EUROPEAN CENTRAL BANK

EUROSYSTEM

VERSION 2.0

PSP Participation Agreement

Appendix 2.F End-to-End process flows

IMPORTANT NOTICE

This is version 2.0 of the document, initially published on 14 April 2026 and republished with **editorial amendments** on 12 May 2026.

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Document purpose

This document provides the detailed End-to-End (E2E) process flows for the provisioning of Pilot Payment Services by the Pilot PSP. During the Pilot, relaxation steps or omissions may be applied by Pilot PSPs, as indicated by **optional**, provided that the functional requirements set out in **Appendix 2B – Functional Requirements** are respected.

Document structure

This document presents E2E flows concerning the key processes characterising the Pilot User Journeys presented in **Appendix 2.E – User Journeys & Minimum UX Requirements**. Each E2E process flow shows the complete process from the starting point to its end. Whenever a decision point is present in the E2E flow, for sake of completeness both successful and unsuccessful sub-flows are presented (marked respectively in green and black).
End-to-End process flows are structured along the functional domain logic used in the Pilot PSP documentation package; Access Management (AM), Liquidity Management (LM) and Transaction Management (TM). Each flow is introduced and has a unique flow identifier:

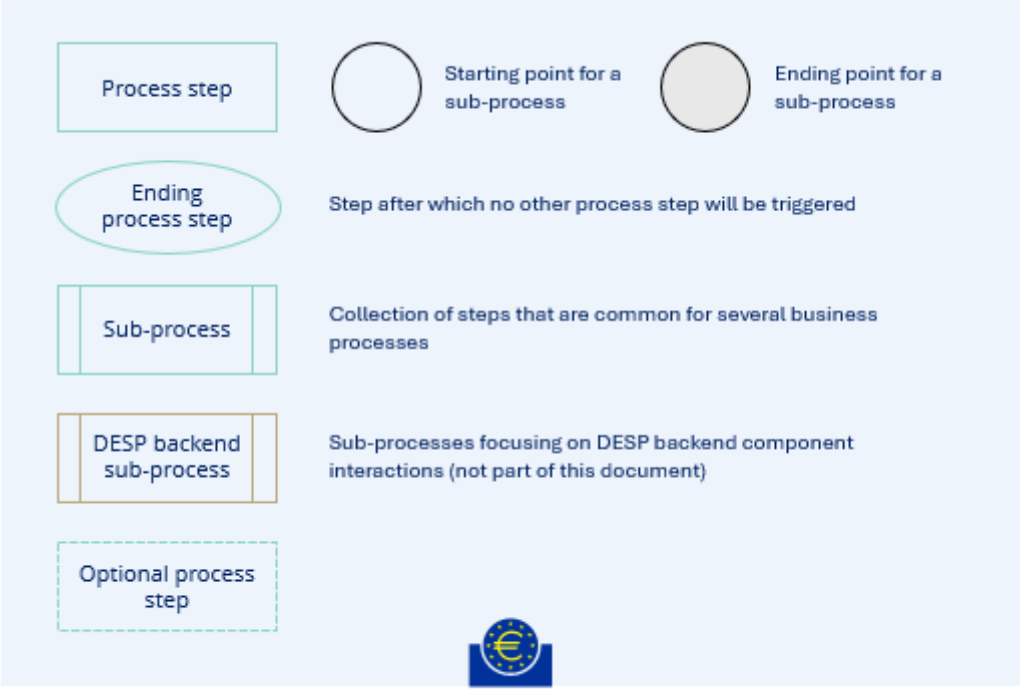
[Functional domain] [domain's category] [flow number]

Domain's category are the following:

AM-1	Onboarding	**TM-1**	POS payments (SoftPOS)
AM-3	Offboarding	**TM-2**	E-commerce/M-commerce payments
AM-4	Profile management	**TM-3**	P2P payments
LM-1	Funding	**TM-7**	Refunds
LM-2	Defunding	**TM-8**	Balance enquiries

Subflows are depicted with a prefix "s" and are listed in **sections 1.4** (Access Management), **section 2.3** (Liquidity Management) and **section 3.6** (Transaction Management).

The visualisation of the flows follows a stakeholder domain logic (e.g. End-User, Pilot PSP and DESP) and depicts the following type of steps:



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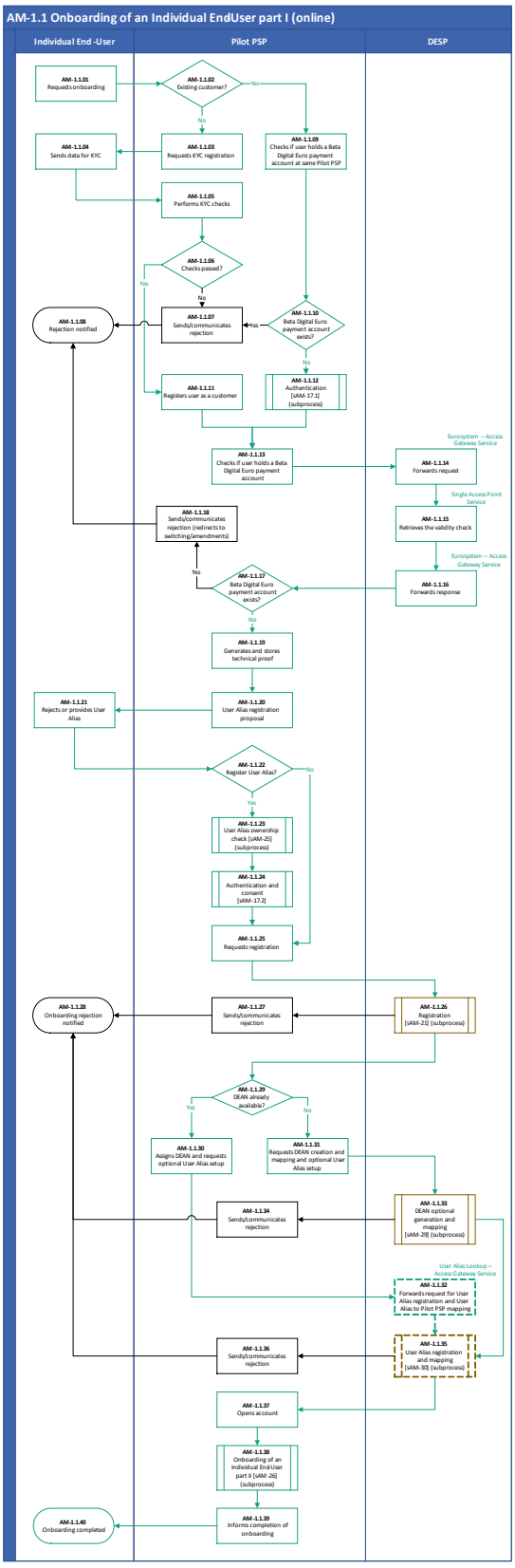
Each flow is thereafter described and details the steps required to complete the E2E process flow.

1. Access management

1.1 Onboarding

1.1.1 Individual End-User onboarding

The steps characterising the onboarding of an Individual End-User (known and unknown to the Pilot PSP) in an online scenario, are presented and depicted in the following flow. The flow has been depicted under the assumption that the Individual End-User is allowed to have a single Beta Digital Euro payment account.



AM-1.1 Onboarding of an Individual End-User part I (online)

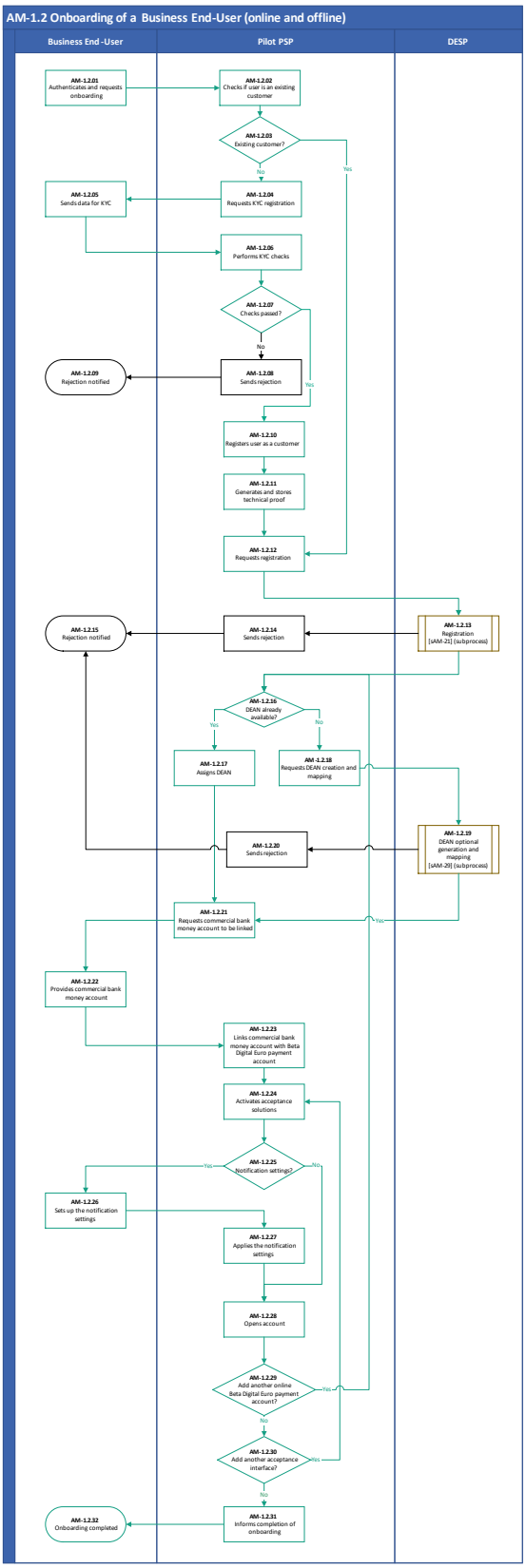
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-1.1.01	**Requests onboarding**	Individual End-User	Pilot PSP	An Individual End-User requests the opening of a Beta Digital Euro payment account via a Pilot PSP. *Note: the Individual End-User can select additional features and services as they like. Alternatively, these options can be added or changed later (see amendment flow **section 1.2.1**).*
AM-1.1.02	**Existing customer?**	Pilot PSP	N/A	If the Individual End-User is already a customer of the Pilot PSP and has passed KYC checks, the Pilot PSP can directly ask the Individual End-User whether they already have a Beta Digital Euro payment account.
AM-1.1.03	**Requests KYC registration**	Pilot PSP	Individual End-User	The Pilot PSP requests the Individual End-User to pass KYC checks. The Pilot PSP could ask if the Individual End-User wishes to switch the account, if so, **[AM-2.1]** is followed.
AM-1.1.04	**Sends data for KYC**	Individual End-User	Pilot PSP	The Individual End-User sends the Pilot PSP the data to pass KYC checks.
AM-1.1.05	**Performs KYC checks**	Pilot PSP	N/A	The Pilot PSP performs KYC checks with the data received.
AM-1.1.06	**Checks passed?**	Pilot PSP	N/A	If the Individual End-User does not pass the KYC checks, the onboarding request is rejected, and the Individual End-User can try again (process starts again **with [AM-1.1.01]**).
AM-1.1.07	**Sends rejection**	Pilot PSP	Individual End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Individual End-User.
AM-1.1.08	**Rejection notified**	Individual End-User	N/A	The Individual End-User is notified of the rejection and the rejection reason.
AM-1.1.09	**Checks if user holds a Beta Digital Euro payment account at same Pilot PSP**	Pilot PSP	N/A	The Pilot PSP checks whether the Individual End-User already holds a Beta Digital Euro payment account with the same Pilot PSP. If that is the case, it will reject the onboarding request. If the Individual End-User does not hold a Beta Digital Euro payment account with the same Pilot PSP, then the process continues.
AM-1.1.10	**Beta Digital Euro payment account exists?**	Pilot PSP	N/A	If the Individual End-User already has a Beta Digital Euro payment account, the Pilot PSP can either ask the Individual End-User if the account should be switched or reject the onboarding request.
AM-1.1.11	**Registers user as a customer**	Pilot PSP	N/A	The Pilot PSP registers the Individual End-User as one of its customers.
AM-1.1.12	**Authentication [sAM-17.1]**	Pilot PSP	N/A	The Pilot PSP initiates the authentication **[sAM-17.1]**.

AM-1.1.13	**Checks if user holds a Beta Digital Euro payment account**	Pilot PSP	DESP	The Pilot PSP checks whether the Individual End-User already holds a Beta Digital Euro payment account with another Pilot PSP by querying the DESP.
AM-1.1.14	**Forwards request**	DESP	N/A	The Eurosystem - Access Gateway Service forwards the validity check retrieval request to the DESP – Single Access Point Service.
AM-1.1.15	**Retrieves the validity check**	DESP	N/A	The DESP – Single Access Point Service performs a check of the repository to determine if the Individual End-User already has an existing Beta Digital Euro payment account operated by another Pilot PSP.
AM-1.1.16	**Forwards response**	DESP	Pilot PSP	The Eurosystem - Access Gateway Service forwards the result of the check to the requesting Pilot PSP.
AM-1.1.17	**Beta Digital Euro payment account exists?**	Pilot PSP	N/A	If the Individual End-User already has a Beta Digital Euro payment account, the Pilot PSP can either ask the Individual End-User if the account should be switched or reject the onboarding request.
AM-1.1.18	**Sends rejection (redirects to switching/ amendments)**	Pilot PSP	Individual End-User	The Pilot PSP rejects the onboarding request and sends a rejection message specifying the error type to the Individual End-User. Eventually, the Pilot PSP asks the Individual End-User whether the account should be switched.
AM-1.1.19	**Generates and stores technical proof**	Pilot PSP	N/A	The Pilot PSP generates and stores the cryptographic proof of ownership of the Individual End-User's balance. The Individual End-User may need this later.
AM-1.1.20	**User Alias registration proposal**	Pilot PSP	Individual End-User	The Pilot PSP proposes the Individual End-User to add an User Alias.
AM-1.1.21	**Rejects or provides User Alias**	Individual End-User	Pilot PSP	The Individual End-User either refuses the proposals or accepts it and provides the User Alias to link to the Pilot PSP.
AM-1.1.22	**Register User Alias?**	Pilot PSP	N/A	If an User Alias needs to be registered, the Pilot PSP will initiate **[sAM-25]**.
AM-1.1.23	**User Alias ownership check [sAM-25]**	Pilot PSP	N/A	The Pilot PSP initiates the User Alias ownership check **[sAM-25]**.
AM-1.1.24	**Authentication and consent [sAM-17.2]**	Pilot PSP	N/A	The Pilot PSP initiates the authentication and consent **[sAM-17.2]**.
AM-1.1.25	**Requests registration**	Pilot PSP	DESP	The Pilot PSP requests the DESP for registration of the Individual End-User. *Step-specific business rules: AM-011-005, AM-021-006*
AM-1.1.26	**Registration [sAM-21]**	DESP	Pilot PSP	The DESP initiates the registration of the Individual End-User **[sAM-21]**.
AM-1.1.27	**Sends rejection**	Pilot PSP	Individual End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Individual End-User.

AM-1.1.28	**Onboarding rejection notified**	Individual End-User	N/A	Individual End-User is informed about the rejection and the reason of the rejection by the Pilot PSP.
AM-1.1.29	**DEAN already available?**	Pilot PSP	N/A	If the Pilot PSP has requested DEANs ~~in bulk~~ at an earlier stage, it can assign a DEAN to the Individual End-User. Otherwise, it needs to request a new DEAN.
AM-1.1.30	**Assigns DEAN and requests optional User Alias setup**	Pilot PSP	DESP	The Pilot PSP assigns a previously requested DEAN to the Individual End-User. In case an User Alias had been previously provided by the Individual End-User, the Pilot PSP requests the DESP to register and map such User Alias.
AM-1.1.31	**Requests DEAN creation and mapping and optional User Alias setup**	Pilot PSP	DESP	If the DEAN has not been requested ~~in bulk~~ at an earlier stage, the Pilot PSP requests the DESP to generate a DEAN and to map it to the Pilot PSP and optionally to register and map the Individual End-User's User Alias.
AM-1.1.32	**Forwards request for User Alias registration and User Alias to PSP mapping**	DESP	N/A	The User Alias Lookup - Access Gateway Service forwards the requests to the User Alias Lookup Service for registering the User Alias provided by the Individual End-User and for adding/updating the mapping to DEAN and Pilot PSP.
AM-1.1.33	**DEAN optional generation and mapping [sAM-29]**	DESP	N/A and/or Pilot PSP	The DESP generates the DEAN (if not generated/assigned before) and records/updates the DEAN to the Pilot PSP **[sAM-29]**.
AM-1.1.34	**Sends rejection**	Pilot PSP	Individual End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Individual End-User.
AM-1.1.35	**User Alias registration and mapping [sAM-30]**	DESP	Pilot PSP	The DESP registers the User Alias and maps it to the Pilot PSP and corresponding DEAN **[sAM-30].**
AM-1.1.36	**Sends/ communicates rejection**	Pilot PSP	N/A	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Individual End-User.
AM-1.1.37	**Opens account**	Pilot PSP	N/A	The Pilot PSP opens a Beta Digital Euro payment account for the Individual End-User.
AM-1.1.38	**Onboarding of an Individual End-User part II [sAM-26]**	Pilot PSP	N/A	The Pilot PSP initiates the onboarding of an Individual End-User part II **[sAM-26].**
AM-1.1.38	**Informs completion of onboarding**	Pilot PSP	Individual End-User	The Pilot PSP informs the Individual End-User that onboarding is completed.
AM-1.1.40	**Onboarding completed**	Individual End-User	N/A	Individual End-User is informed that onboarding is completed successfully, the information also includes DEAN, ~~technical proof~~ and Pilot PSP identifier.

