines the links between device capabilities details and device capabilities security Set <ul style="list-style-type: none"> • Device capabilities details can have only 1 device capabilities security set • A device capabilities security set can be linked to 0 to many device capabilities details
Business end user	POI	Has Defines the links between a business end user and a POI <ul style="list-style-type: none"> • A business end user can have many POI • A POI belongs to only one business end user
Business end user	Commercial bank money account	Has Defines the rules allowing a business end user to possess a commercial bank money account



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Entities		Relation	Description
			<ul style="list-style-type: none"> • A business end user can have 0 to many commercial bank money accounts • A commercial bank money account belongs to only one business end user
Business end user	Beta account	Has	<p>Defines the rules allowing a business end user to possess a beta digital euro account</p> <ul style="list-style-type: none"> • A business end user can have 0 to many beta digital euro accounts • A beta digital euro account belongs to only one business end user
Business end user	Technical proof	Owens	<p>Defines the links between a business end user and a technical proof</p> <ul style="list-style-type: none"> • A business end user owns only one technical proof (optional) • A technical Proof is owned by one business end user (optional)
Technical proof	End user entry	Generates	<p>Defines the links between a technical proof and an end user entry</p> <ul style="list-style-type: none"> • A technical proof can generate several business end user entries • A business end user entry is generated by only one technical proof
Business end user	Status	Has	<p>Defines the rules to provide a status</p> <ul style="list-style-type: none"> • A business end user has only one status • A status can be assigned to many business end users
Business end user	Acquiring PSP	Is Serviced by	<p>Defines the links between an acquiring PSP and a business end user</p> <ul style="list-style-type: none"> • A business end user can be serviced by 1 to many acquiring PSP • An acquiring PSP provides services to many business end users
Beta digital euro account	Commercial bank money account	Is Linked To	<p>Defines the links between both accounts.</p> <ul style="list-style-type: none"> • A beta digital euro account is linked to only one commercial bank money account • A commercial bank money account can be linked to 0 or one beta digital euro account
Beta digital euro account	End user entry	Refers to	<p>Defines the links between a beta digital euro account and an end user entry</p> <ul style="list-style-type: none"> • A beta digital euro account refers to one end user entry • An end user entry is linked to only one beta digital euro account
Beta digital euro account	Acquiring PSP	Manages	<p>Defines the links between an acquiring PSP and a beta digital euro account</p> <ul style="list-style-type: none"> • A beta digital euro account is managed by only one acquiring PSP



Entities		Relation	Description
			<ul style="list-style-type: none"> An acquiring PSP is allowed to manage many beta digital euro accounts
Beta digital euro account	Status	Has	<p>Defines the links between a beta digital euro account and a status</p> <ul style="list-style-type: none"> A beta digital euro account has only one status. A status can be assigned to many beta digital euro accounts
Commercial bank money account	Status	Has	<p>Defines the links between a commercial bank money account and a status</p> <ul style="list-style-type: none"> A commercial bank money account has only one status. A status can be assigned to many commercial bank money accounts

2.2.3. Entity description

2.2.3.1. Business end user – pilot PSP space

2.2.3.1.1. Business end user

A business end user, defined as a end user in this chapter, represents a commercial entity, organisation or company that holds an account in beta digital euro and receives transactions through the digital euro system (i.e. merchant).

Identifier and properties

Name	Description
End user identifier	Unique identifier of an end user.
Creation date	Indicates when the user is created – needed for life cycle traceability.
Amendment date	Indicates if modifications have been applied in the end user profile from the creation – needed for life cycle traceability.
Closing date	Indicates since when the end user is disabled – needed for life cycle traceability.

2.2.3.1.2. End user type

An end user type is assigned to an end user to determine if it is an individual end user or a business end user who performs transactions in beta digital euro.

Identifier and properties

Name	Description
End user type identifier	Unique identifier of a type of end user.



End user type	Defines the type of end user (individual end user or business end user)
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2.2.3.1.3. Technical proof

The technical proof is generated at end user onboarding to prove the ownership of the end user's holdings.

Identifier and properties

Name	Description
Technical proof identifier	Unambiguous identification of technical proof.
Technical proof	Technical proof generated for the end user.
Opening date	Indicates when the technical proof is created - needed for life cycle traceability.
Provision date	Indicates when the technical proof is provided to the end user - needed for life cycle traceability.
Closing date	Indicates the date from which the technical proof is no longer valid - needed for life cycle traceability.

2.2.3.1.4. End user entry

An end user entry is used to identify the end user's holding within the settlement ledger.

Identifier and properties

Name	Description
End user entry identifier	Unambiguous identification of an end user entry.
Opening date	Indicates when the end user entry is created - needed for life cycle traceability.
Closing date	Indicates when the end user entry is closed - needed for life cycle traceability.

2.2.3.1.5. Status

A status refers to an operational condition at a given time. It could refer to an end user or an account.

It categorises the end user according to their interaction with their pilot PSP under five possible states: is prospect, is active, is inactive, is suspended or is closed.

For a beta digital euro account, it indicates whether the account is active, inactive, blocked, closed, or subject to specific restrictions.

Identifier and properties

Name	Description
Status identifier	Unique identifier of a status.
Status	Label of a status.



2.2.3.1.6. Point Of Interaction (POI)

A POI refers to either physical location (POS) or virtual location (IP address) where a payment transaction can take place.

A POI can be:

- A POS: a POS is a physical place at which goods and services are sold and paid for, such as shops and restaurants.
- E-commerce: e-commerce is a virtual place at which goods and services are sold and paid for, such as web store checkout page
- M-commerce: a mobile-commerce is a virtual place at which goods and services are sold and paid for, such as mobile app.

Identifier and properties

Name	Description
POI Identifier	Unique identifier of a POI.
POI Type	Define the type of POI.
Legal Entity Identifier	Unique Identifier based on ISO 17442.
Business Identifier	Unique local Identifier (e.g., SIRET in France, Handelsregisternummer in Germany).

The fields listed above must be managed internally by the acquiring PSP solely for purposes of traceability, audit and effective management of the acceptance capabilities.

2.2.3.1.7. Location

The location defines the physical or the virtual place of a POI.

Identifier and properties

Name	Description
Location address type	Defines if the POI is physical or virtual.
Online identifier of the POI	Provides a kind of virtual address of a POI (e.g., domain name, IP address).
Address	Provides the address of a physical POI.
City	Provides the city of a physical POI.
Postal code	Provides the ZIP code of a physical POI.
Country	Provides the Country of a physical POI.
Country code	Provides the Country of a physical POI (ISO 3166-1 numeric).

The fields listed above must be managed internally by the acquiring PSP solely for purposes of traceability, audit and effective management of the acceptance capabilities.

2.2.3.1.8. Activity type

The activity type defines and categorises the different types of commercial activities.



Identifier and properties

Name	Description
Activity Type Identifier	Unique identifier of the activity.
Merchant Category Code	Unique code classifying the merchants according to types of services or goods they provide (ISO 18245 classification).
Merchant Category Label	Label of the Merchant Category Code.
Category	Main categories of merchant category codes (e.g., transportation services, retail outlet services, car rental...).
Creation Date	Indicates when the activity type is created.
Modification Date	Indicates when the activity type is updated.