1.1.2 Business End-User onboarding

The steps required for the onboarding of a Business End-User in online and offline scenario (known and unknown to the Pilot PSP) are presented and depicted in the following flow:



AM-1.2 Onboarding of a Business End-User (online and offline)

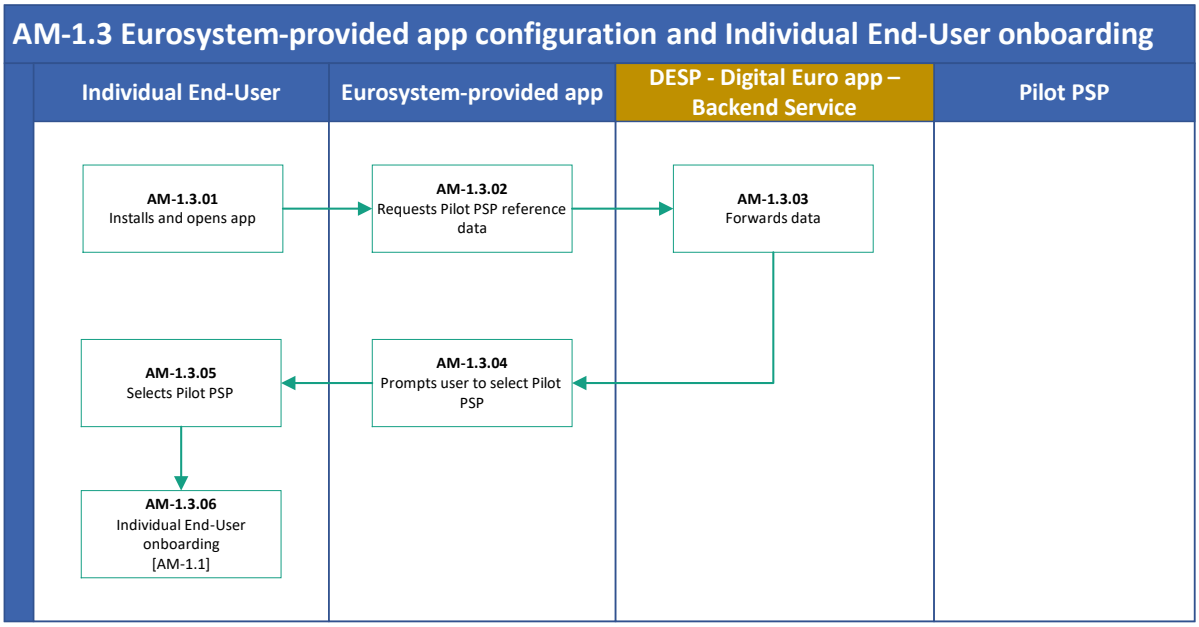
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-1.2.01	**Authenticates and requests onboarding**	Business End-User	Pilot PSP	The Business End-User requests to onboard.
AM-1.2.02	**Checks if user is an existing customer**	Pilot PSP	N/A	The Pilot PSP checks whether the Business End-User is one of its customers.
AM-1.2.03	**Existing customer?**	Pilot PSP	N/A	If the Business End-User is already a customer of the Pilot PSP and has passed KYC checks, the Pilot PSP can proceed with the onboarding.
AM-1.2.04	**Requests KYC registration**	Pilot PSP	Business End-User	The Pilot PSP requests the Business End-User to pass KYC checks.
AM-1.2.05	**Sends data for KYC**	Business End-User	Pilot PSP	The Business End-User sends the Pilot PSP the data to pass KYC checks.
AM-1.2.06	**Performs KYC checks**	Pilot PSP	N/A	The Pilot PSP performs KYC checks with the data received.
AM-1.2.07	**Checks passed?**	Pilot PSP	N/A	If the Business End-User will not pass the KYC checks, the onboarding request is rejected, and the Business End-User can try again (process starts again with authenticates and requests onboarding).
AM-1.2.08	**Sends rejection**	Pilot PSP	Business End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Business End-User.
AM-1.2.09	**Rejection notified**	Business End-User	N/A	The Business End-User is notified of the rejection and the rejection reason.
AM-1.2.10	**Registers End-User as a customer**	Pilot PSP	N/A	The Pilot PSP registers the Business End-User as one of its customers.
AM-1.2.11	**Generates and stores technical proof**	Pilot PSP	N/A	The Pilot PSP generates and stores the cryptographic proof of ownership of the Business End-User's balance.
AM-1.2.12	**Requests registration**	Pilot PSP	DESP	The Pilot PSP requests the DESP for Business End-User registration.
AM-1.2.13	**Registration [sAM-21]**	DESP	Pilot PSP	The DESP initiates the registration of the Business End-User **[sAM-21]**.
AM-1.2.14	**Sends rejection**	Pilot PSP	Business End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type.
AM-1.2.15	**Rejection notified**	Business End-User	N/A	The Business End-User is informed about the rejection and the rejection reason.
AM-1.2.16	**DEAN already available?**	Pilot PSP	N/A	If the Pilot PSP has requested DEANs ~~in bulk~~ at an earlier stage, it can assign a DEAN to the Business End-User. Otherwise, it needs to request a new DEAN.
AM-1.2.17	**Assigns DEAN**	Pilot PSP	N/A	The Pilot PSP assigns a previously requested DEAN to the Business End-User.
AM-1.2.18	**Requests DEAN creation and mapping**	Pilot PSP	DESP	If the DEAN has not been requested ~~in bulk~~ at an earlier stage, the Pilot PSP requests the DESP to generate a DEAN and to map it to the Pilot PSP.
AM-1.2.19	**DEAN optional generation and**	DESP	Pilot PSP	The DESP generates the DEAN (if not generated/assigned before) and

	mapping [sAM-29]			records/updates the DEAN to Pilot PSP mapping **[sAM-29]**.
AM-1.2.20	**Sends rejection**	Pilot PSP	Business End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type.
AM-1.2.21	**Requests commercial bank money account to be linked**	Pilot PSP	Business End-User	The Pilot PSP requests the Business End-User to link their commercial bank money account.
AM-1.2.22	**Provides commercial bank money account**	Business End-User	Pilot PSP	The Business End-User provides their commercial bank money account to be linked with the Beta Digital Euro payment account.
AM-1.2.23	**Links commercial bank money account with Beta Digital Euro payment account**	Pilot PSP	N/A	The Pilot PSP links the commercial bank money account of the Business End-User to the Beta Digital Euro payment account. *Note: every Beta Digital Euro payment account of a Business End-User needs to be linked to a commercial bank money account at any time and (reverse) waterfall option needs to be active at any time as well. Step-specific business rules: LM-032-001*
AM-1.2.24	**Activates acceptance instruments**	Pilot PSP	N/A	The Pilot PSP enables online acceptance instruments for the Business End-User. *Note: this may involve technical setup, integration with Business End-User's IT systems etc. which is not depicted in the flow.*
AM-1.2.25	**Notification settings?**	Pilot PSP	Business End-User and/or N/A	The Pilot PSP checks whether the Business End-User proceeds with setting up the notifications. *Step-specific business rules: AM-022-004, AM-022-005*
AM-1.2.26	**Sets up the notification settings**	Business End-User	Pilot PSP	The Business End-User sets up the notification settings.
AM-1.2.27	**Applies the notification settings**	Pilot PSP	N/A	The Pilot PSP applies the notification settings that Business End-User entered. *Step-specific business rules: AM-022-004, AM-022-005*
AM-1.2.28	**Opens account**	Pilot PSP	N/A	The Pilot PSP opens a Beta Digital Euro payment account for the Business End-User.
AM-1.2.29	**Add another Beta Digital Euro payment account?**	Pilot PSP	N/A	The Pilot PSP determines if the Business End-User wants to add another Beta Digital Euro payment account. If so, **AM-1.2.16** proceeds.
AM-1.2.30	**Add another acceptance interface?**	Pilot PSP	N/A	The Pilot PSP determines if the Business End-User wants to add another acceptance interface. If so, returns to an earlier step.
AM-1.2.31	**Informs completion of onboarding**	Pilot PSP	Business End-User	The Pilot PSP confirms the completion of onboarding to the Business End-User. The confirmation also includes DEAN, technical proof and Pilot PSP identifier.
AM-1.2.32	**Onboarding completed**	Business End-User	N/A	Business End-User is informed about successful onboarding, the information also includes DEAN~~, technical proof~~ and Pilot

				PSP identifier.

1.1.3 Eurosystem-provided app configuration and onboarding of an Individual End-User

The steps characterising the configuration of the Eurosystem-provided app followed by the onboarding of an Individual End-User (known and unknown to the Pilot PSP) in online scenario, are presented and depicted in the following flow.



AM-1.3 Eurosystem-provided app configuration and onboarding of an Individual End-User

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-1.3.01	**Installs and opens app**	Individual End-User	Eurosystem-provided app	The Individual End-User downloads the Eurosystem-provided app from the App store (not displayed), and opens the app.
AM-1.3.02	**Requests Pilot PSP reference data**	Eurosystem-provided app	DESP - Eurosystem-provided app Backend Service	The Eurosystem-provided app requests the Pilot PSP reference data by the Eurosystem-provided app Backend Service.
AM-1.3.03	**Forwards data**	DESP - Eurosystem-provided app Backend Service	Eurosystem-provided app	The Eurosystem-provided app Backend Service forwards the data cached internally to the app.
AM-1.3.04	**Prompts Individual End-User to select Pilot PSP**	Eurosystem-provided app	Individual End-User	The Eurosystem-provided app prompts the Individual End-User to select a Pilot PSP.
AM-1.3.05	**Selects Pilot PSP**	Individual End-User	N/A	The Individual End-User selects a Pilot PSP.
AM-1.3.06	**Individual End-User onboarding [AM-1.1]**	Individual End-User	N/A	The flow continues with process **AM-1.1** where the Eurosystem-provided app will be connecting the Individual

				End-User with the selected Pilot PSP.

~~1.1.4 Bulk DEAN request~~

~~AM-1.4 Bulk DEAN request~~

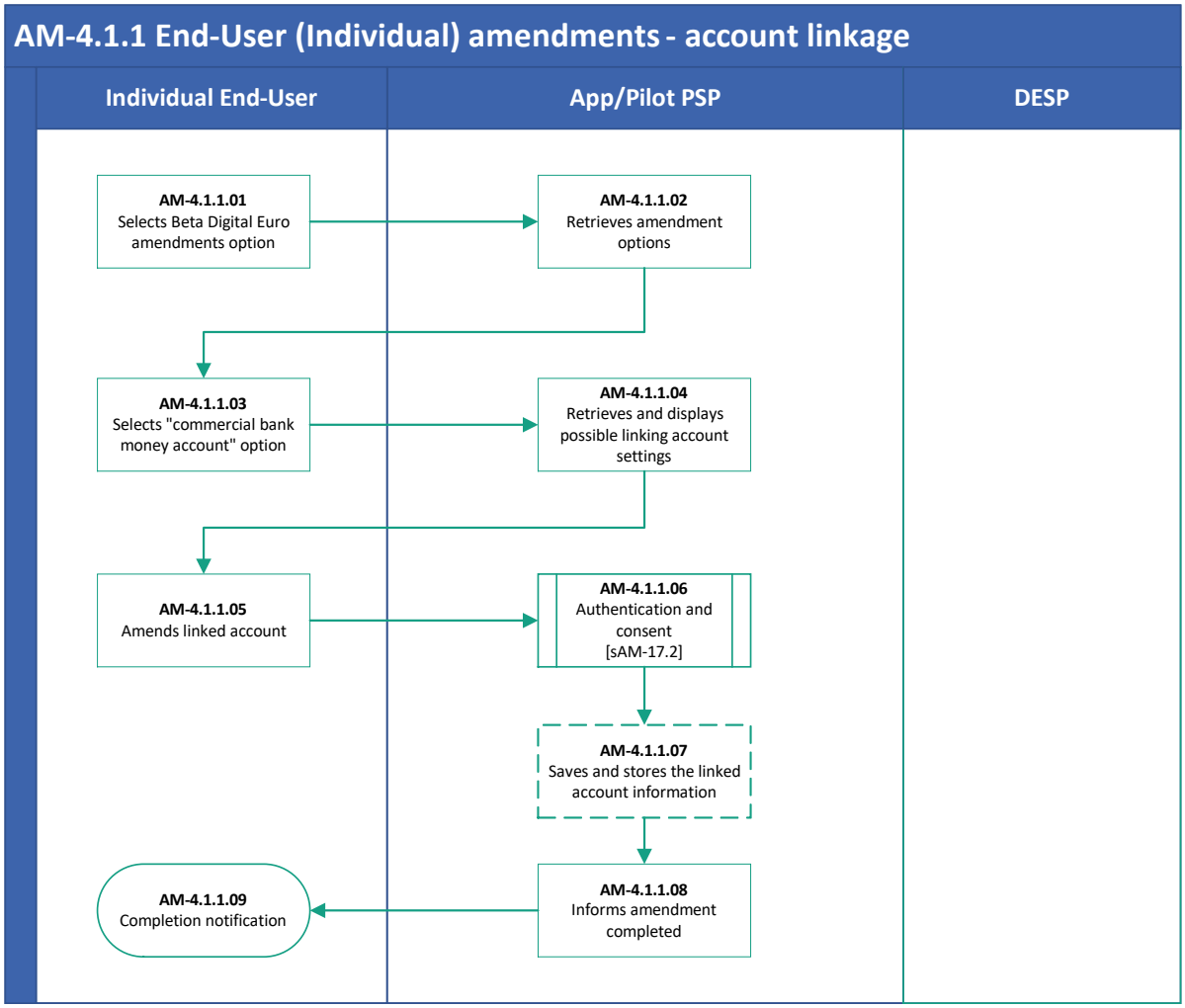
~~#Step~~	~~Step name~~	~~Initiating actor(s)~~	~~Receiving actor(s)~~	~~Definition~~
~~AM-1.4.01~~	~~Requests bulk DEAN creation and mapping~~	~~Pilot PSP~~	~~DESP~~	~~The Pilot PSP requests the DESP for the creation of the specified number of DEANs and for the mapping of each DEAN to the Pilot PSP.~~
~~AM-1.4.02~~	~~Bulk DEAN creation [sAM-28]~~	~~DESP~~	~~Pilot PSP~~	~~The DESP creates the requested DEANs and records the mapping to the Pilot PSP [sAM-28].~~
~~AM-1.4.03~~	~~Receives rejection~~	~~Pilot PSP~~	~~N/A~~	~~The Pilot PSP receives the rejection from the DESP and may try the request again.~~
~~AM-1.4.04~~	~~Receives and stores DEANs~~	~~Pilot PSP~~	~~N/A~~	~~The Pilot PSP receives the DEANs requested from the DESP and stores these for future use.~~

1.2 Lifecycle management processes

Individual End-Users will be able to view and update their personal data related to their Beta Digital Euro payment account (such as adding/editing an User Alias registration and/or a linked account) via the Eurosystem-provided app or the proprietary Pilot PSP app. Moreover, Individual End-Users will be able to edit the liquidity management settings and customise the notifications related to their Beta Digital Euro payment account. These different amendments are presented and depicted in the following E2E process flows.