The fields listed above must be managed internally by the acquiring PSP solely for purposes of traceability, audit, effective management of the acceptance capabilities. Only the Merchant Category Code is transmitted in the payment request, to the DESP and distributing PSP, and it is encrypted.

2.2.3.1.9. Commercial bank money account

A commercial bank money account is a payment account held in the name of one or more end users with a contractual relationship vis-à-vis a pilot PSP and that holds money that is not issued by a central bank.

Identifier and properties

Name	Description
Commercial bank money account number (IBAN)	Unambiguous identification of the commercial bank money account of the end user (payer or payee).
Opening date	Indicates when the commercial bank money account is opened – needed for life cycle traceability.
Closing date	Indicates when the commercial bank money account is closed – needed for life cycle traceability.
Commercial bank money account balance	Provides a numerical representation of commercial bank money account holdings at a specific point in time.
Commercial bank money account balance date	Indicates the date of the commercial bank money account balance.

The fields listed above must be managed internally by the acquiring PSP solely for purposes of traceability, audit, effective management of the acceptance capabilities. The commercial bank money account number (IBAN) is used for external processing with DESP.

2.2.3.1.10. Beta digital euro account

A payment account held by one or more business end users with a pilot PSP to access beta digital euro recorded in DESP to initiate or receive beta digital euro payment transactions, irrespective of technology and data structure.

Identifier and properties

Name	Description
Digital euro access number (DEAN)	Unambiguous identification of the beta digital euro account of the end user (payer or payee).



Name	Description
Opening date	Indicates when the beta digital euro account is opened – needed for life cycle traceability.
Closing date	Indicates when the beta digital euro account is closed – needed for life cycle traceability.
Balance	Provides a numerical representation of beta digital euro account holdings at a specific point in time.
Balance date	Indicates the date of the beta digital euro account balance.

The fields listed above must be managed internally by the acquiring PSP solely for purposes of traceability, audit, effective management of the acceptance capabilities. The digital euro access number (DEAN) is used for external processing with DESP.

2.2.3.1.11. Acceptance instrument

An acceptance device corresponds to an electronic device or electronic system supporting the exchange of information related to beta payment transactions between payer and payee for payment initiation and authentication.

Identifier and properties

Name	Description
Device Identifier	Unique identifier of the device
Device Type	Defines the type of the device (e.g. e-commerce, m-commerce, SoftPOS)
Currency	Default Currency
Language	Default Language
Device IP address	Provides the IP address of the device
Operating System	Provides the operating system running on the device

The fields listed above must be managed internally by the acquiring PSP solely for purposes of traceability, audit, effective management of the acceptance capabilities. This table is provided for illustrative purpose.

2.2.3.1.12. Device capabilities

Device capabilities refer to the types of payment methods and technologies that a payment device or platform can handle. These capabilities define how a customer can initiate and complete a transaction, whether in-store (proximity) or online (e-commerce or m-commerce).

Identifier and properties

Name	Description
Device capability identifier	Unique identifier of a capabilities.
Device capability description	Description of a device capability (e.g., E-commerce payment with alias, Mobile payment NFC with a beta digital euro account).

Device capabilities are requested to enable the processing of the various beta digital euro payment methods.



2.2.3.1.13. Device capabilities details

Device capabilities details refer to the specific configuration parameters associated with a given device capability (such as contactless payment). These details define how a capability is implemented or supported on a particular device.

The device capabilities details and settings are defined based on the device capabilities. Some examples are provided below.

2.2.3.1.14. Mobile Payment NFC with a beta digital euro account

Identifier and properties

Name	Description
Type of trigger for authorization request	Automatic and systematic
AID (RIX et PIX)	A0000009580110
AID Label	Beta digital euro account online AID <i>(to be confirmed)</i>
Terminal capabilities	In accordance with EMVCo standards and based on the capabilities supported by the terminal, the following tags must be configured to enable CPACE HCE transactions with CDCVM support. <u>Byte 2</u> Bit 8: EMV contactless Bit 5: Mobile functionality Bit 3: Consumer device CVM <u>Byte 3</u> Bit 8: Contactless EMV mode
Maximum accepted transaction amount (CENTS)	99999999
Minimum accepted transaction amount (CENTS)	00000001
Terminal Action Code (TAC) Denial	00 00 00 00 00 (no bits set → never decline locally).
Terminal Action Code (TAC) Online	FF FF FF FF FF (all bits set → any issue forces online)
Terminal Action Code (TAC) Default	00 00 00 00 00 → no fallback
POS Rejection Codes and Display Messages	<i>See below — to be translated into the language of the acceptance device.</i>

POS Rejection Codes and Display Messages

Code Meaning	Explanation	POS Display Message
001	Merchant not recognized or authorized	Invalid Merchant
002	Issuer refused the transaction without reason	Do Not Honor
003	General processing error	Error
004	Unsupported or malformed transaction	Invalid Transaction
005	Amount is zero, negative, or unacceptable	Invalid Amount



Code Meaning	Explanation	POS Display Message
006	Token is not valid or recognized	Invalid Token
007	Card issuer could not be identified	No Such Issuer
008	Message format is incorrect or corrupted	Format Error
009	Not enough balance in the account	Insufficient Funds
011	Card not linked to a checking account	No Checking Account
012	Card has expired	Expired Card
013	Card not found in issuer's system	No Card Record
014	Cardholder not allowed to perform this transaction	Transaction Not Permitted to Cardholder
015	Terminal not authorized for this transaction	Transaction Not Permitted to Terminal
016	Transaction flagged as potentially fraudulent	Suspected Fraud
017	A security rule was breached	Security Violation
018	Issuer or network is unavailable	Issuer or Switch Inoperative
019	Transaction could not be routed correctly	Routing Error
020	Transaction blocked due to legal restrictions	Violation of Law
021	Same transaction submitted more than once	Duplicate Transmission
022	Technical failure in the processing system	System Malfunction

2.2.3.1.15. Device capabilities security set

A Device capabilities security set refers to the collection of security features that a device (like a mobile phone, computer, or smart device) can support.

Identifier and properties

Name	Description
Capability Identifier	Unique identifier for the device capability security set
Security Feature	Specific security feature supported (e.g., secure boot, secure storage)

Other attributes need to be managed according to the specific use case and the solution implemented.

2.2.3.1.16. Device technical characteristics

Device technical characteristics refer to the set of measurable and descriptive attributes that define the hardware and software capabilities of an acceptance instrument. These characteristics provide detailed information about the device's performance, functionality, and compatibility.

Identifier and properties

Name	Description
Device Type	Category of the device (e.g., Laptop, Smartphone, Router).
Manufacturer	Name of the device manufacturer.



Name	Description
CPU	Processor used in the device (e.g., Intel i7, Apple M2).
RAM	Installed memory (e.g., 8 GB, 16 GB).
Storage	Internal storage capacity (e.g., 256 GB SSD, 1 TB HDD).
Battery Capacity	Battery capacity (e.g., 4000 mAh, 60 Wh).
Display Size	Screen size in inches (e.g., 13.3", 6.5").
Resolution	Screen resolution (e.g., 1920x1080, 4K).
Operating System	Installed operating system (e.g., Windows 11, Android 14).
Connectivity	Supported connection types (e.g., Wi-Fi, Bluetooth, 5G).
Ports	Available physical ports (e.g., USB-C, HDMI, Ethernet).

The fields listed above must be managed internally by the acquiring PSP. This table is provided for illustrative purpose.

2.2.3.1.17. Keyboard type

A keyboard type refers to the design and input method used on devices like SoftPOS. It defines how end users enter sensitive information such as PIN codes, transaction amounts, or menu selections, and must often meet security and usability standards.

Identifier and properties

Name	Description
Encrypted PIN Pad (epp)	A secure keypad used for PIN entry, typically found on ATMs and unattended payment terminals. It encrypts the PIN at the point of entry.
PCI Compliant Keypad	A keypad that meets PCI (Payment Card Industry) security standards for secure PIN entry and data protection.
Touchscreen Virtual Keypad	A software-based keypad displayed on a touchscreen, often used in modern POS systems and kiosks.
Mechanical Keypad	A physical keypad with tactile feedback, often used in older or rugged payment terminals.
Capacitive Touch Keypad	A flat, touch-sensitive keypad with no moving parts, used in sleek or waterproof payment devices.
Backlit Keypad	A keypad with illuminated keys for visibility in low-light environments, common in outdoor or mobile payment terminals.
Braille-Enabled Keypad	A keypad with Braille markings to support visually impaired users, often required in public payment devices.
Hybrid Keypad	Combines physical and touchscreen elements, allowing both tactile and digital input.
Mobile Device Keyboard	The virtual keyboard on smartphones or tablets used in mobile payment apps (e.g., mPOS).
Custom Function Keypad	Includes programmable keys for specific payment functions (e.g., refund, cancel, loyalty).
No Keyboard	Device without keyboard

The fields listed above must be managed internally by the acquiring PSP solely for purposes of traceability, audit, effective management of the acceptance capabilities



2.2.3.1.18. Customer authentication traceability

Customer authentication traceability refers to the security methods that a payment system or device can use to verify a customer's authentication during a transaction. Possible authentication methods are described in the below table.

Identifier and properties

Name	Description
Two-Factor Authentication (2FA)	Requires two of the following: something the customer knows (e.g., PIN), something the customer has (e.g., phone), or something the customer is (e.g., fingerprint).
Biometric Authentication	Uses physical characteristics such as fingerprint, facial recognition, or iris scan to verify identity.
One-Time Password (OTP)	A temporary code sent via SMS, email, or generated by an app, used to confirm a transaction.
Mobile Push Notification	A push message sent to a registered mobile device requiring user approval for authentication.
Chip and PIN	Card-based authentication requiring a physical card and a personal identification number (PIN).
Behavioural Biometrics	Analyses end user behaviour such as typing rhythm or device interaction patterns to confirm identity.
Device Binding	Links a specific device to an end user account to ensure authentication requests originate from a trusted source.
Knowledge-Based Authentication	Asks the end user to answer personal security questions to verify identity.
No SCA supported	Device without customer authentication management.
No keyboard	Device without keyboard.

The fields listed above must be managed internally by the acquiring PSP solely for purposes of traceability, audit, effective management of the acceptance capabilities.

2.2.3.2. Pilot PSP – DESP space

2.2.3.2.1. Acquiring PSP

An acquiring PSP is a pilot PSP offering pilot payment services to its business end users.



2.3. Payment Data

2.3.1. Model

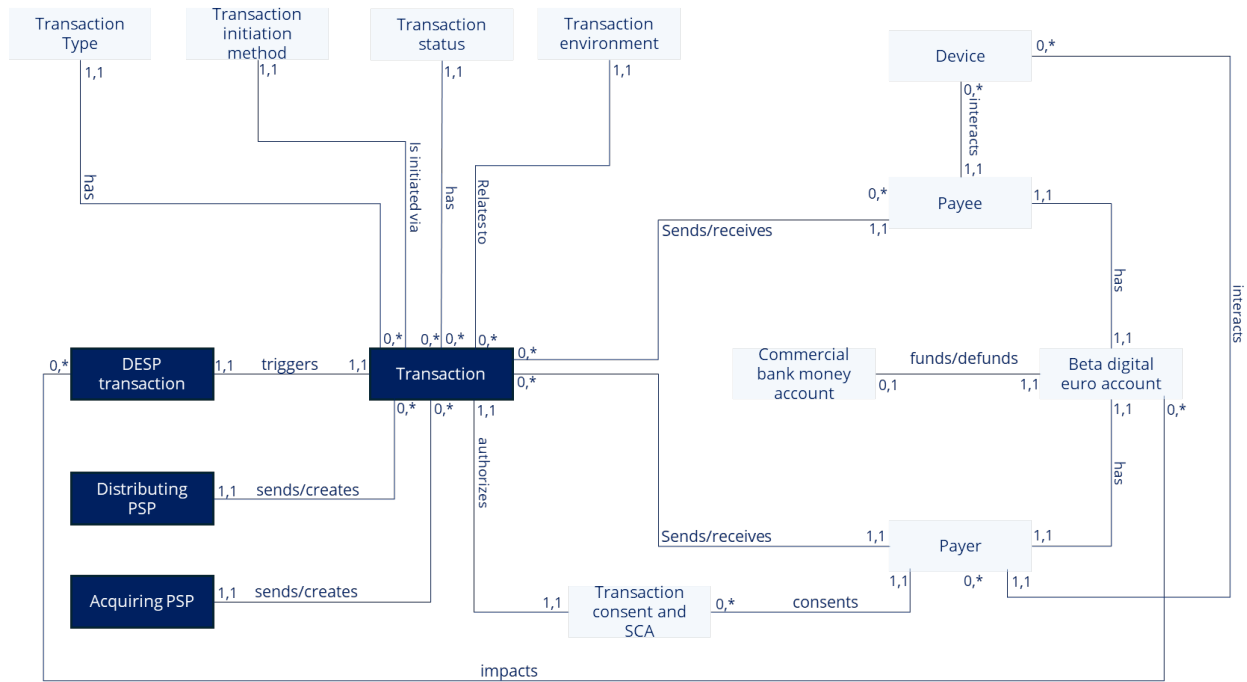


Figure 4 Payment data model

2.3.2. Relations between entities

Entities	Relation	Description
Transaction	Type	has Defines the rules to classify a transaction. <ul style="list-style-type: none"> • A Transaction has only one type • A Type can be assigned to 0 to many transactions
Transaction	Status	has Defines the rules to provide a status <ul style="list-style-type: none"> • A Transaction has only one status • A status can be assigned to 0 to many transactions
Transaction	Communication technology	is initiated via Defines the rules to identify the communication technology <ul style="list-style-type: none"> • A transaction has only one communication technology ▪ A communication technology can be used by 0 to many transactions
Transaction	Environment	relates to Defines the rules to identify the environment <ul style="list-style-type: none"> • A transaction relates to only one environment • An environment can be linked to 0 to many transactions
Transaction	Payee	sends/receives Defines the link between a transaction and a payee <ul style="list-style-type: none"> • A transaction is sent/received by only one payee. • A payee can send or receive 0 to many transactions