1.2.1 Profile management/amendments – Individual End-User

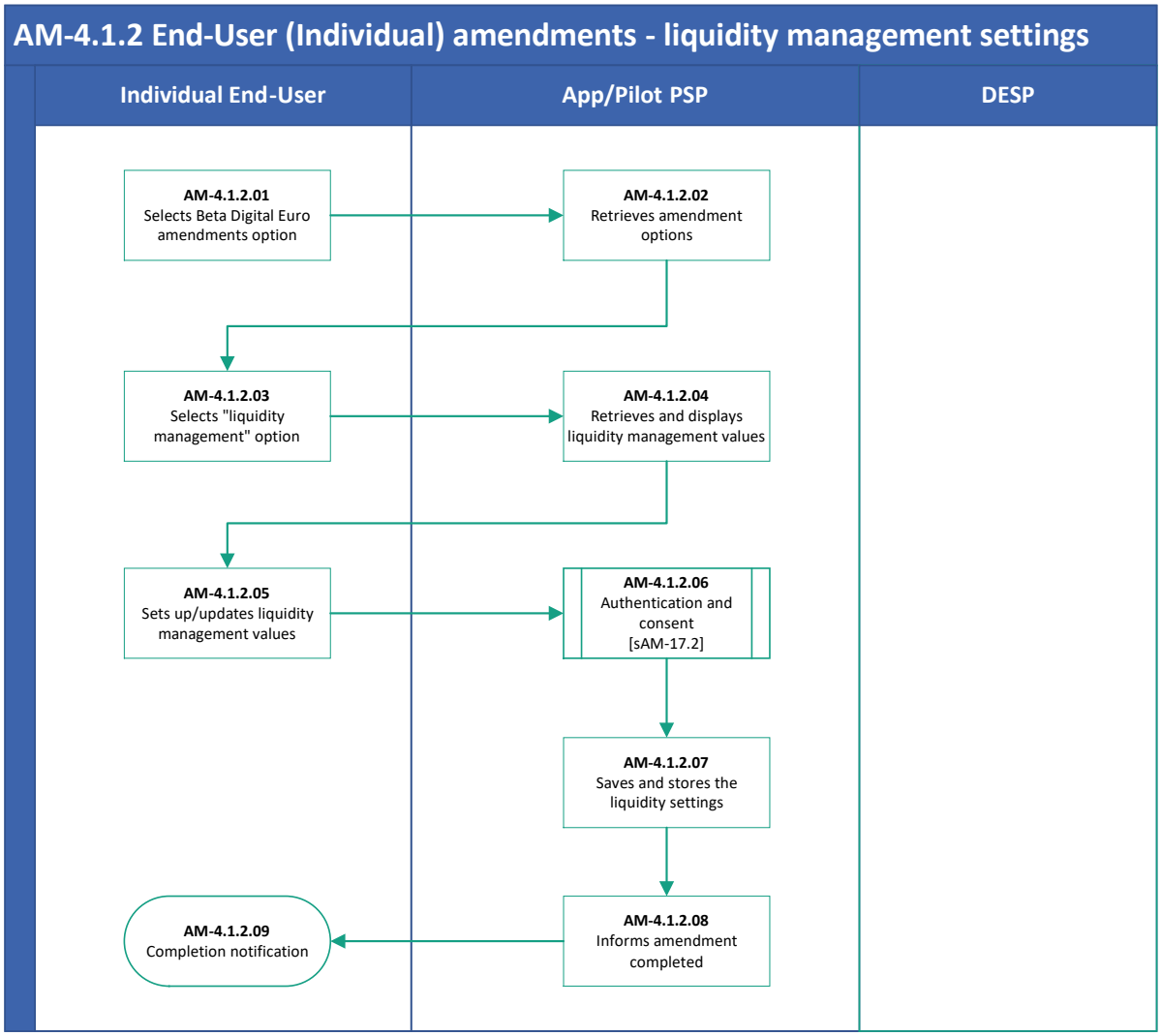
The steps characterising the lifecycle management of an Individual End-User's Beta Digital Euro payment account are presented and depicted in the following flows. The flows have been depicted under the assumption that the Individual End-User is allowed to have a single Beta Digital Euro payment account.



AM-4.1.1 Individual End-User amendments (account linkage)

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-4.1.1.01	**Selects Beta Digital Euro amendments option**	Individual End-User	App/Pilot PSP	Individual End-User selects the Beta Digital Euro amendment options through the App/Pilot PSP. *Note: Individual End-User should authenticate prior to this step.*
AM-4.1.1.02	**Retrieves amendment options**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the amendment options for the Individual End-User.
AM-4.1.1.03	**Selects "linked commercial bank money account" option**	Individual End-User	App/Pilot PSP	Individual End-User selects the specific amendment option "linked commercial bank money account" through the App/Pilot PSP.
AM-4.1.1.04	**Retrieves and displays possible linking account settings**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the possible linking settings (add/remove/update) for the Beta Digital Euro payment account and displays them to the Individual End-User.

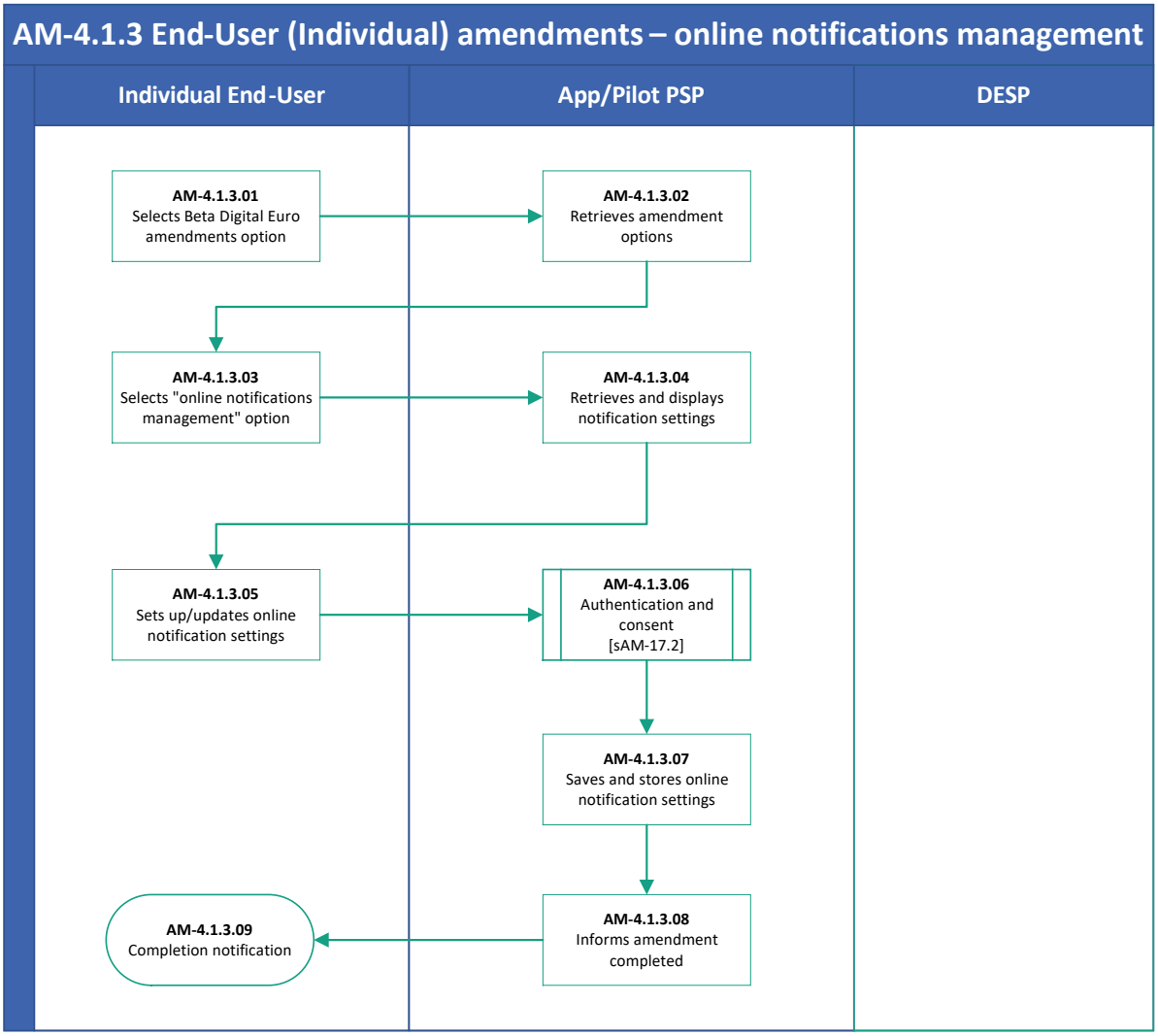
AM-4.1.1.05	**Amends linked account**	Individual End-User	App/Pilot PSP	The Individual End-User adds/updates/removes linked commercial bank money account through the App/Pilot PSP.
AM-4.1.1.06	**Authentication and consent [sAM-17.2]**	App/Pilot PSP	N/A	The App/Pilot PSP initiates the authentication and consent **[sAM-17.2].**
AM-4.1.1.07	**Saves and stores the linked account information**	App/Pilot PSP	N/A	**Optional** - (not valid in case of removal) In case the linked commercial bank money account is added or updated, the App/Pilot PSP saves and stores the linked commercial bank money account information provided by the Individual End-User. *Step-specific business rules: AM-020-001, AM-021-014, AM-021-015*
AM-4.1.1.08	**Informs amendment completed**	App/Pilot PSP	Individual End-User	The App/Pilot PSP informs the Individual End-User that the specific amendment has been completed.
AM-4.1.1.09	**Completion notification**	Individual End-User	N/A	Individual End-User is notified about the amendment completion.



AM-4.1.2 Individual End-User amendments (liquidity management settings)

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-4.1.2.01	**Selects Beta Digital Euro amendments option**	Individual End-User	App/Pilot PSP	Individual End-User selects the Beta Digital Euro amendment options through the App/Pilot PSP. *Note: Individual End-User should authenticate prior to this step.*
AM-4.1.2.02	**Retrieves amendment options**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the amendment options for the Individual End-User.
AM-4.1.2.03	**Selects "liquidity management" option**	Individual End-User	App/Pilot PSP	Individual End-User selects the specific amendment option "liquidity management" through the App/Pilot PSP.
AM-4.1.2.04	**Retrieves and displays liquidity**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the current liquidity management values and displays them to the

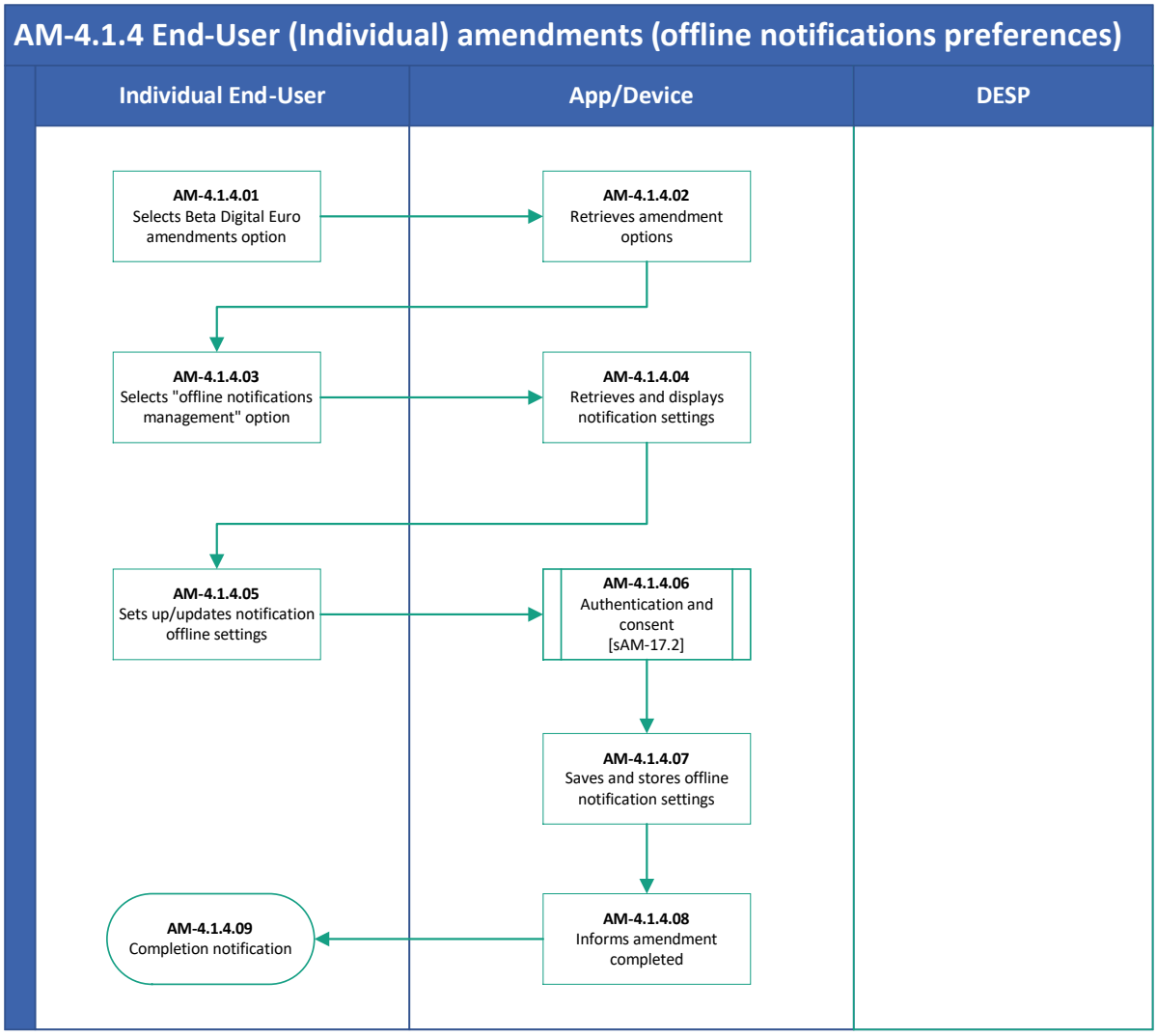
	management values			Individual End-User.
AM-4.1.2.05	**Sets up/updates liquidity management values**	Individual End-User	App/Pilot PSP	The Individual End-User sets up or updates the liquidity management values.
AM-4.1.2.06	**Authentication and consent [sAM-17.2]**	App/Pilot PSP	N/A	The App/Pilot PSP initiates the authentication and consent **[sAM-17.2]**.
AM-4.1.2.07	**Saves and stores the liquidity settings**	App/Pilot PSP	N/A	The App/Pilot PSP saves and stores the entered or updated liquidity management values. *Step-specific business rules: LM-021-006, LM-031-001, LM-031-002, LM-041-002, LM-041-004, LM-051-001*
AM-4.1.2.08	**Informs amendment completed**	App/Pilot PSP	Individual End-User	The App/Pilot PSP informs the Individual End-User that the specific amendment has been completed.
AM-4.1.2.09	**Completion notification**	Individual End-User	N/A	Individual End-User is notified about the amendment completion.



AM-4.1.3 Individual End-User amendments (online notification preferences)

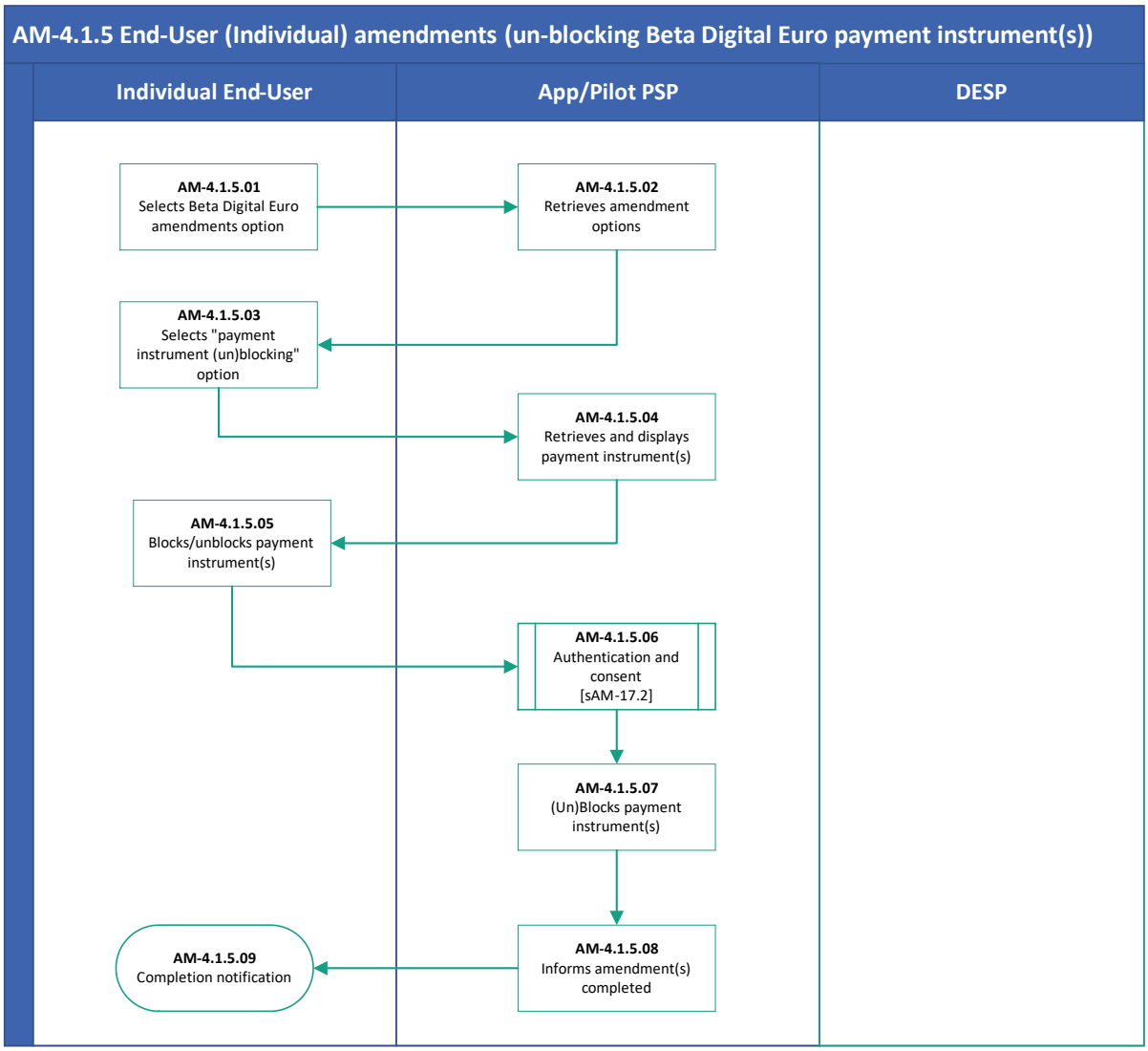
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-4.1.3.01	**Selects Beta Digital Euro amendments option**	Individual End-User	App/Pilot PSP	Individual End-User selects the Beta Digital Euro amendment options through the App/Pilot PSP. *Note: Individual End-User should authenticate prior to this step.*
AM-4.1.3.02	**Retrieves amendment options**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the amendment options for the Individual End-User.
AM-4.1.3.03	**Selects "online notifications management" option**	Individual End-User	App/Pilot PSP	Individual End-User selects the specific amendment option "online notifications management" through the App/Pilot PSP.
AM-4.1.3.04	**Retrieves and displays**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the current notification settings for the Beta Digital

	notification settings			Euro payment account and displays them to the Individual End-User.
AM-4.1.3.05	**Sets up/updates online notification settings**	Individual End-User	App/Pilot PSP	The Individual End-User sets up or updates the online notification settings.
AM-4.1.3.06	**Authentication and consent [sAM-17.2]**	App/Pilot PSP	N/A	The App/Pilot PSP initiates the authentication and consent **[sAM-17.2]**.
AM-4.1.3.07	**Saves and stores online notification settings**	App/Pilot PSP	N/A	The App/Pilot PSP saves and stores the entered or updated online notification settings. *Step-specific business rules: AM-021-011, AM-021-012, AM-021-013*
AM-4.1.3.08	**Informs amendment completed**	App/Pilot PSP	Individual End-User	The App/Pilot PSP informs the Individual End-User that the specific amendment has been completed.
AM-4.1.3.09	**Completion notification**	Individual End-User	N/A	Individual End-User is notified about the amendment completion.