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Entities	Relation	Description
Transaction	Payer	sends/receives Defines the link between a transaction and a payer <ul style="list-style-type: none"> • A transaction is sent or received by only one payer. • A payer can send/receive 0 to many transactions
Transaction	Consents & SCA	authorizes Defines the rules applied to authorize a transaction <ul style="list-style-type: none"> • A transaction is authorized by only one consent. • A consent is assigned to only one transaction.
Transaction	DESP Transaction	triggers Defines the link between a transaction and a DESP transaction <ul style="list-style-type: none"> • A transaction triggers only one DESP transaction. • A DESP transaction is linked to only one transaction.
Transaction	Distributing PSP	sends/creates Defines the way a distributing PSP is linked to a transaction <ul style="list-style-type: none"> • A distributing PSP can send/create many transactions. • A transaction is sent, created by only one distributing PSP.
Transaction	Acquiring PSP	sends/creates Defines the way an acquiring PSP is linked to a transaction <ul style="list-style-type: none"> • An acquiring PSP can send/create many transactions. • A transaction is sent, created by only one acquiring PSP.
Payer	Consents & SCA	consents Defines the rules applied to a payer who authorizes a transaction. <ul style="list-style-type: none"> • A payer can consent to many transactions through consents & SCA. • Consents & SCA are given by only one payer.
Payer	Beta digital euro account	has Defines the rules allowing a payer to own a beta digital euro account <ul style="list-style-type: none"> • A payer can have 1 to many beta digital euro accounts <i>(we don't differentiate Individual end user and Business end user)</i> • A beta digital euro account belongs to only one payer.
Payer	Payment instrument	Interacts Defines the way the payment instrument can be used by a payer. <ul style="list-style-type: none"> • A payer can interact with 1 to many payment instruments • A payment instrument is used by only to one payer
Payee	Payment instrument	interacts Defines the way the payment instrument can be used by a Payee. <ul style="list-style-type: none"> • A Payee can interact with 1 to many payment instruments • A Device is used by only to one payment instrument
Payee	Beta digital euro account	Has Defines the rules allowing a payee to possess a beta digital euro account <ul style="list-style-type: none"> • A payee can have 1 to many beta digital euro accounts <i>(we don't differentiate individual end user and business end user)</i>. • A beta digital euro account belongs to only one payee.



Entities	Relation	Description
Beta digital euro account Commercial bank money account	funds/defunds	Defines the links between both accounts for funding & defunding. <ul style="list-style-type: none"> • A beta digital euro account can be funded and defunded from one commercial bank money account or defunded to a commercial bank money account. • A commercial bank money account can fund or defund only one beta digital euro account.
Beta digital euro account DESP transaction	Impacts	Defines how transactions are reflected in beta digital euro accounts <ul style="list-style-type: none"> • A beta digital euro account can be impacted by many transactions. • A transaction can impact many beta digital euro accounts (debited and credited accounts).

2.3.3. Entity description

2.3.3.1. End user – pilot PSP space

2.3.3.1.1. Payment instrument

A payment instrument is a component used by an end user which can offer pilot payment services. Payment instruments can be used for online payments, offline payments, or both.

In the context of the pilot, a payment instrument is a mobile app - a software application that allows the end user to pay with beta digital euro.

Identifier and properties

Name	Description
Device Identifier	Unique identifier of a device.
Device Type	Defines the type of device.
Device IP address	Provides the IP address of the device.

2.3.3.1.2. Transaction

A transaction is the representation of a financial exchange between actors (funding, defunding, recurring payments, reservation, payments, financial capture, purchase, withdrawal, other payments).

Identifier and properties

Name	Description
Transaction identifier	Unique Identifier of the transaction assigned by the pilot PSP to a transaction for its own need
End-to-end transaction identifier	Unique identifier of a transaction known by both pilot PSPs
Transaction amount	Corresponds to the amount of money transferred by the payer to the payee



Name	Description
Transaction date/time	Represents the specific point in time when the transaction is created
Transaction direction	Indicates whether the transaction increases (credit) or decreases (debit) the payee's holdings.
Transaction currency	Corresponds to the amount of money transferred by the payer to the payee
Transaction information	Corresponds to additional information that could be entered by the end user when a transaction is initiated.

2.3.3.1.3. Type

A type is a specific category or classification of transaction.

Identifier and properties

Name	Description
Type identifier	Unique identifier of a type
Type	Label of a type <ul style="list-style-type: none">- Purchase- Refund- Account to Account

2.3.3.1.4. Communication technology

A communication technology corresponds to the initiation method chosen by the end user to initiate a payment transaction.

Identifier and properties

Name	Description
Communication technology identifier	Unique identifier of a communication technology
Communication technology	Label of a communication technology <ul style="list-style-type: none">- Alias- DEAN- NFC

2.3.3.1.5. Status

A status is a representation of the state of a transaction according to its life cycle.

Identifier and properties

Name	Description
Status identifier	Unique identifier of a status (reason code)
Status	Label of a status



2.3.3.1.6. Environment

An environment indicates the context of a transaction.

Identifier and properties

Name	Description
Environment identifier	Unique identifier of an environment
Environment	Label of an environment <ul style="list-style-type: none">- P2P transaction- E-commerce transaction- M-commerce transaction- Refund

2.3.3.1.7. Payee

A payee is a party in a payment that receives a payment from a payer, the creditor of the transaction. A payee can be an individual end user or a business end user.

Identifier and properties

Name	Description
Payee identifier	Unique identifier of a payee

2.3.3.1.8. Payer

A payer is a party in a payment that agrees to the payment to the payee, the debtor of the transaction. A payer might be an individual end user or a business end user.

Identifier and properties

Name	Description
Payer identifier	Unique identifier of a payer

2.3.3.1.9. Commercial bank money account

A commercial bank money account is a payment account held in the name of one or more end users with a contractual relationship vis-à-vis a pilot PSP and that holds money that is not issued by a central bank.

Identifier and properties

Name	Description
Commercial bank money account number (IBAN)	Unambiguous identification of the commercial bank money account of the end user (payer or payee).
Opening date	Indicates when the commercial bank money account is opened - needed for life cycle traceability.



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Name	Description
Closing date	Indicates when the commercial bank money account is closed - Needed for life cycle traceability
Commercial bank money account balance	Provides a numerical representation of commercial bank money account holdings at a specific point in time.
Commercial bank money account balance date	Indicates the date of the commercial bank money account balance

2.3.3.1.10. Beta digital euro account

A payment account held by one or more end users with a pilot PSP to access beta digital euro recorded in the digital euro settlement infrastructure to initiate or receive beta digital euro payment transactions, irrespective of technology and data structure.

Identifier and properties

Name	Description
Digital euro access number (DEAN)	Unambiguous identification of the beta digital euro account of the end user (payer or payee).
Opening date	Indicates when the beta digital euro account is opened - needed for life cycle traceability.
Closing date	Indicates when the beta digital euro account is closed - needed for life cycle traceability.
Beta digital euro account balance	Provides a numerical representation of beta digital euro account holdings at a specific point in time.
Beta digital euro account balance date	Indicates the date of the beta digital euro account balance

2.3.3.1.11. Consent and SCA

A consent is given by the payer for the processing of the payment.

Identifier and properties

Name	Description
Consent identifier	Unique identifier of the consent.
Consent status	Indicates if the consent is given or not.

2.3.3.2. Pilot PSP – DESP space

2.3.3.2.1. DESP transaction

A DESP transaction, managed by DESP space, could be a payment or a funding or a defunding, or a reservation or a combination of the previous (e.g., a payment that requires a defunding).



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2.3.3.2.2. Distributing PSP

A distributing PSP is a pilot PSP offering to its individual end user pilot payment services.

2.3.3.2.3. Acquiring PSP

An acquiring PSP is a pilot PSP offering to its individual end user pilot payment services.



3. Data Dictionary

In this chapter are listed all the data elements (attributes) identified to support beta digital euro across services and functions. The data elements are listed in alphabetic order and associated with processes that use them. Each element is described according to the tables presented hereafter.

3.1. Data element definition

Element	Definition, annotation and example
Attribute ID	Identifier of the data element
Data element name	Name of data element
Description	Detailed presentation of the data that can include examples
Data Type (Format)	Format of the data allowing the system to interact with the data and its value
Valid data attributes	Set of possible values for data
Maximum data element length	Maximum number of characters
New for beta digital euro	New data to be handled to support beta digital euro
Used by internal process only	Data used by a process
Visible to the end user	Data entered by the end user or displayed to the end user

3.2. Data types

Data type	Description
String (STR)	Sequence of characters that can be a letter, a digit, a blank space, a punctuation mark (Alphanumeric)
Number (NUM)	Numeric characters only
Boolean (BOOL)	Represents the value True and False
String Set (SSET)	List of applicable attributes
Number Set (NSET)	List of applicable numbers
Number range	A numeric range for a data
Date	Date format YYYY-MM-DD
UTC Time	UTC time including milliseconds HHMMSSsss
Datetime UTC	Date and time format in UTC YYYY-MM-DDThh:hh:sssZ
Binary (BIN)	Method of encoding data using sequences of bits
UUID	Universally Unique Identifier xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx



3.3. List of data elements

The table below presents all the data elements along with the processes in which they are used.

Attribute Identifier	Data name	Used in	
AT#	Aggregated notifications frequency	Access Management	AM-1.2 Onboarding of a Business end user
AT#	Aggregated notifications indicator	Access Management	AM-1.2 Onboarding of a Business end user
AT#	Alias ownership indicator	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-4.1.x End user (individual) amendments
AT#	Amount	Liquidity Management	LM-1.1 Online manual funding LM-2.1 Online manual defunding
AT#	Amount, Authorized	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Amount, Other	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Application cryptogram	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Application Transaction Counter (ATC)	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Authorization end-date	Transaction Management	TM-4 All Recurring payment processes TM-5. All Pre-authorization on e-commerce processes
AT#	Commercial bank money account	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-4.1.x End user (individual) amendments
		Liquidity Management	LM-1.1 Online manual funding LM-2.1 Online manual defunding
		Transaction Management	All processes
AT#	Commercial bank money account balance	Transaction Management	All processes
AT#	Commercial bank money account credited amount	Liquidity Management	LM-1.1 Online manual funding
Transaction Management		LM-2.1 Online manual defunding All processes	
AT#	Commercial bank money account debited amount	Liquidity Management	LM-1.1 Online manual funding
		Transaction Management	LM-2.1 Online manual defunding All processes
AT#	Communication channel type	Transaction Management	TM-2.3 E-commerce payment with pay-by-link
		Transaction Management	TM-4.1.2 Recurring e-commerce payment with pay-by-link
		Transaction Management	TM-5.2.2 Pre-authorization on e-commerce with pay-by-link
AT#	Communication channel value	Transaction Management	TM-2.3 E-commerce payment with pay-by-link



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Attribute Identifier	Data name	Used in	
		Transaction Management	TM-4.1.2 Recurring e-commerce payment with pay-by-link
		Transaction Management	TM-5.2.2 Pre-authorization on e-commerce with pay-by-link
AT#	Credited Account Identification	Liquidity Management	LM-1.1 Online manual funding LM-2.1 Online manual defunding
AT#	Credited Account Pilot PSP Identification	Liquidity Management	LM-1.1 Online manual funding LM-2.1 Online manual defunding
AT#	Cryptogram Information Data	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	CVM Results	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Date of the message	Transaction Management	All processes
AT#	DEAN last four digits	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Debited Account Identification	Liquidity Management	LM-1.1 Online manual funding LM-2.1 Online manual defunding
AT#	Debited Account Pilot PSP Identification	Liquidity Management	LM-1.1 Online manual funding LM-2.1 Online manual defunding
AT#	Defunding amount	Transaction Management	All processes
AT#	Delivery Address	Transaction Management	All processes
AT#	Delivery Date	Transaction Management	All processes
AT#	Beta digital euro balance	Transaction Management Liquidity Management	All P2P and e/m-commerce transactions TM-9.1 Balance enquiry mobile App – Online Balance LM-1.1 Online manual funding LM-2.1 Online manual defunding
AT#	Beta digital euro balance date	Transaction Management Liquidity Management	All P2P and e/m-commerce transactions TM-9.1 Balance enquiry mobile App – Online Balance LM-1.1 Online manual funding LM-2.1 Online manual defunding
AT#	Beta digital euro balance type	Transaction Management	TM-9.1 Balance enquiry mobile App – Online Balance
AT#	Credit event aggregation frequency	Access Management	AM-1.2 Onboarding of Business end user
AT#	Credit event aggregation indicator	Access Management	AM-1.2 Onboarding of Business end user
AT#	Credit event indicator	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-4.1.x End user (individual) amendments
AT#	Debit event aggregation frequency	Access Management	AM-1.2 Onboarding of business end user
AT#	Debit event aggregation indicator	Access Management	AM-1.2 Onboarding of business end user
AT#	Debit event indicator	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user



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Attribute Identifier	Data name	Used in	
			AM-4.1.x End user (individual) amendments
AT#	Contract identifier	Access Management	AM-1.2 Onboarding of business end user
AT#	Digital euro access number (DEAN)	Transaction Management Liquidity Management Access Management	All TM and LM processes AM-1.1 & sAM-26 Onboarding of individual end user AM-4.1.x End user (individual) amendments
AT#	Beta digital euro account status	Transaction Management	All P2P and e/m-commerce transactions
AT#	Beta digital euro account credited amount	Transaction Management	All processes
AT#	Beta digital euro account debited amount	Transaction Management	All processes
AT#	User Status	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user
AT#	User Type	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-1.2 Onboarding of business end user
AT#	Identifier of the event	Transaction Management	All processes
AT#	Distributing PSP ID	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Funds release	Transaction Management	All processes
AT#	Holding limit	Access Management Liquidity Management Transaction Management	AM-1.1 & sAM-26 Onboarding of individual end user LM-1.1 Online manual funding All processes
AT#	Holdings limit indicator	Transaction Management	All processes
AT#	Identifier of the user	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-1.2 Onboarding of business end user
AT#	Identifier of the incoming message	Transaction Management	All processes
AT#	Identifier of the message	Transaction Management	All processes
AT#	Incremental amount to be defunded	Transaction Management	All processes
AT#	Indicator of already existing DEAN	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user
AT#	Issuer Application Data	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Language	Transaction Management	All processes
AT#	Linked account indicator	Transaction Management	All processes
AT#	Merchant Category Code	Transaction Management	All E-commerce transactions
AT#	Merchant DEAN	Transaction Management	All E-commerce transactions
AT#	Merchant identification	Transaction Management	All E-commerce transactions
AT#	Number of beta digital euro accounts to open	Access Management	AM-1.2 Onboarding of business end user
AT#	Original transaction identifier	Transaction Management	TM-7.2 Refund (e-commerce)