AM-4.1.4 Individual End-User amendments (offline notification preferences)

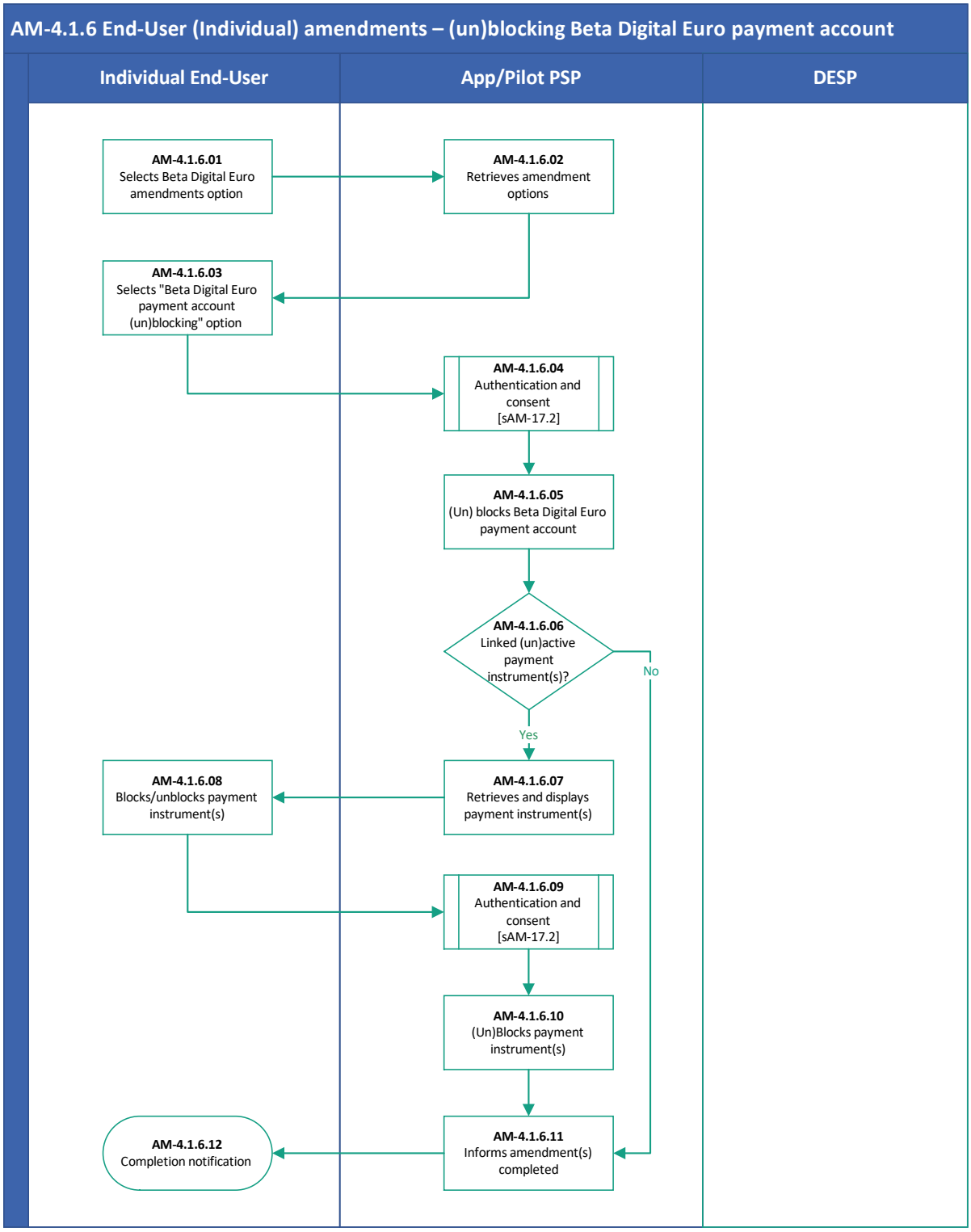
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-4.1.4.01	**Selects Beta Digital Euro amendments option**	Individual End-User	App/Device	Individual End-User selects the Beta Digital Euro amendment options through the app/device. *Note: Individual End-User should authenticate prior to this step.*
AM-4.1.4.02	**Retrieves amendment options**	App/Device	Individual End-User	The app/device retrieves the amendment options for the Individual End-User.
AM-4.1.4.03	**Selects "offline notifications management" option**	Individual End-User	App/Device	Individual End-User selects the specific amendment option "offline notifications management" through the Pilot PSP.
AM-4.1.4.04	**Retrieves and displays notification settings**	App/Device	Individual End-User	The app/device retrieves the current notification settings for the offline device and displays them to the Individual End-User.
AM-4.1.4.05	**Sets up/updates notification offline settings**	Individual End-User	App/Device	The Individual End-User sets up or updates the offline notification settings.
AM-4.1.4.06	**Authentication and consent [sAM-17.2]**	App/Device	N/A	The app/device initiates the authentication and consent **[sAM-17.2]**.
AM-4.1.4.07	**Saves and stores offline notification settings**	App/Device	N/A	The app/device saves and stores the entered or updated offline notification settings. *Step-specific business rules: AM-021-011, AM-021-012, AM-021-013*
AM-4.1.4.08	**Informs amendment completed**	App/Device	Individual End-User	The app/device informs the Individual End-User that the specific amendment has been completed.
AM-4.1.4.09	**Completion notification**	Individual End-User	N/A	Individual End-User is notified about the amendment completion.



AM-4.1.5 Individual End-User amendments (un-blocking Beta Digital Euro payment instrument(s))

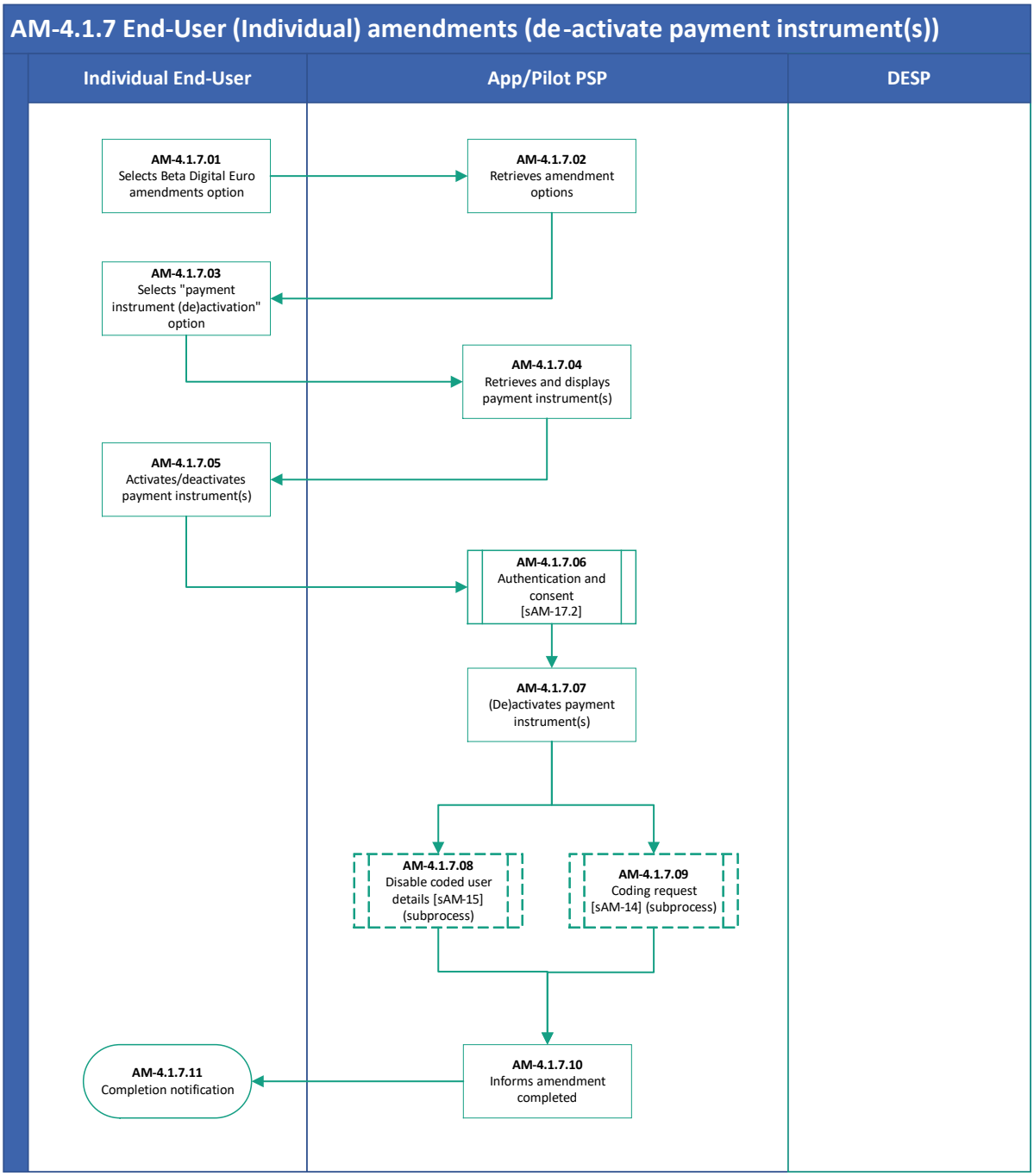
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-4.1.5.01	**Selects Beta Digital Euro amendments option**	Individual End-User	App/Pilot PSP	Individual End-User selects the Beta Digital Euro amendment options through App/Pilot PSP. *Note: Individual End-User should authenticate prior to this step.*
AM-4.1.5.02	**Retrieves amendment options**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the amendment options for the Individual End-User.
AM-4.1.5.03	**Selects "payment instrument (un)blocking" option**	Individual End-User	App/Pilot PSP	Individual End-User selects the specific amendment option "payment instrument (un)blocking" through the App/Pilot PSP.

AM-4.1.5.04	**Retrieves and displays payment instrument(s)**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the list of online and/or offline payment instrument(s) and their status and displays it to the Individual End-User.
AM-4.1.5.05	**Blocks/unblocks payment instrument(s)**	Individual End-User	App/Pilot PSP	Individual End-User blocks or unblocks the desired payment instrument(s).
AM-4.1.5.06	**Authentication and consent [sAM-17.2]**	App/Pilot PSP	N/A	The App/Pilot PSP initiates the authentication and consent **[sAM-17.2].**
AM-4.1.5.07	**(Un)Blocks payment instrument(s)**	App/Pilot PSP	N/A	The App/Pilot PSP (un)blocks the payment instrument(s). *Note: For offline payment instruments, the change becomes effective as soon as the device goes online.* *Note: This may be done by the Pilot PSP without asking the Individual End-User to consent.*
AM-4.1.5.08	**Informs amendment(s) completed**	App/Pilot PSP	Individual End-User	The App/Pilot PSP informs the Individual End-User that the specific amendment(s) have been completed.
AM-4.1.5.09	**Completion notification**	Individual End-User	N/A	Individual End-User is notified about the amendment(s) completion.



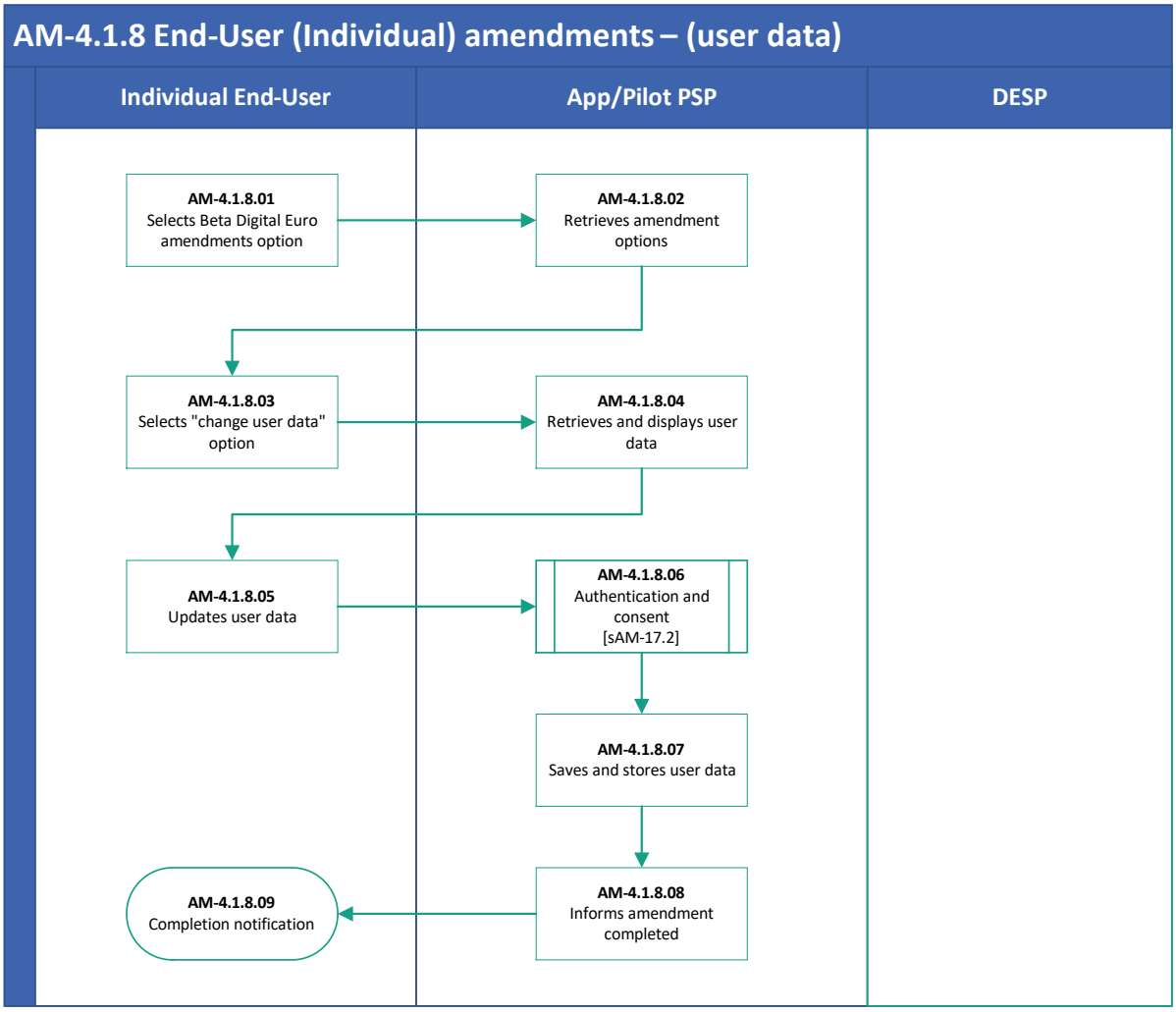
AM-4.1.6 Individual End-User amendments (un-blocking Beta Digital Euro payment account)

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-4.1.6.01	**Selects Beta Digital Euro amendments option**	Individual End-User	App/Pilot PSP	Individual End-User selects the Beta Digital Euro amendment options through the App/Pilot PSP. *Note: Individual End-User should authenticate prior to this step.*
AM-4.1.6.02	**Retrieves amendment options**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the amendment options for the Individual End-User.
AM-4.1.6.03	**Selects "Beta Digital Euro payment account (un)blocking" option**	Individual End-User	App/Pilot PSP	Individual End-User selects the specific amendment option "Beta Digital Euro payment account (un)blocking" through the App/Pilot PSP.
AM-4.1.6.04	**Authentication and consent [sAM-17.2]**	App/Pilot PSP	N/A	The App/Pilot PSP initiates the authentication and consent **[sAM-17.2]**.
AM-4.1.6.05	**(Un)blocks Beta Digital Euro payment account**	App/Pilot PSP	N/A	The App/Pilot PSP (un)blocks the Beta Digital Euro payment account.
AM-4.1.6.06	**Linked (un)active payment instrument(s)?**	App/Pilot PSP	N/A	Following an (un)blocking of a Beta Digital Euro payment account, in case the linked payment instrument(s) are (un)active, these would need to be (un)blocked as well.
AM-4.1.6.07	**Retrieves and displays payment instrument(s)**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the list of online payment instrument(s) and their status and displays it to the Individual End-User.
AM-4.1.6.08	**Blocks/unblocks payment instrument(s)**	Individual End-User	App/Pilot PSP	Individual End-User blocks or unblocks the desired payment instrument(s).
AM-4.1.6.09	**Authentication and consent [sAM-17.2]**	App/Pilot PSP	N/A	The App/Pilot PSP initiates the authentication and consent **[sAM-17.2]**.
AM-4.1.6.10	**(Un)Blocks payment instrument(s)**	App/Pilot PSP	N/A	The App/Pilot PSP (un)blocks the online payment instrument(s).
AM-4.1.6.11	**Informs amendment(s) completed**	App/Pilot PSP	Individual End-User	The App/Pilot PSP informs the Individual End-User that the specific amendment(s) have been completed.
AM-4.1.6.12	**Completion notification**	Individual End-User	N/A	Individual End-User is notified about the amendment(s) completion.