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Attribute Identifier	Data name	Used in	
AT#	Payee Alias type	Transaction Management	TM3 – P2P payments
AT#	Payee Alias value	Transaction Management	TM3 – P2P payments
AT#	Payee DEAN	Transaction Management	TM3 – P2P payments
AT#	Payee location (address)	Transaction Management	All E-commerce transactions
AT#	Payee's location (City)	Transaction Management	All E-commerce transactions
AT#	Payee's location (Post code)	Transaction Management	All E-commerce transactions
AT#	Payee's location (Country)	Transaction Management	All E-commerce transactions
AT#	Payee name	Transaction Management	TM3 – P2P payments
		Transaction Management	All E-commerce transactions
AT#	Payee pilot PSP ID	Transaction Management	All processes
AT#	Payee trade name	Transaction Management	All E-commerce transactions
AT#	Payer Alias type	Transaction Management	TM3 – P2P payments
		Transaction Management	TM-2.2 E-commerce payment with alias or DEAN
AT#	Payer Alias value	Transaction Management	TM3 – P2P payments
		Transaction Management	TM-2.2 E-commerce payment with alias or DEAN
AT#	Payer DEAN	Transaction Management	TM3 – P2P payments
AT#	Payer name	Transaction Management	TM3 – P2P payments
AT#	Payer pilot PSP ID	Transaction Management	All processes
AT#	Pilot PSP identification	Transaction Management	TM-2.2 E-commerce payment with alias or DEAN TM-3.10 & TM-3.11 P2P payments with DEAN
AT#	Reason Code	Transaction Management	All processes
AT#	Return Code	Transaction Management	All processes
AT#	Reverse waterfall aggregation frequency	Access Management	AM-1.2 Onboarding of business end user
AT#	Reverse waterfall event aggregation indicator	Access Management	AM-1.2 Onboarding of business end user
AT#	Reverse waterfall indicator	Transaction Management	P2P and e/m-commerce transactions with reverse waterfall
AT#	Reverse waterfall transaction event indicator	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-4.1.x End user (individual) amendments
AT#	Structured remittance	Transaction Management	All E-commerce transactions
AT#	Technical proof	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-1.2 Onboarding of business end user
AT#	Terminal country code (9F1A)	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Terminal Transaction Date (9A)	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile



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Attribute Identifier	Data name	Used in	
AT#	Terminal type (9F35)	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Terminal Verification results – TVR	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Threshold based transaction event indicator	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-4.1.x End user (individual) amendments
AT#	Token	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Transaction amount	Transaction Management	TM3 – P2P payments
		Transaction management	All E-commerce transactions
AT#	Transaction currency	Transaction management	TM3 – P2P payments
		Transaction management	All E-commerce transactions
AT#	Transaction currency code (5F2A)	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Transaction date	Transaction Management	TM3 – P2P payments
		Transaction Management	All E-commerce transactions
AT#	Transaction end date	Transaction Management	TM-3.9 Transactions history
AT#	Transaction Identification	Transaction Management	TM3 – P2P payments
		Transaction Management	All E-commerce transactions
AT#	Transaction communication technology	Transaction Management	TM3 – P2P payments
		Transaction Management	All E-commerce transactions
AT#	Transaction start date	Transaction Management	TM-3.9 Transactions history
AT#	Transaction type	Transaction Management	TM3 – P2P payments
		Transaction management	All E-commerce transactions
AT#	Transaction Type (9C)	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Type of Alias	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-4.1.x End user (individual) amendments - Alias registration
AT#	Type of Credited Account	Liquidity Management	LM-1.1 Online manual funding LM-2.1 Online manual defunding
AT#	Type of Debited Account	Liquidity Management	LM-1.1 Online manual funding LM-2.1 Online manual defunding
AT#	Type of new account	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user
AT#	Unpredictable number (9F37)	Transaction Management	TM-1.6 Online contactless SoftPOS payment with mobile
AT#	Unstructured remittance	Transaction Management	All P2P and e/m-commerce transactions
AT#	Urgency level	Transaction Management	All processes
AT#	Value of Alias	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user



Attribute Identifier	Data name	Used in	
			AM-4.1.9 End user (individual) amendments – Alias registration
AT#	Waterfall aggregation frequency	Access Management	AM-1.2 Onboarding of business end user
AT#	Waterfall event aggregation indicator	Access Management	AM-1.2 Onboarding of business end user
AT#	Waterfall indicator	Transaction management	P2P and e/m-commerce transactions with reverse waterfall
AT#	Waterfall transaction event indicator	Access Management	AM-1.1 & sAM-26 Onboarding of individual end user AM-4.1.x End user (individual) amendments

3.4. Data elements description

The table below consolidates all the data identified as required for the various processes described in the other specification documents.

Note: Amount-related data elements (transaction amount, balance, threshold, ...) are defined using the NUM 18 format (except for EMV data). This format supports decimal values (The number of fractional digits must comply with currency code - ISO 4217). The decimal separator is a dot.

#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
AT#	Aggregated notifications frequency	Specifies the applicable frequency for aggregated notifications	SSET	Refer to ISO Frequency7Code	4	X	X	X
AT#	Aggregated notifications indicator	Specifies whether the end user requests aggregated notifications compiling all the events	BOOL	0 - Aggregated notifications are not set 1 - Aggregated notification are set	1	X	X	X
AT#	Alias ownership indicator	Indicator validating the alias ownership	BOOL	0 - the ownership is not validated 1 - the ownership is validated	1	X	X	X
AT#	Amount	Amount of money to be transferred between a payer and a payee	NUM		18		X	X
AT#	Amount, Authorised (9F02)	Amount authorized by the distributing PSP	NUM		12		X	
AT#	Amount, Other (9F03)	Part of amount authorized reserved for cashback	NUM		12		X	
AT#	Application Cryptogram (9F26)	Cryptographic code generated by the EMV card to authenticate a transaction with the issuing bank	BIN		8		X	



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
AT#	Application Transaction Counter (ATC) (9F36)	Two-byte EMV value that counts the number of transactions performed by the card, incrementing with each new transaction to help detect fraud or replay attacks.	NUM		4		X	
AT#	Authorization end-date	Date defining the end of the validity period of the authorization	DATE		10		X	X
AT#	Card Application Identifier	The Application Identifier (AID) is a unique identifier assigned to each payment application on a chip card. It allows the terminal to recognize and select the appropriate application during a transaction.	BIN	A0000009580110	16		X	
AT#	Commercial bank money account	Identification of the commercial bank money account (IBAN)	STR		34		X	X
AT#	Commercial bank money account balance	Total amount of money held in a commercial bank money account at a specific date	NUM		18		X	X
AT#	Commercial bank money account credited amount	Amount to be credited to the commercial bank money account. Populated only if the defunding settlement is successful	NUM		18		X	
AT#	Commercial bank money account debited amount	Amount to be debited from the commercial bank money account. Populated only if the funding settlement is successful	NUM		18		X	
AT#	Communication channel type	A classification defining the channel to use to communicate with the end user	SSET	EMAL (transmission by email) ONLI (transmission online – e.g., inApp) MBNO (transmission by mobile phone) MULT (Multichannel) FILE (transmission by file transfer) Code set to be confirmed	4		X	X