AM-4.1.7 Individual End-User amendments (de-activate payment instrument(s))

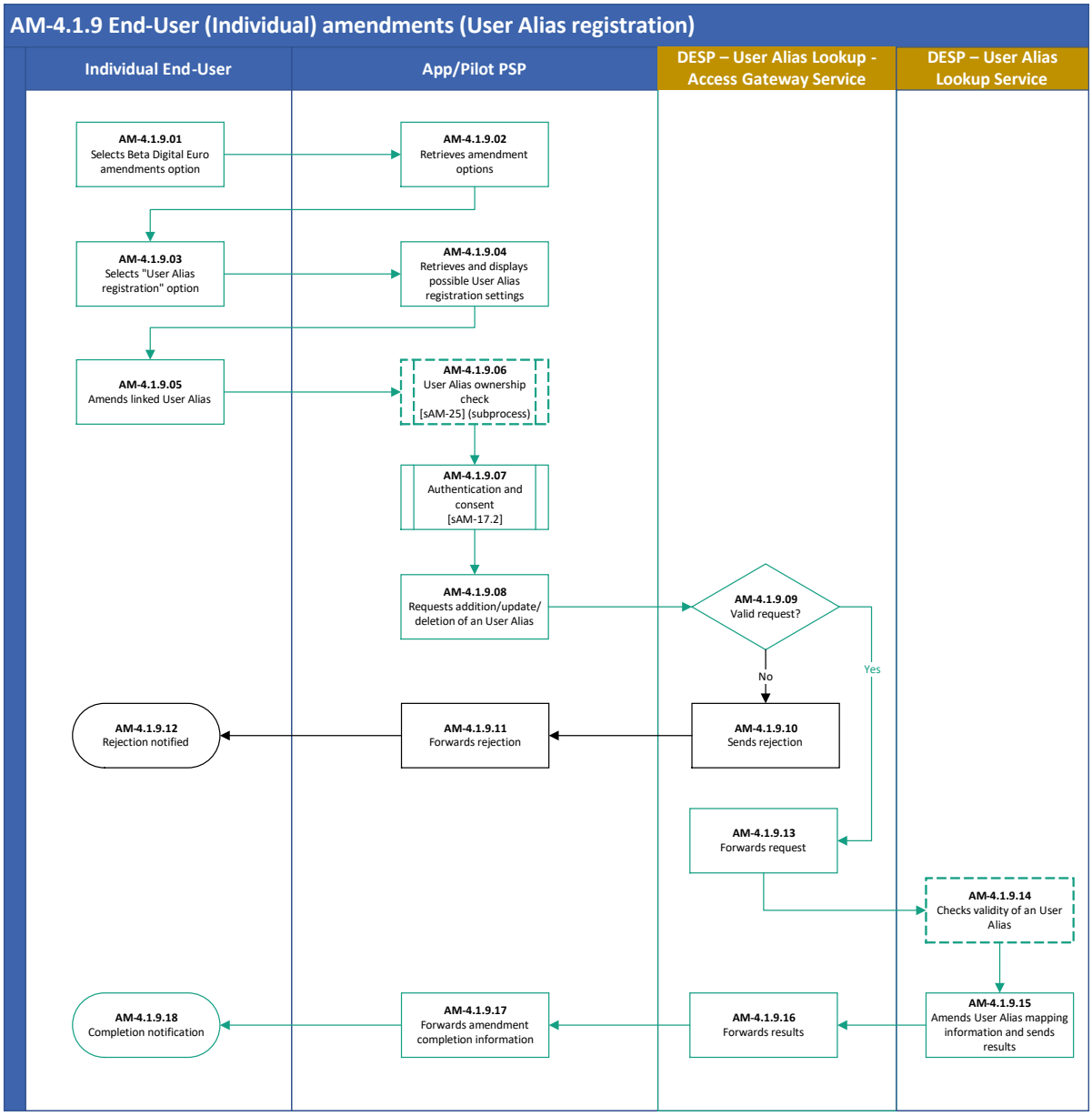
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-4.1.7.01	**Selects Beta Digital Euro amendments option**	Individual End-User	App/Pilot PSP	Individual End-User selects the Beta Digital Euro amendment options through App/Pilot PSP. *Note: Individual End-User should authenticate prior to this step.*
AM-4.1.7.02	**Retrieves amendment options**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the amendment options for the Individual End-User.
AM-4.1.7.03	**Selects "payment instrument (de)activation" option**	Individual End-User	App/Pilot PSP	Individual End-User selects the specific amendment option "payment instrument (de)activation" through the App/Pilot PSP.
AM-4.1.7.04	**Retrieves and displays payment instrument(s)**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the list of online and/or offline payment instrument(s) and their status and displays it to the Individual End-User.
AM-4.1.7.05	**Activates/deactivates payment instrument(s)**	Individual End-User	App/Pilot PSP	Individual End-User activates or deactivates the desired payment instrument(s).
AM-4.1.7.06	**Authentication and confirmation [sAM-17.2]**	App/Pilot PSP	N/A	The App/Pilot PSP initiates the authentication and confirmation **[sAM-17.2]**.
AM-4.1.7.07	**(De)activates payment instrument(s)**	App/Pilot PSP	N/A	The App/Pilot PSP disables/enables the payment instrument(s) for the Individual End-User. *Note: This might include requesting a coded user details (if not already done during onboarding) or disabling an existing one. This will be either **subprocess sAM-14 or subprocess sAM-15**, depending on what is required.* *Note: For offline, the deactivation will be effective as soon as the device goes online however the holding limit allocation to the offline device will be immediately released.*
AM-4.1.7.08	**Disable coded user details [sAM-15]**	App/Pilot PSP	N/A	**Optional** - The subprocess of disable coded user details **[sAM-15].**
AM-4.1.7.09	**Coding request [sAM-14]**	App/Pilot PSP	N/A	**Optional** - The subprocess of coding request **[sAM-14].**
AM-4.1.7.10	**Informs amendment completed**	App/Pilot PSP	Individual End-User	The App/Pilot PSP informs the Individual End-User that the specific amendment has been completed.
AM-4.1.7.11	**Completion notification**	Individual End-User	N/A	Individual End-User is notified about the amendment completion.



AM-4.1.8 Individual End-User amendments (Individual End-User data)

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-4.1.8.01	**Selects Beta Digital Euro amendments option**	Individual End-User	App/Pilot PSP	Individual End-User selects the Beta Digital Euro amendment options through the App/Pilot PSP. *Note: Individual End-User should authenticate prior to this step.*
AM-4.1.8.02	**Retrieves amendment options**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the amendment options for the Individual End-User.
AM-4.1.8.03	**Selects "change user data" option**	Individual End-User	App/Pilot PSP	Individual End-User selects the specific amendment option "change user data" through the App/Pilot PSP.
AM-4.1.8.04	**Retrieves and displays user data**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves and displays the data to the Individual End-User.

AM-4.1.8.05	**Updates user data**	Individual End-User	App/Pilot PSP	The Individual End-User submits the updated data.
AM-4.1.8.06	**Authentication and confirmation [sAM-17.2]**	App/Pilot PSP	N/A	The App/Pilot PSP initiates the authentication and confirmation **[sAM-17.2]**.
AM-4.1.8.07	**Saves and stores user data**	App/Pilot PSP	N/A	The App/Pilot PSP saves and stores the updated user data.
AM-4.1.8.08	**Informs amendment completed**	App/Pilot PSP	Individual End-User	The App/Pilot PSP informs the Individual End-User that the specific amendment has been completed.
AM-4.1.8.09	**Completion notification**	Individual End-User	N/A	Individual End-User is notified about the amendment completion.



#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-4.1.9.01	**Selects Beta Digital Euro amendments option**	Individual End-User	App/Pilot PSP	Individual End-User selects the Beta Digital Euro amendment options through App/Pilot PSP. *Note: Individual End-User should authenticate prior to this step.*
AM-4.1.9.02	**Retrieves amendment options**	App/Pilot PSP	Individual End-User	The App/Pilot PSP retrieves the amendment options for the Individual End-User.
AM-4.1.9.03	**Selects "User Alias registration" option**	Individual End-User	App/Pilot PSP	Individual End-User selects the specific amendment option "User Alias registration" through the App/Pilot PSP.
AM-4.1.9.04	**Retrieves and displays possible User Alias registration settings**	App/Pilot PSP	Individual End-User	The App/PSP retrieves the User Alias registration options for the Individual End-User. *Step-specific business rules: AM-021-002, AM-021-003, AM-021-004*
AM-4.1.9.05	**Amends linked User Alias**	Individual End-User	App/Pilot PSP	The Individual End-User adds/updates/removes the linked User Alias through the App/Pilot PSP.
AM-4.1.9.06	**User Alias ownership check [sAM-25]**	App/Pilot PSP	N/A	**Optional** - (not required for deletion of an User Alias): The Pilot PSP initiates the User Alias ownership check. **[sAM-25].** *Step-specific business rules: AM-021-007, AM-021-009*
AM-4.1.9.07	**Authentication and consent [sAM-17.2]**	App/Pilot PSP	N/A	The App/Pilot PSP initiates the authentication and consent **[sAM-17.2].** *Step-specific business rules: AM-021-005*
AM-4.1.9.08	**Requests addition/update/ deletion of an User Alias**	App/Pilot PSP	DESP - User Alias Lookup - Access Gateway Service	The App/Pilot PSP requests the User Alias Lookup - Access Gateway Service for addition, update, or deletion of an User Alias. *Step-specific business rules: AM-021-006, AM-021-008, AM-021-009*
AM-4.1.9.09	**Valid request?**	DESP - User Alias Lookup - Gateway Service	N/A	If the request is invalid the User Alias Lookup - Access Gateway Service rejects the request. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
AM-4.1.9.10	**Sends rejection**	DESP - User Alias Lookup - Access Gateway Service	App/Pilot PSP	The User Alias Lookup - Access Gateway Service rejects the request and sends a rejection message specifying the error type to the App/Pilot PSP.

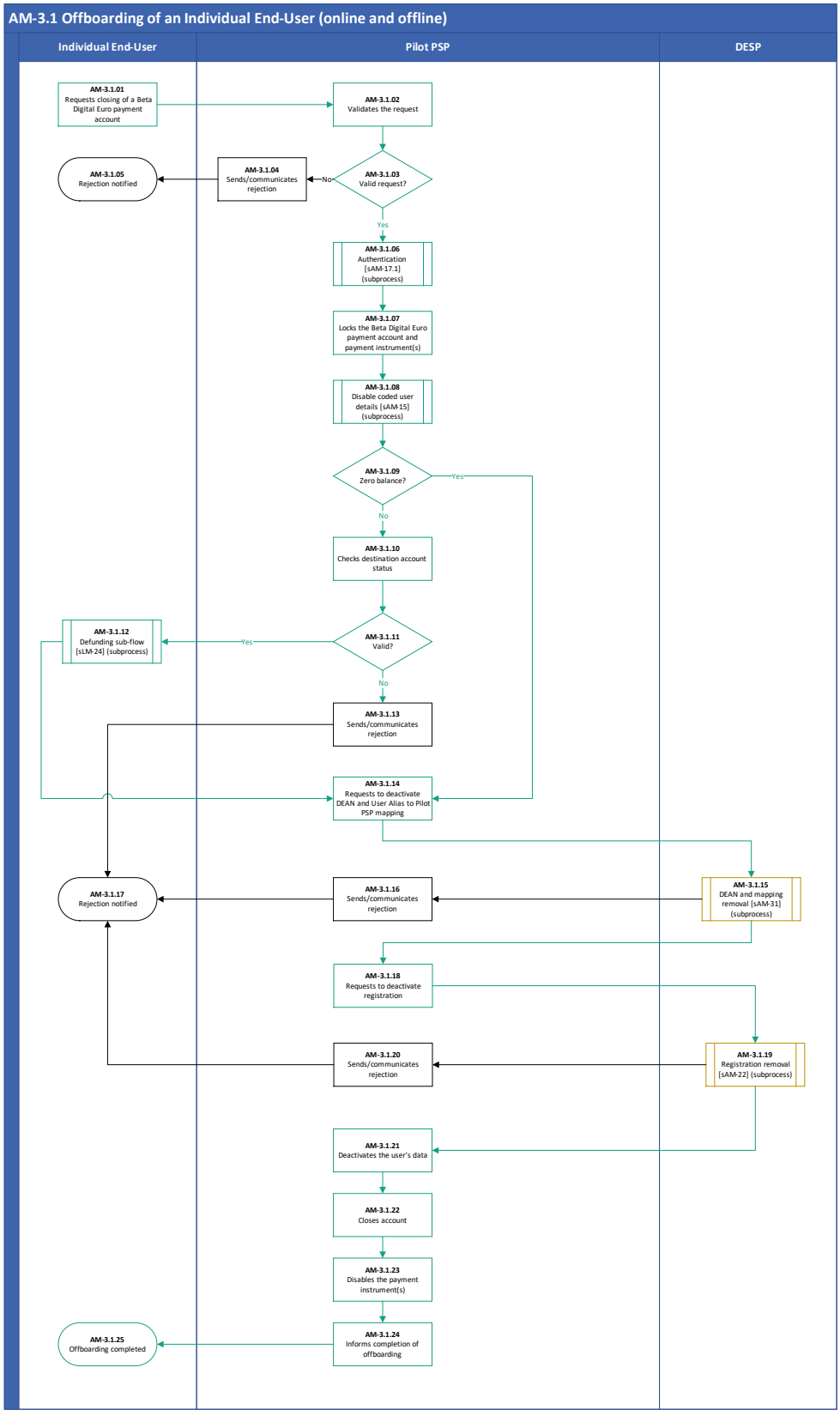
AM-4.1.9.11	**Forwards rejection**	App/Pilot PSP	Individual End-User	The App/Pilot PSP receives the rejection and sends the rejection and the rejection reason to the Individual End-User.
AM-4.1.9.12	**Rejection notified**	Individual End-User	N/A	The Individual End-User is notified of the rejection and the rejection reason.
AM-4.1.9.13	**Forwards request**	DESP - User Alias Lookup – Access Gateway Service	DESP - User Alias Lookup Service	The User Alias Lookup - Access Gateway Service forwards the request for addition, update, or deletion of an User Alias to the User Alias Lookup Service.
AM-4.1.9.14	**Checks validity of an User Alias**	DESP - User Alias Lookup Service	N/A	**Optional** - The User Alias Lookup Service checks that an User Alias submitted by the Pilot PSP is unique or an empty value (association of Beta Digital Euro payment account with an User Alias is optional). Checking validity of the User Alias is not required for User Alias deletion.
AM-4.1.9.15	**Amends User Alias mapping information and sends results**	DESP - User Alias Lookup Service	DESP - User Alias Lookup – Access Gateway Service	The User Alias Lookup Service adds/updates/deactivates User Alias to PSP mapping.
AM-4.1.9.16	**Forwards results**	DESP - User Alias Lookup – Access Gateway Service	App/Pilot PSP	The User Alias Lookup - Access Gateway Service forwards the results to the App/Pilot PSP.
AM-4.1.9.17	**Forwards amendment completion information**	App/Pilot PSP	Individual End-User	The App/Pilot PSP forwards the amendment completion information to the Individual End-User.
AM-4.1.9.18	**Completion notification**	Individual End-User	N/A	Individual End-User is notified about the amendment completion.

1.3 Offboarding

The offboarding process, enabling End-Users to stop using Pilot Payment Services at any point in time, is coordinated by the Pilot PSP.

1.3.1 Individual End-User offboarding

The following flow presents and depicts the offboarding journey for an Individual End-User in online and offline scenario (*known to the Pilot PSP)* who wants to close a DEAN. The flow has been depicted under the assumption that the Individual End-User is allowed to have a single DEAN.



AM-3.1 Offboarding of an Individual End-User (online and offline)

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-3.1.01	**Requests closing of a Beta Digital Euro payment account**	Individual End-User	Pilot PSP	Individual End-User requests to offboard. *Note: this step is optional. It is not applicable if the Pilot PSP initiates the offboarding.* *Step-specific business rules: AM-040-001*
AM-3.1.02	**Validates the request**	Pilot PSP	N/A	The Pilot PSP validates the request (i.e., if the account is locked, offboarding request is rejected). *Note: this step is optional. It is not applicable if the Pilot PSP initiates the offboarding.* *Step-specific business rules: AM-040-001*
AM-3.1.03	**Valid request?**	Pilot PSP	N/A	If the request is invalid the Pilot PSP rejects the request. *Note: this step is optional. It is not applicable if the Pilot PSP initiates the offboarding.* *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.* *Step-specific business rules: AM-040-001*
AM-3.1.04	**Sends/communicates rejection**	Pilot PSP	Individual End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Individual End-User.
AM-3.1.05	**Rejection notified**	Individual End-User	N/A	The Individual End-User is notified of the rejection and the rejection reason.
AM-3.1.06	**Authentication [sAM-17.1]**	Pilot PSP	N/A	**Optional** - The Pilot PSP initiates the authentication **[sAM-17.1]**. *Note: not applicable if the Pilot PSP initiates the offboarding.*
AM-3.1.07	**Locks the Beta Digital Euro payment account and payment instrument(s)**	Pilot PSP	N/A	The Pilot PSP of the Individual End-User locks the Beta Digital Euro payment account and the payment instrument(s) and potential coded account details where applicable to prevent further and ongoing transactions. *Note: Details of offline payment instrument(s) are to be defined. The subsequent defunding of online holdings does not rely on the user having access to the account or payment instrument(s). The Pilot PSP can still initiate the defunding of the Beta Digital Euro.* If the Individual End-User has coded details, the surrogate value (i.e., token) needs to be disabled. The steps to disable coded details are shown in **[sAM-15]**. *Note: this is the start of the process if the Pilot PSP initiates the offboarding.*

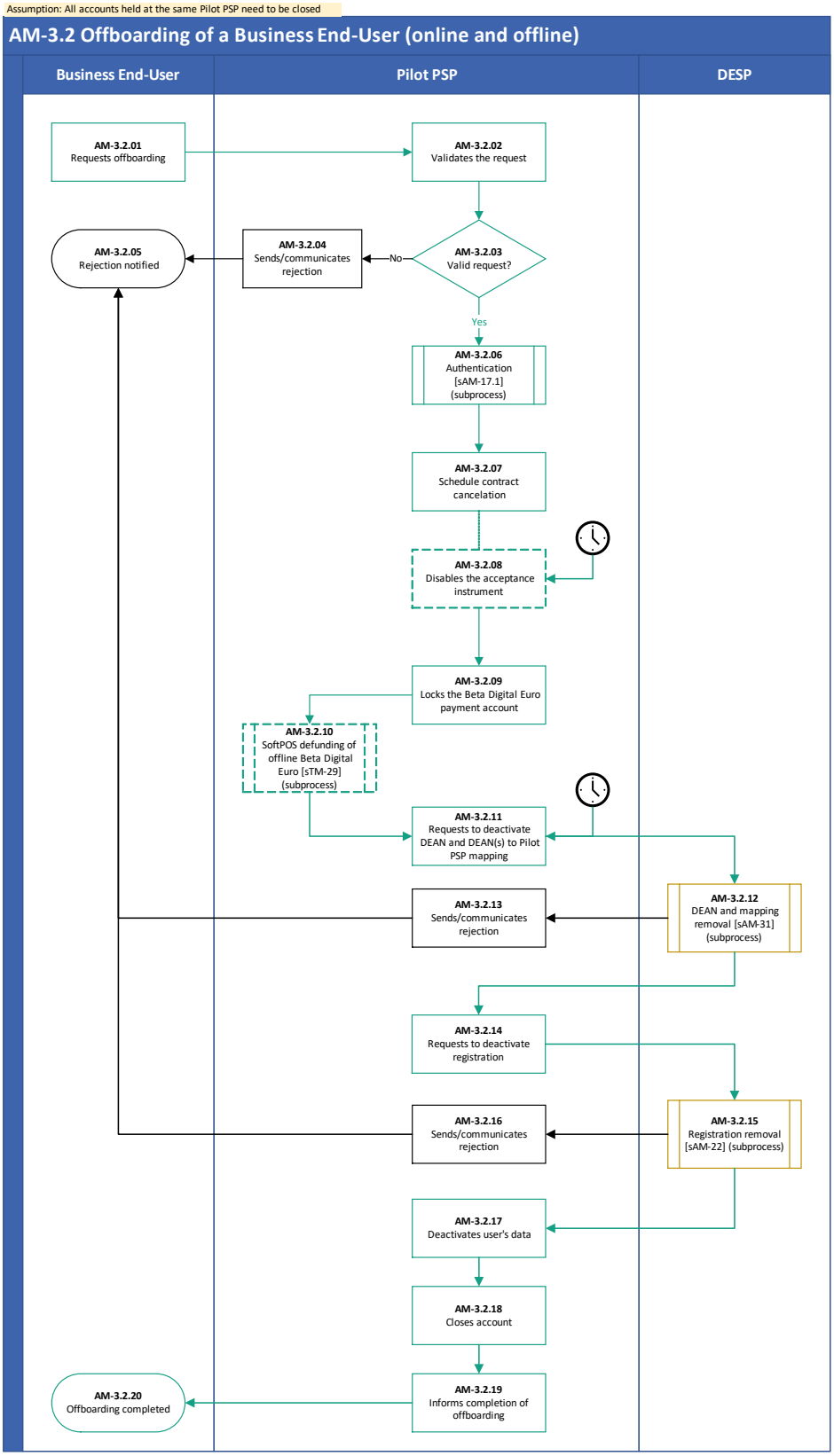
AM-3.1.08	**Disable coded user details [sAM-15]**	Pilot PSP	N/A	The subprocess for disabling coded user details **[sAM-15].** *Step-specific business rules: AM-041-001*
AM-3.1.09	**Zero balance?**	Pilot PSP	N/A	The Pilot PSP checks whether the Beta Digital Euro payment account has remaining funds. *Note: In order for the Pilot PSP to check the offline balance, the offline device needs to go online.* *Step-specific business rules: AM-041-001*
AM-3.1.10	**Checks destination account status**	Pilot PSP	N/A	The Pilot PSP checks whether the destination account of the Individual End-User is valid. *Step-specific business rules: AM-041-001*
AM-3.1.11	**Is the destination account valid?**	Pilot PSP	N/A and/or Individual End-User	If not valid, the Pilot PSP rejects the offboarding request.
AM-3.1.12	**Defunding sub-flow [sLM-24]**	Individual End-User	Pilot PSP	For online, the Pilot PSP initiates the defund of the balance. For offline, the offline secure application triggers the defunding sub-flow. **[sLM-24]**
AM-3.1.13	**Sends/communicates rejection**	Pilot PSP	Individual End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Individual End-User.
AM-3.1.14	**Requests to deactivate DEAN and User Alias to PSP mapping**	Pilot PSP	DESP	The Pilot PSP requests the DESP to deactivate the Individual End-User's DEAN and User Alias to Pilot PSP mapping. *Step-specific business rules: AM-021-008*
AM-3.1.15	**DEAN and mapping removal [sAM-31]**	DESP	Pilot PSP	The DESP initiates the registration and mapping removal (for online and/or offline) **[sAM-31]**.
AM-3.1.16	**Sends/communicates rejection**	Pilot PSP	Individual End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Individual End-User.
AM-3.1.17	**Rejection notified**	Individual End-User	N/A	The Individual End-User is notified of the rejection and the rejection reason.
AM-3.1.18	**Requests to deactivate registration**	Pilot PSP	DESP	The Pilot PSP requests the DESP to deactivate the Individual End-User's registration.
AM-3.1.19	**Registration removal [sAM-22]**	DESP	Pilot PSP	The DESP initiates the registration removal (for online and/or offline) **[sAM-22]**.
AM-3.1.20	**Sends/communicates rejection**	Pilot PSP	Individual End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Individual End-User.
AM-3.1.21	**Deactivates the user's data**	Pilot PSP	N/A	The Pilot PSP receives the confirmation from the DESP and deactivates the Individual End-User's data in its inventory. *Step-specific business rules: AM-041-001*
AM-3.1.22	**Closes account**	Pilot PSP	N/A	The Pilot PSP closes the account of the Individual End-User.

AM-3.1.23	**Disables the payment instrument(s)**	Pilot PSP	N/A	The Pilot PSP disables the online and/or offline payment instrument(s) of the Individual End-User. *Note: Details on the disablement of offline payment instrument(s) are to be defined.* *Step-specific business rules: AM-041-001*
AM-3.1.24	**Informs completion of offboarding**	Pilot PSP	Individual End-User	The Pilot PSP informs the Individual End-User that offboarding is completed and that the Individual End-User would no longer have an account at this Pilot PSP anymore.
AM-3.1.25	**Offboarding completed**	Individual End-User	N/A	Individual End-User is informed that offboarding is completed successfully.

1.3.2 Business End-User offboarding

The following flow presents and depicts the offboarding journey for a Business End-User in online and offline scenario.

Assumption: all accounts will be closed.



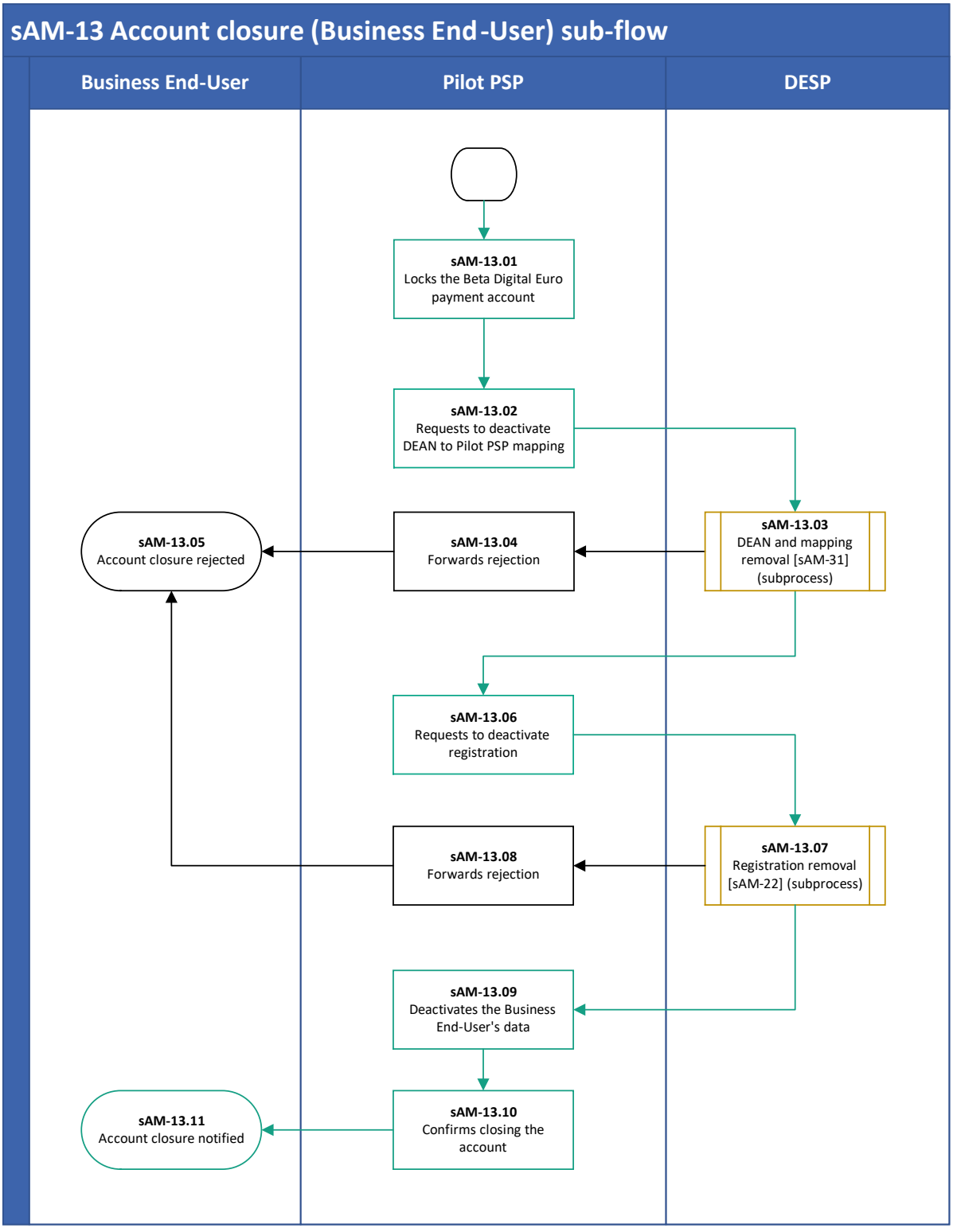
AM-3.2 Offboarding of a Business End-User (online and offline)

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
AM-3.2.01	**Requests offboarding**	Business End-User	Pilot PSP	Business End-User requests to offboard. *Assumption: offboarding of a Business End-User covers closing all the accounts that a Business End-User has with the same Pilot PSP. If the Business End-User has multiple accounts with different Pilot PSP's, the process steps have to be executed multiple times.* *Note: this step is optional. It is not applicable if the Pilot PSP initiates the offboarding.* *Step-specific business rules: AM-040-001*
AM-3.2.02	**Validates the request**	Pilot PSP	N/A	The Pilot PSP validates the request. *Note: this step is optional. The Pilot PSP can initiate the offboarding in this step.* *Step-specific business rules: AM-040-001*
AM-3.2.03	**Valid request?**	Pilot PSP	N/A	If the request is not valid, the Pilot PSP informs the Business End-User that offboarding request is rejected, and the reason for the rejection. *Note: this step is optional. It is not applicable if the Pilot PSP initiates the offboarding.* *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.* *Step-specific business rules: AM-040-001*
AM-3.2.04	**Sends/communicates rejection**	Pilot PSP	Business End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Business End-User.
AM-3.2.05	**Rejection notified**	Business End-User	N/A	The Business End-User is notified of the rejection and the rejection reason. *Note: this step is optional. It is not applicable if the Pilot PSP initiates the offboarding.*
AM-3.2.06	**Authentication [sAM-17.1]**	Pilot PSP	N/A	The Pilot PSP initiates the authentication **[sAM-17.1].** *Note: this step is optional. It is not applicable if the Pilot PSP initiates the offboarding.*
AM-3.2.07	**Schedule contract cancelation**	Pilot PSP	N/A	The Pilot PSP schedules the contract cancelation. *Note: this is the start of the process if the Pilot PSP initiates the offboarding.*
AM-3.2.08	**Disables the acceptance instruments**	Pilot PSP	N/A	**Optional** - once the time is reached, the Pilot PSP disables both online and offline acceptance instruments from the Business End-User. *Note: the acceptance instruments may be provided by another Pilot PSP.* *Step-specific business rules: AM-042-001*
AM-3.2.09	**Locks the Beta Digital Euro payment account**	Pilot PSP	N/A	The Pilot PSP of the Business End-User locks the Beta Digital Euro payment account to prevent further ongoing transactions. *Note: the subsequent defunding of online holdings does not rely on the user having access to the account or payment instrument(s).*

				The Pilot PSP can still initiate the defunding of the Beta Digital Euro. *Note: if the Business End-User has multiple accounts, these steps need to be executed for each account.*
AM-3.2.10	**SoftPOS defunding of offline holdings [sTM-29]**	Pilot PSP	N/A	**Optional** - (in case of offline): The Pilot PSP triggers the defunding of the offline holdings to the Business End-User's commercial bank money account.
AM-3.2.11	**Requests to deactivate DEAN and DEAN(s) to Pilot PSP mapping**	Pilot PSP	DESP	The Pilot PSP requests the DESP to deactivate, for online, the DEAN and DEAN to Pilot PSP mapping. *Note: if the Business End-User has multiple accounts, these steps need to be executed for each account.*
AM-3.2.12	**DEAN and mapping removal [sAM-31]**	DESP	Pilot PSP	The DESP initiates the DEAN and mapping removal (for online) **[sAM-31].**
AM-3.2.13	**Sends/ communicates rejection**	Pilot PSP	Business End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Business End-User.
AM-3.2.14	**Requests to deactivate registration**	Pilot PSP	DESP	The Pilot PSP requests the DESP to deactivate the user registration.
AM-3.2.15	**Registration removal [sAM-22]**	DESP	Pilot PSP	The DESP initiates the registration removal **[sAM-22].**
AM-3.2.16	**Sends/ communicates rejection**	Pilot PSP	Business End-User	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Business End-User.
AM-3.2.17	**Deactivates user's data**	Pilot PSP	N/A	The Pilot PSP deactivates the Business End-User's data in its inventory.
AM-3.2.18	**Closes account**	Pilot PSP	N/A	The Pilot PSP closes the account of the Business End-User.
AM-3.2.19	**Informs completion of offboarding**	Pilot PSP	Business End-User	The Pilot PSP informs the Business End-User that offboarding is completed
AM-3.2.20	**Offboarding completed**	Business End-User	N/A	The Business End-User is informed that offboarding is completed successfully.