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
AT#	Communication channel value	Detail information of the method that is chosen by the end user to receive communication	STR		140		X	X
AT#	Credited Account Identification	Identification of the account that is credited	STR		34	X	X	X
AT#	Credited Account PSP Identification	Identifier of the pilot PSP (BIC) servicing the credited account	STR		11		X	
AT#	Cryptogram Information Data (9F27)	One-byte EMV field that indicates the type of cryptogram generated by the card and the status of issuer authentication during a transaction	BIN		1		X	
AT#	CVM Results (9F34)	The CVM (Cardholder Verification Method) Result is returned by the card after processing the terminal's CVM list and attempting cardholder verification (e.g., PIN, signature, no CVM required, etc.).	BIN		3		X	
AT#	Date of the message	Date time of the message creation YYYY-MM-DDThh:hh:sssZ	DATETIME UTC		24		X	
AT#	DEAN last four Digits	DEAN last four digits to be print on the payment receipt.	NUM		4	X		X
AT#	Debited Account Identification	Identification of the account that is debited	STR		34	X	X	X
AT#	Debited Account PSP Identification	Identifier of the pilot PSP (BIC) servicing the debited account	STR		11		X	
AT#	Defunding amount	Defunding amount in the case of a combined transaction on the payee side or a manual liquidity management defunding request.	NUM		18	X	X	
AT#	Delivery address	Clients phone number or e-mail address. Type depends on delivery channel type.	STR		100		X	
AT#	Delivery date	Date of notification needed to be delivered. Format DD.MM.YYYY	STR		10		X	
AT#	Beta digital euro account balance	Total amount of money held in a beta digital euro account at a specific date	NUM		18	X	X	X



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
AT#	Beta digital euro account balance type	Specifies the nature of the balance.	SSET	AVLB - Available	4		X	X
AT#	Beta digital euro account credit event aggregation frequency	Specifies the applicable frequency for aggregated beta digital euro credit event notifications	SSET	Refer to ISO Frequency7Code	4	X	X	X
AT#	Beta digital euro account credit event aggregation indicator	Specifies whether the end user requests aggregated notifications for beta digital euro account credit event	BOOL	0 - Aggregated event is not set 1 - Aggregated event is set	1	X	X	X
AT#	Beta digital euro account credit event indicator	Specifies whether a notification is triggered when the beta digital euro account is credited.	BOOL	0 - Event notification is not set 1 - Event notification is set	1	X	X	X
AT#	Beta digital euro account debit event aggregation frequency	Specifies the applicable frequency for aggregated beta digital euro debit event notifications	SSET	Refer to ISO Frequency7Code	4	X	X	X
AT#	Beta digital euro account debit event aggregation indicator	Specifies whether the end user requests aggregated notifications for beta digital euro account debit event	BOOL	0 - Aggregated event is not set 1 - Aggregated event is set	1	X	X	X
AT#	Beta digital euro account debit event indicator	Specifies whether a notification is triggered when the beta digital euro account is debited.	BOOL	0 - Event notification is not set 1 - Event notification is set	1	X	X	X
AT#	Digital euro access number (DEAN)	Unique identifier of the digital euro access number	STR		18	X	X	X
AT#	Beta digital euro account status	A representation of the state of a beta digital euro account according to its life cycle	SSET	ACTV - Active BLCK - Blocked CLSD - Closed SSPD – Suspended Code set to be confirmed	4	X	X	
AT#	Beta digital euro contract identifier	Unique identifier of the contract to be closed	STR		TBD		X	
AT	Beta digital euro account upcoming balance	Indicates the amount of money available on the beta digital euro account including	NUM		18	X	X	X



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
		reserved funds, upcoming standing orders and upcoming recurring payments.						
AT#	Beta digital euro account upcoming balance indicator	Indicator confirming wether upcoming balance must be retrieved	BOOL		1	X	X	X
AT#	Beta digital euro account credited amount	The amount to be credited to the beta digital euro account	NUM		18	X	X	
AT#	Beta digital euro account debited amount	The amount to be debited from the beta digital euro account	NUM		18	X	X	
AT#	User Status	A representation of the state of a user according to their life cycle	SSET	PEND – Pending ACTV – Active CLSD - Closed Code set to be defined	4	X	X	X
AT#	User Type	Indicated the type of user as specified by the pilot PSP	SSET	INDI - Individual BUSI - Business	4	X	X	
AT#	Funding amount	Funding amount in the case of a combined transaction on the payer side or a manual liquidity management funding request.	NUM		18	X	X	
AT#	Funds release	Amount to be released from the commercial bank money account	NUM		18		X	
AT#	Holding limit	Maximum amount of beta digital euro that can be held by an individual end user	NUM		18	X	X	X
AT#	Holdings limit indicator	Dedicated indicator defining if the holdings limit setting is requested and must be communicated	BOOL	0 - Corresponding setting is not requested 1 - Corresponding setting is requested	1	X	X	X
AT#	Identifier of the event	Unique identifier of the event that triggers the message	STR		35		X	
AT#	Identifier of the user	Unique identifier of the user	STR		TBD	X	X	X
AT#	Identifier of the incoming message	Unique identifier of the corresponding incoming message	STR		35		X	
AT#	Identifier of the message	Unique identifier of message	STR		35		X	



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
AT#	Incremental amount to be defunded	The incremental amount to be defunded from the beta digital euro account	NUM		18	X	X	
AT#	Indicator of already existing DEAN	Indicator precisng whether an already existing account is found	BOOL	0 - if no existing account is found 1 - if an existing account is found	1	X	X	
AT#	Issuer Application Data (9F10)	Cryptogram version number	BIN		1		X	
		DKI (Derivation Key Index)	BIN		1		X	
		Other data to be defined	BIN		30		X	
AT#	Language	Dictionary language name of notification message	SSET	Refer to ISO 639	2		X	X
AT#	Linked account indicator	Dedicated indicator defining if a commercial bank money account is linked to the beta digital euro account	BOOL	0 - indicates no link 1 - indicates that a link exists	1	X	X	
AT#	Merchant Category Code	Four-digit code that classifies the business type of the merchant	NSET	Refer to ISO 18245	4			
AT#	Merchant DEAN	Unique identifier of the digital euro access number of the merchant in a transaction	STR		18	X	X	X
AT#	Merchant identification	Unique identifier of a merchant	STR		35		X	
AT#	Number of beta digital euro accounts to open	Number of DEAN the business end user wants to open	NUM		3	X	X	X
AT#	Original transaction identifier	Unique identifier of the original transaction in case of refund	STR		35		X	X
AT#	Payee alias type	A classification defining a pseudonymous account identifier of the payee	SSET	Refer to ISO external Code "ExternalProxyAccountType1code" EMAL (e-mail address) MBNO (Mobile phone number)	4		X	X
AT#	Payee alias value	A pseudonymous account identifier of the payee used in a transaction	STR		2048		X	X
AT#	Payee DEAN	Unique identifier of the digital euro access number of the payee in a transaction	STR		18	X	X	X
AT#	Payee location (address)	Full address of the payee, including street name and number.	STR		70		X	X
AT#	Payee location (city)	City where the payee is located.	STR		35		X	X