1.4 Access management sub-flows

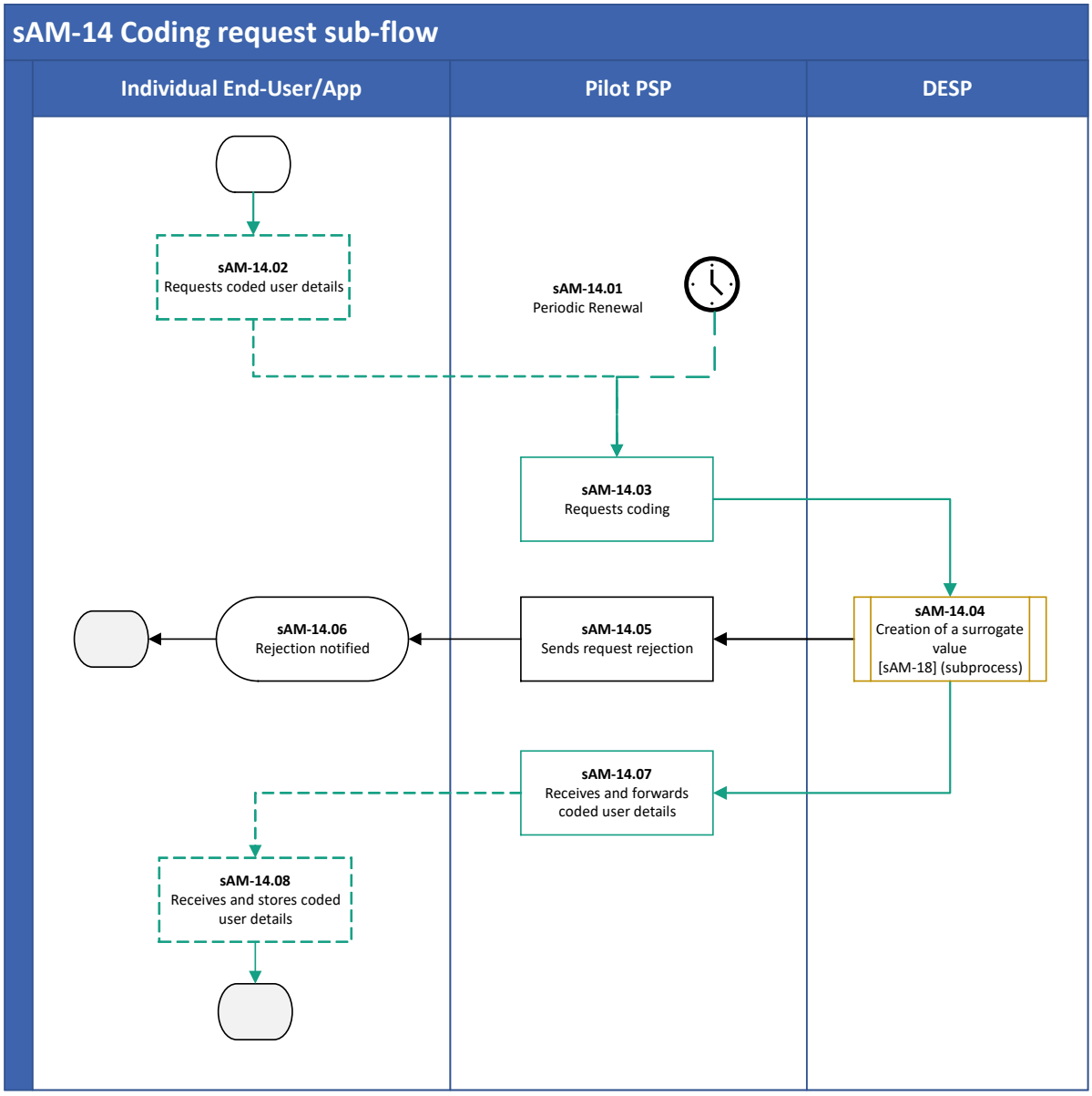
1.4.1 Account closure



sAM-13 Account closure (Business End-User) sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sAM-13.01	**Locks the Beta Digital Euro payment account**	Pilot PSP	N/A	The Pilot PSP of the Business End-User locks the Beta Digital Euro payment account to prevent further and/or ongoing transactions.
sAM-13.02	**Requests to deactivate DEAN to Pilot PSP mapping**	Pilot PSP	DESP	The Pilot PSP requests the DESP to deactivate the DEAN to Pilot PSP mapping update, for online.
sAM-13.03	**DEAN and mapping removal [sAM-31]**	DESP	Pilot PSP	The DESP initiates the DEAN and mapping removal (for online) **[sAM-31].**
sAM-13.04	**Forwards rejection**	Pilot PSP	Business End-User	Pilot PSP forwards account closure rejection and the rejection reason to the Business End-User.
sAM-13.05	**Account closure rejected**	Business End-User	N/A	The Business End-User is informed about the account closure rejection and the rejection reason.
sAM-13.06	**Requests to deactivate registration**	Pilot PSP	DESP	The Pilot PSP requests the DESP to deactivate the End-User's registration.
sAM-13.07	**Registration removal [sAM-22]**	DESP	Pilot PSP	The DESP initiates the registration removal **[sAM-22].**
sAM-13.08	**Forwards rejection**	Pilot PSP	Business End-User	Pilot PSP forwards account closure rejection and the rejection reason to the Business End-User.
sAM-13.09	**Deactivates the Business End-User's data**	Pilot PSP	N/A	Pilot PSP receives the confirmation from the DESP and deactivates the Business End-User's data in its inventory. *Step-specific business rules: AM-042-002*
sAM-13.10	**Confirms closing the account**	Pilot PSP	Business End-User	Pilot PSP prepares confirmation for the Business End-User that the Beta Digital Euro payment account was closed.
sAM-13.11	**Account closure notified**	Business End-User	N/A	Business End-User receives notification of account closure.

1.4.2 Coding request

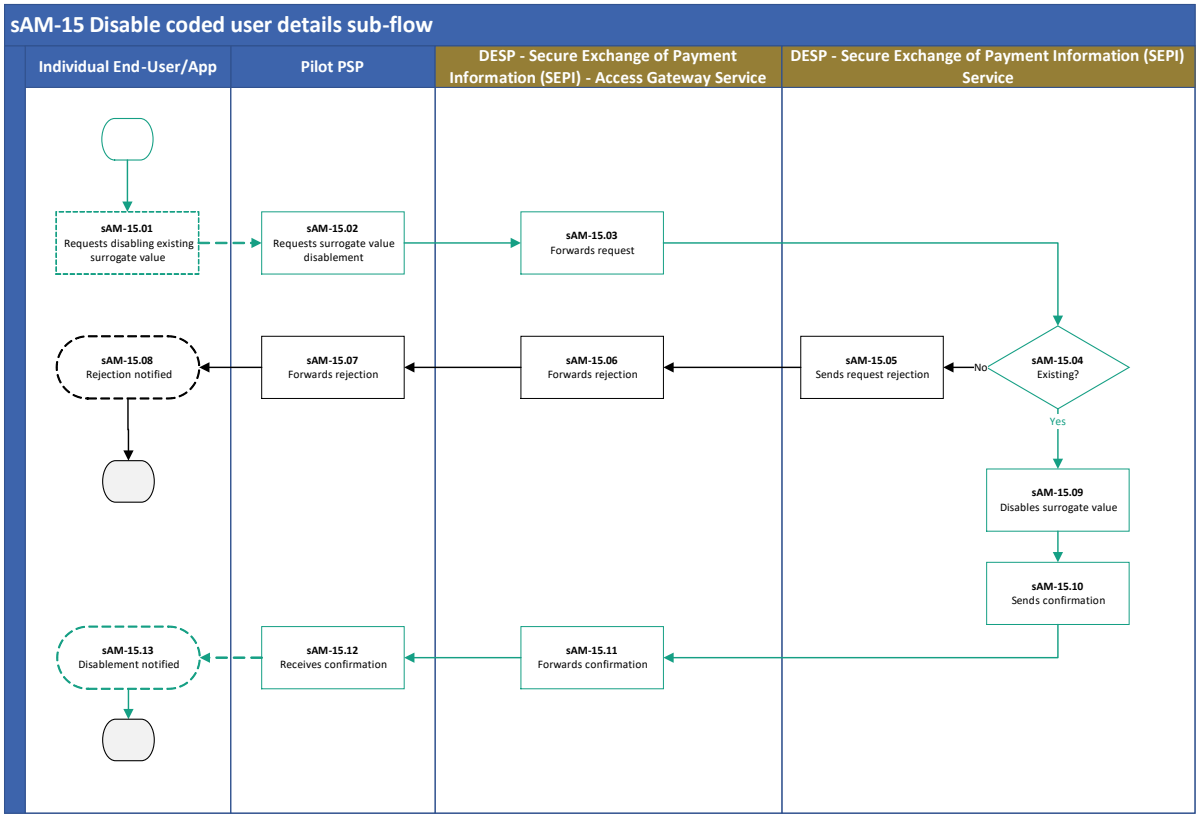


sAM-14 Coding request sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sAM-14.01	**Periodic Renewal**	Pilot PSP	N/A	**Optional** - The stored coded user details' validity is expected to expire after a pre-defined period of time and needs to be renewed before that happens.
sAM-14.02	**Requests coded user details**	Individual End-User/App	Pilot PSP	**Optional** - Individual End-User can request/update a service that requires a coded user details to be used and the app shall request the coded user details.
sAM-14.03	**Requests coding**	Pilot PSP	DESP	The Payer's PSP sends a coding request to the coding service which is part of the DESP (i.e., Secure Exchange of Payment Information (SEPI) Service).

sAM-14.04	**Creation of a surrogate value [sAM-18]**	DESP	PSP	The DESP initiates the creation of a surrogate value **[sAM-18].**
sAM-14.05	**Sends request rejection**	Pilot PSP	Individual End-User/App	The Pilot PSP sends the rejection about the request and the rejection reason to the Individual End-User/app.
sAM-14.06	**Rejection notified**	Individual End-User/App	N/A	The Individual End-User/app is notified about the rejection and the rejection reason.
sAM-14.07	**Receives and forwards coded user details**	Pilot PSP	Individual End-User/App	The Pilot PSP receives the coded user details, stores it, and forwards it to the app.
sAM-14.08	**Receives and stores coded user details**	Individual End-User/App	N/A	**Optional** - the app receives the coded user details and stores it (for future use) on the device.

1.4.3 Disable coded user details



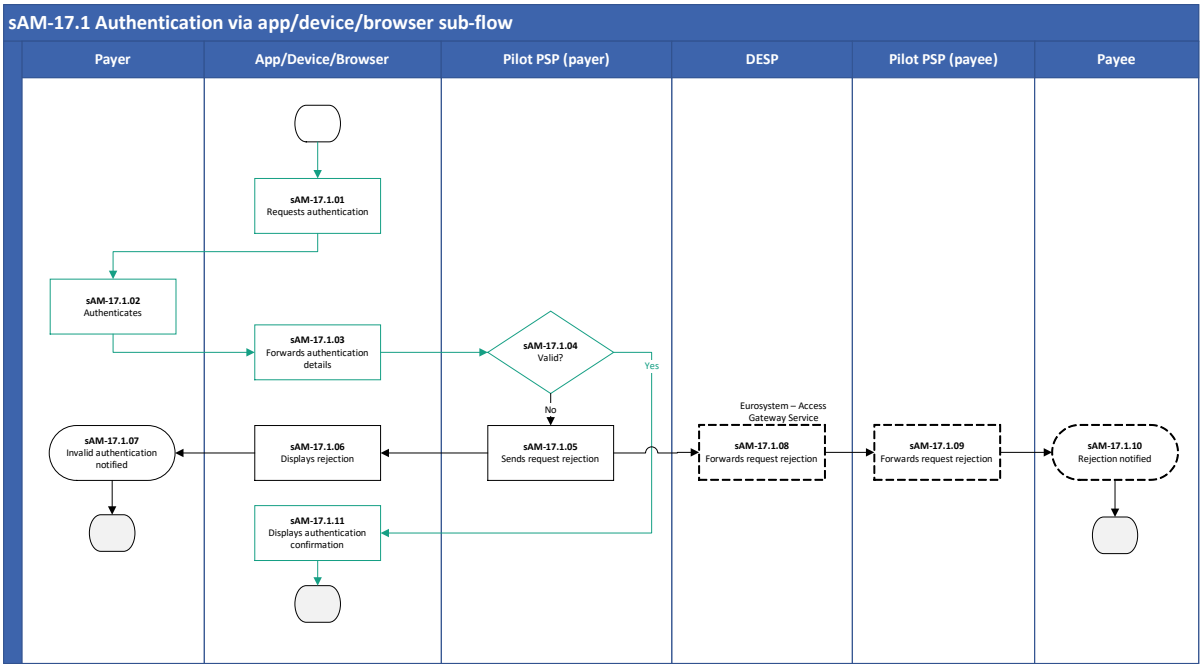
sAM-15 Disable coded user details sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sAM-15.01	**Requests disabling existing surrogate value**	Individual End-User/App	Pilot PSP	**Optional** - the app requests surrogate value disablement by the Pilot PSP.
sAM-15.02	**Requests surrogate value disablement**	Pilot PSP	DESP - Secure Exchange of Payment Information (SEPI) - Access Gateway Service	The Pilot PSP sends a surrogate value disablement request to the Secure Exchange of Payment Information (SEPI) - Access Gateway Service.
sAM-15.03	**Forwards request**	DESP – Secure Exchange of Payment Information (SEPI) - Access Gateway Service	DESP – Secure Exchange of Payment Information (SEPI) Service	The Secure Exchange of Payment Information (SEPI) – Access Gateway Service forwards the request to the Secure Exchange of Payment Information (SEPI) Service component where the coding services checks if the surrogate value exist.
sAM-15.04	**Existing?**	DESP – Secure Exchange of Payment Information (SEPI) Service	N/A	If the surrogate value exists and it is valid, it will be disabled, otherwise the request will be rejected.
sAM-15.05	**Sends request rejection**	DESP - Secure Exchange of Payment Information (SEPI) Service	DESP – Secure Exchange of Payment Information (SEPI) - Access Gateway Service	If the surrogate value does not exist or is not valid, the Secure Exchange of Payment Information (SEPI) Service rejects the request and notifies the Secure Exchange of Payment Information (SEPI) – Access Gateway Service.
sAM-15.06	**Forwards rejection**	DESP – Secure Exchange of Payment Information (SEPI) - Access Gateway Service	Pilot PSP	If the surrogate value does not exist or is not valid, the Secure Exchange of Payment Information (SEPI) – Access Gateway Service notifies the Pilot PSP by forwarding the rejection and the rejection reason.
sAM-15.07	**Forwards rejection**	Pilot PSP	Individual End-User/App	The Pilot PSP is notified about the rejection and the rejection reason. **Optional** - if the request comes from the app, the Pilot PSP forwards the rejection and the rejection reason to the app.
sAM-15.08	**Rejection notified**	Individual End-User/App	N/A	**Optional** - the app is notified about the rejection and the rejection reason.
sAM-15.09	**Disables surrogate value**	DESP - Secure Exchange of Payment	N/A	The Secure Exchange of Payment Information (SEPI) Service disables the surrogate value.

		Information (SEPI) Service		
sAM-15.10	**Sends confirmation**	DESP - Secure Exchange of Payment Information (SEPI) Service	DESP – Secure Exchange of Payment Information (SEPI) - Access Gateway Service	The Secure Exchange of Payment Information (SEPI) Service sends a confirmation to the Secure Exchange of Payment Information (SEPI) – Access Gateway Service that the surrogate value is disabled.
sAM-15.11	**Forwards confirmation**	DESP – Secure Exchange of Payment Information (SEPI) - Access Gateway Service	Pilot PSP	The Secure Exchange of Payment Information (SEPI) - Access Gateway Service forwards the confirmation to the Pilot PSP that the surrogate value is disabled.
sAM-15.12	**Receives confirmation**	Pilot PSP	Individual End-User/App	The Pilot PSP receives the confirmation that the surrogate value is disabled.
sAM-15.13	**Disablement notified**	Individual End-User/App	N/A	**Optional** - the app is notified that the request is completed.