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
AT#	Payee location (country)	Country where the payee resides or is registered	SSET	Refer to ISO 3166	2		X	X
AT#	Payee location (ZIP code)	Postal code corresponding to the payee's address.	STR		16		X	X
AT#	Payee name	Name of the end user that is the payee in a transaction	STR		70		X	X
AT#	Payee PSP ID	Pilot PSP ID of the payee	STR		11		X	X
AT#	Payee trade name	The commercial name under which the payee operates, which may differ from their legal name.	STR		25		X	X
AT#	Payer alias type	A classification defining a pseudonymous account identifier of the payer	SSET	Refer to ISO external Code "ExternalProxyAccountType1code" EMAL (e-mail address) MBNO (Mobile phone number)	4		X	X
AT#	Payer alias value	A pseudonymous account identifier of the payer used in a transaction	STR		2048		X	X
AT#	Payer DEAN	Unique identifier of the digital euro access number of the payer in a transaction	STR		18	X	X	X
AT#	Payer name	Name of the end user that is the payer in a transaction	STR		70		X	X
AT#	Payer PSP ID	Pilot PSP ID of the payer	STR		11		X	X
AT#	Payment link	Secure link enabling end user to make a payment.	URL				X	X
AT#	PSP identification	Unique identifier of the pilot PSP servicing the beta digital euro account (BIC)	STR		11		X	X
AT#	Reason code	Populated only in case of rejection and corresponds to the rejection root cause.	NSET		4		X	
AT#	Reference	The reference is a unique identifier returned by the HCE SDK backend after a successful NFC enrollment preparation request. It serves as a secure handle that the pilot PSP	UUID		36		X	



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
		app uses to initiate or continue the NFC enrollment process with the HCE SDK.						
AT#	Refund Amount	The amount to be refunded by the merchant.	NUM		18		X	X
AT#	Return code	Exit code of function providing the status that the process returns when executed.	BOOL	0 – If the function execution is successful 1 – If the function execution is failed	1		X	
AT#	Reverse waterfall aggregation frequency	Specifies the applicable frequency for aggregated reverse waterfall event notifications	SSET	Refer to ISO Frequency7Code	4	X	X	X
AT#	Reverse waterfall event aggregation indicator	Specifies whether the end user requests aggregated notifications for reverse waterfall event	BOOL	0 - Corresponding setting is not requested 1 - Corresponding setting is requested	1	X	X	X
AT#	Reverse waterfall indicator	Dedicated indicator defining if the end user opts for reverse waterfall	BOOL	0 - Reverse waterfall is not set 1 - Reverse waterfall is set	1	X	X	X
AT#	Reverse waterfall transaction event indicator	Dedicated indicator specifying whether a notification is triggered when a reverse waterfall process affects the beta digital euro account.	BOOL	0 - Corresponding setting is not requested 1 - Corresponding setting is requested	1	X	X	X
AT#	Settlement confirmation status	Indicator specifying whether the DESP settlement confirmation status is successful or failed.	BOOL	0 - Successfull 1 - Failed	1		X	
AT#	Structured remittance Reference	Predefined code/value provided by the payee to the payer, facilitating automated reconciliation.						X
	Reference Type		STR		35			X
	Reference Issuer		STR		35			X
			STR		35			X
AT#	Technical proof	Cryptographic root key used to prove the ownership of holdings.	STR		TBD	X	X	X
AT#	Terminal country code (9F1A)	Terminal country code	NUM		4		X	
AT#	Terminal Transaction Date (9A)	Terminal Transaction Date	NUM		6		X	
AT#	Terminal type (9F35)	Terminal Type	NUM	Refer to EMV Book 4 for possible values	2		X	



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
AT#	Terminal Verification results – TVR	Terminal Verification results	BIN		5		X	
AT#	Token	Provided by CPACE-HCE processing over the contactless interface	NUM	To be decided for beta digital euro but should be 16 digits	16		X	
AT#	Transaction amount	Amount of money transferred by a payer to a payee in a transaction	NUM		18		X	X
AT#	Transaction currency	Currency associated with the transaction	SSET	Refer to ISO 4217	3		X	X
AT#	Transaction currency code (5F2A)	Transaction currency code	NUM		4		X	
AT#	Transaction date	Date and time of when the transaction is initiated. YYYY-MM-DDThh:hh:sssZ	DATETIME UTC		24			X
AT#	Transaction end date	End date of the search period for transactions history	DATE		10		X	X
AT#	Transaction identification	Unique and unambiguous code to identify a transaction	STR		35		X	X
AT#	Transaction communication technology	Method chosen by the individual end user to initiate a payment transaction	SSET	- Alias - DEAN Code set to be defined	4	X	X	X
AT#	Transaction start date	Start date of the search period for transactions history	DATE		10		X	X
AT#	Transaction type	Specific classification or categorization assigned to a financial transaction based on purpose, nature, or category of the exchange.	SSET	- PP01: P2P payment - PB01: POI payment – e-com / POS - BP01: B2P payment - FU01: Funding - DF01: Defunding	4		X	
AT#	Transaction Type (9C)	EMV Transaction type	NUM		2		X	
AT#	Type of alias	Classification defining a pseudonymous account identifier	SSET	Refer to ISO external Code - EMAL (e-mail address) - MBNO (Mobile phone number)	4		X	X



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
AT#	Type of Credited Account	Type of account that is credited	SSET	- CBMA (Commercial bank money account) - DEUR (Beta digital euro account)	4	X	X	X
AT#	Type of Debited Account	Type of account that is debited	SSET	- CBMA (Commercial bank money account) - DEUR (Beta digital euro account)	4	X	X	X
AT#	Type of request	Used to identify and classify the nature of the request or operation to be performed	SSET	- ONLF (Online funding request) - ONLD (Online defunding request) - CRED (Settings creation request) - UPDT (Settings update request) - DELT (Settings deletion request) - UNBL (Unblocking account request) - BLCK (Blocking account request) Code set to be confirmed	4		X	X
AT#	Type of the new account	Type of account to be opened	SSET	"DEUR" (to be confirmed)	4	X	X	X
AT#	Unpredictable Number (9F37)	A unique variable associated with the generation of the ARQC application cryptogram (discriminating element)	BIN		4		X	
AT#	Unstructured remittance	Free-text or code/value provided by the payee to the payer, facilitating reconciliation.	STR		140			X
AT#	Urgency Level	Message urgency level	NUM	- 0 - high - 1 - normal - 2 - low	1		X	
AT#	Value of Alias	Pseudonymous account identifier	STR		2048		X	X
AT#	Waterfall aggregation frequency	Specifies the applicable frequency for aggregated waterfall event notifications	SSET	Refer to ISO Frequency7Code	4	X	X	X
AT#	Waterfall event aggregation indicator	Specifies whether the end user requests aggregated notifications for waterfall event	BOOL	0 - Corresponding setting is not requested 1 - Corresponding setting is requested	1	X	X	X



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#	Data name	Description	Type	Data attributes	Maximum length	New for digital €	Used by internal process	Visible to the end user
AT#	Waterfall indicator	Dedicated indicator defining if the end user opts for waterfall	BOOL	0 - Waterfall is not set 1 - Waterfall is set	1	X	X	X
AT#	Waterfall transaction event indicator	Dedicated indicator specifying whether a notification is triggered when a waterfall process affects the beta digital euro account.	BOOL	0 - Corresponding setting is not requested 1 - Corresponding setting is requested	1	X	X	X