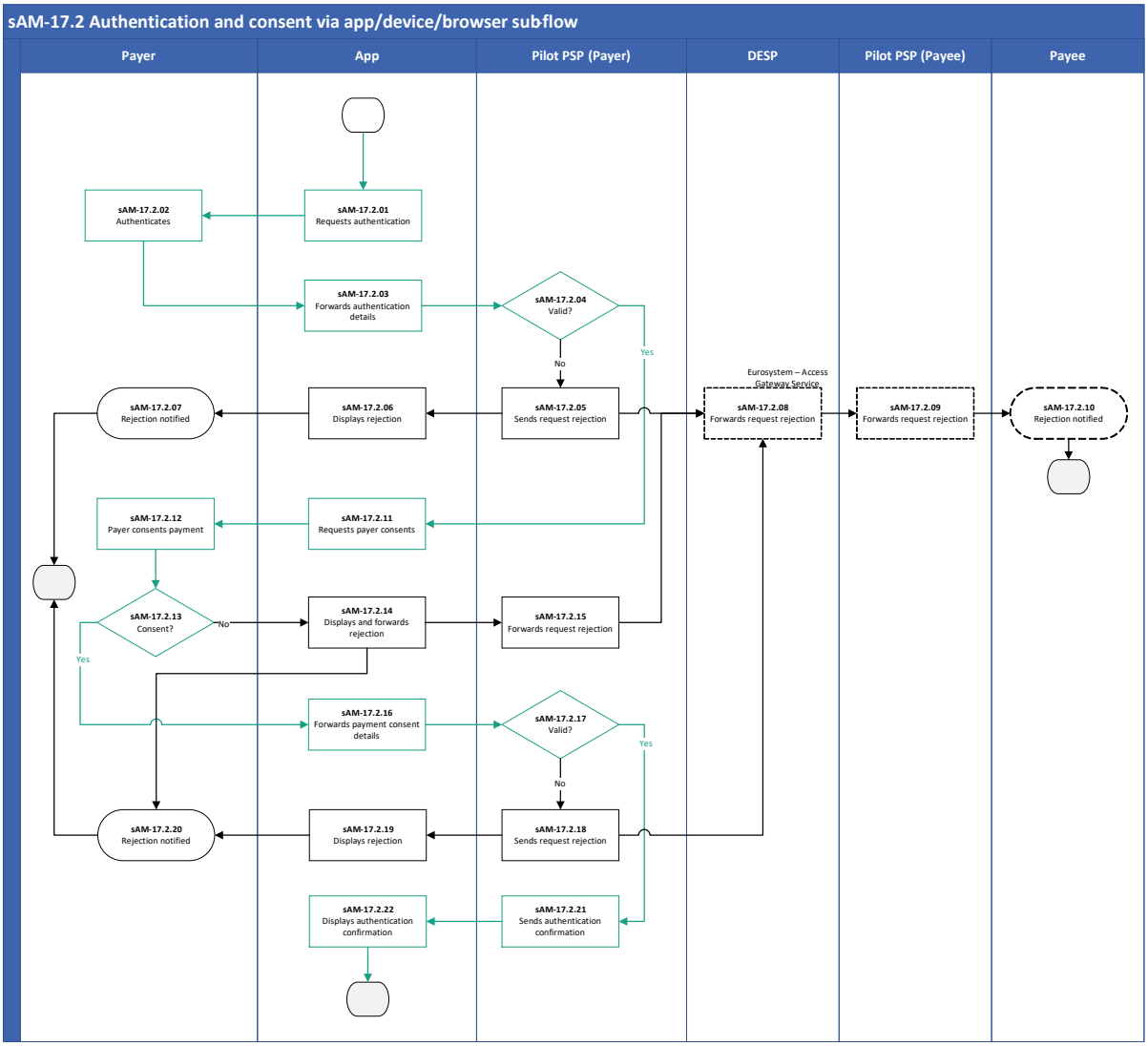
1.4.4 Individual End-User authentication

Authentication can be done (i) via app (either Eurosystem-provided app or proprietary Pilot PSP app), (ii) via device or iii) via browser.



sAM-17.1 Authentication via app, device or browser sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sAM-17.1.01	**Requests authentication**	App/Device/ Browser	Payer	The app/device/ browser requests the authentication of the Payer to continue with the request.
sAM-17.1.02	**Authenticates**	Payer	App/Device/ Browser	The Payer authenticates via the app/device/browser.
sAM-17.1.03	**Forwards authentication details**	App/Device/ Browser	Pilot PSP (payer)	The app/device/browser forwards the authentication details to the Pilot PSP (Payer) to check.
sAM-17.1.04	**Valid?**	Pilot PSP (payer)	N/A and/or App/Device/ Browser	The Pilot PSP checks if the authentication provided by the Payer is valid. If not, the Payer could retry. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
sAM-17.1.05	**Sends request rejection**	Pilot PSP (payer)	App/Device/ Browser and/or DESP	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the app/device/browser and eventually to the DESP.
sAM-17.1.06	**Displays rejection**	App/Device/ Browser	Payer	The app/device/ browser displays the authentication rejection.
sAM-17.1.07	**Invalid authentication notified**	Payer	N/A	Payer is notified of the rejection and the rejection reason.
sAM-17.1.08	**Forwards request rejection**	DESP	PSP (payee)	**Optional** - The Eurosystem - Access Gateway Service forwards the payment rejection to the Pilot PSP of the Payee. *Note: If involved in the payment process, the Payee is informed of the rejection.*
sAM-17.1.09	**Forwards request rejection**	Pilot PSP (payee)	Payee	**Optional** - The Pilot PSP forwards the payment rejection to the Payee.
sAM-17.1.10	**Rejection notified**	Payee	N/A	**Optional** - Payee is notified of the rejection and the rejection reason.
sAM-17.1.11	**Displays authentication confirmation**	App/Device/ Browser	N/A	The app/device/ browser displays the authentication confirmation.

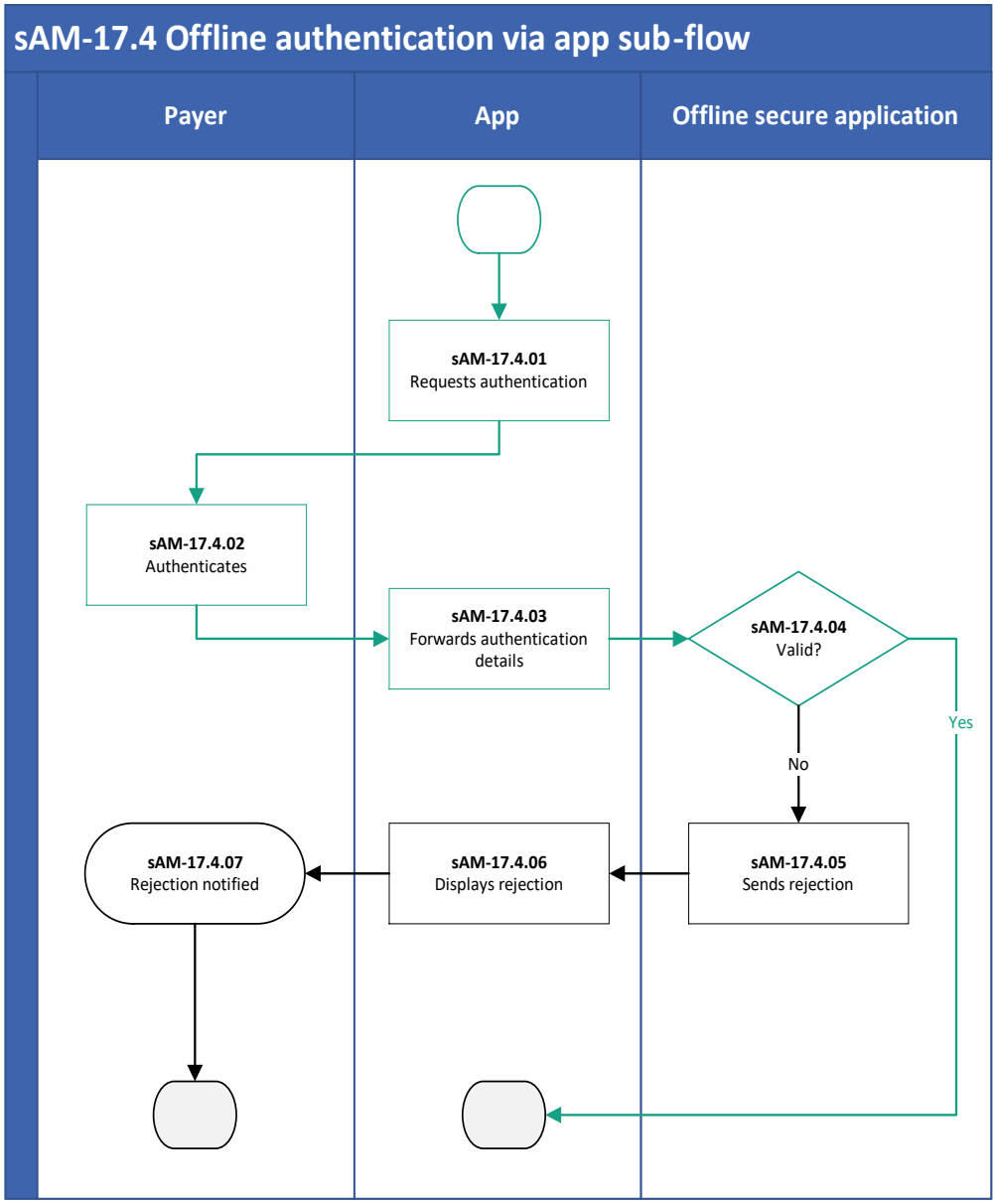


sAM-17.2 Authentication and consent via app, device or browser sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sAM-17.2.01	**Requests authentication**	App/Device/ Browser	Payer	The app/device/browser requests the authentication of the Payer to continue with the request.
sAM-17.2.02	**Authenticates**	Payer	App/Device/ Browser	The Payer authenticates via the app/device/browser.
sAM-17.2.03	**Forwards authentication details**	App/Device/ Browser	Pilot PSP (Payer)	The app/device/browser forwards the authentication details to the Pilot PSP (Payer) to check.
sAM-17.2.04	**Valid?**	Pilot PSP (Payer)	N/A and/or App /Device/Browser	The Pilot PSP decides if the authentication provided by the Payer is valid. If not, the Payer could retry. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business*

				rules.
sAM-17.2.05	**Sends request rejection**	Pilot PSP (Payer)	App /Device/Browser and/or DESP	The Pilot PSP (Payer) rejects the request and sends a rejection message specifying the error type to the app/device/browser and eventually to the DESP.
sAM-17.2.06	**Displays rejection**	App/Device/ Browser	Payer	The app/device/browser displays the authentication rejection.
sAM-17.2.07	**Rejection notified**	Payer	N/A	The Payer is notified of the rejection and the rejection reason.
sAM-17.2.08	**Forwards request rejection**	DESP	Pilot PSP (Payee)	**Optional** - The Eurosystem - Access Gateway Service forwards the payment rejection to the Payee's Pilot PSP. *Note: If involved in the payment process, the Payee is informed of the rejection.*
sAM-17.2.09	**Forwards request rejection**	Pilot PSP (Payee)	Payee	The Payee's Pilot PSP forwards the payment rejection to the Payee.
sAM-17.2.10	**Rejection notified**	Payee	N/A	**Optional** - The Payee is notified of the rejection and the rejection reason.
sAM-17.2.11	**Requests payer consents**	App/Device/ Browser	Payer	The app/device/ browser requests consents from the Payer for the payment. *Note: for flows where authentication happens on the device, Payer consent happens at app level.*
sAM-17.2.12	**Payer consents payment**	Payer	N/A	The Payer consents with the payment via the app/device/browser.
sAM-17.2.13	**Consent?**	Payer	App/Device/ Browser	If payment is not consented to by the Payer, it is rejected.
sAM-17.2.14	**Displays and forwards rejection**	App/Device/ Browser	Payer and/or PSP (Payer)	The app/device/browser displays the Payer's rejection and forwards it to the Pilot PSP (Payer) specifying the error type.
sAM-17.2.15	**Forwards request rejection**	Pilot PSP (Payer)	DESP	**Optional** - the Pilot PSP (Payer) forwards the rejection message to the DESP.
sAM-17.2.16	**Forwards payment consent details**	App/Device/ Browser	PSP (Payer)	The app/device/browser forwards the payment consent details to the Pilot PSP (Payer) to check.
sAM-17.2.17	**Valid?**	Pilot PSP (Payer)	N/A	The Pilot PSP (Payer) decides if the payment consent provided by the Payer is valid. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
sAM-17.2.18	**Sends request rejection**	Pilot PSP (Payer)	App/Device/ Browser and/or DESP	The Pilot PSP (Payer) rejects the request and sends a rejection message specifying the error type to the app/device/browser and eventually to the DESP.
sAM-17.2.19	**Displays rejection**	App/Device/ Browser	Payer	The app/device/browser displays the authentication rejection.

sAM-17.2.20	**Rejection notified**	Payer	N/A	The Payer is notified of the rejection and the rejection reason.
sAM-17.2.21	**Sends authentication confirmation**	Pilot PSP (Payer)	App/Device/ Browser	The Pilot PSP (Payer) sends an authentication confirmation to the app/device/browser.
sAM-17.2.22	**Displays authentication confirmation**	App/Device/ Browser	N/A	The app/device/ browser displays the authentication confirmation.

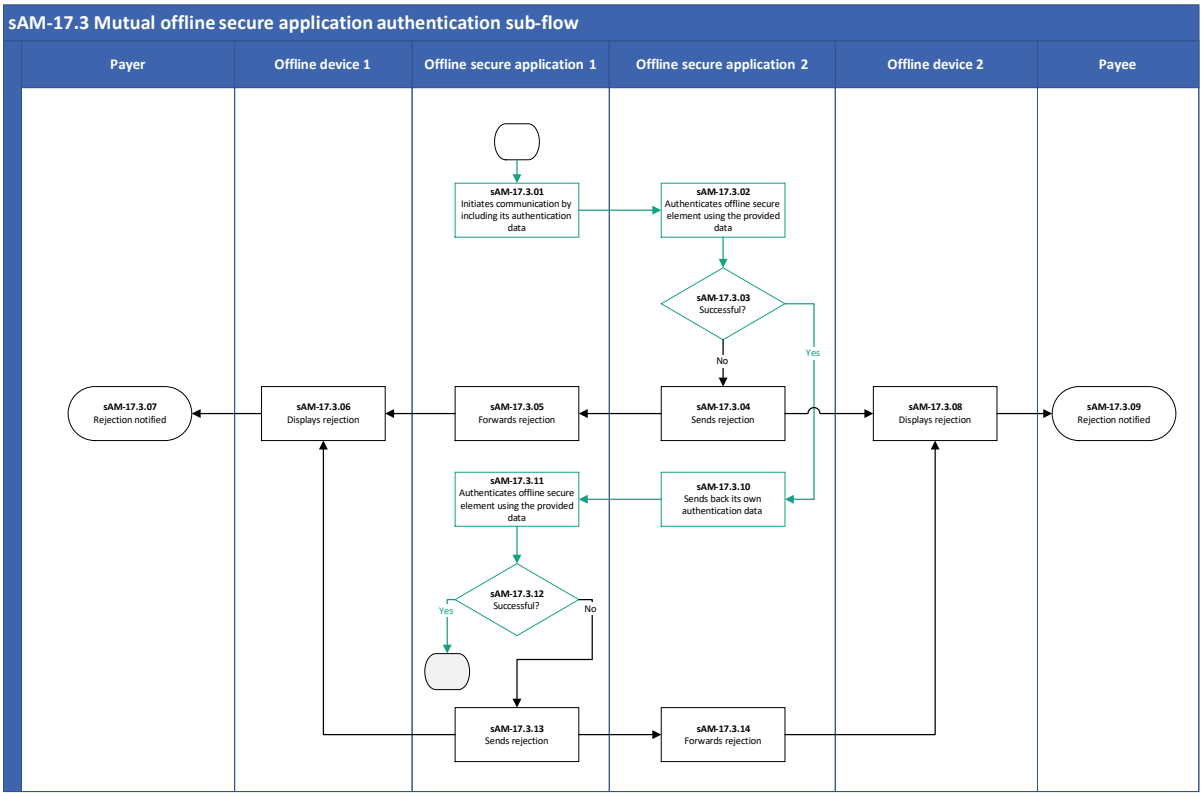


sAM-17.4 Offline authentication sub-flow via app

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition

sAM-17.4.01	**Requests authentication**	App	Payer	The app requests the authentication of the payer to continue with the request.
sAM-17.4.02	**Authenticates**	Payer	App	The payer authenticates via the app.
sAM-17.4.03	**Forwards authentication details**	App	Offline secure application	The app forwards the authentication details to the offline secure application to check.
sAM-17.4.04	**Valid?**	Offline secure application	N/A and/or App	The offline secure application checks if the authentication provided by the payer is valid. If not, the payer could retry. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
sAM-17.4.05	**Sends rejection**	Offline secure application	App	The offline secure application rejects the request and sends a rejection message specifying the error type to the app.
sAM-17.4.06	**Displays rejection**	App	Payer	The app displays the authentication rejection with the rejection reason.
sAM-17.4.07	**Rejection notified**	Payer	N/A	The payer is notified of the rejection and the rejection reason.

1.4.5 Device authentication

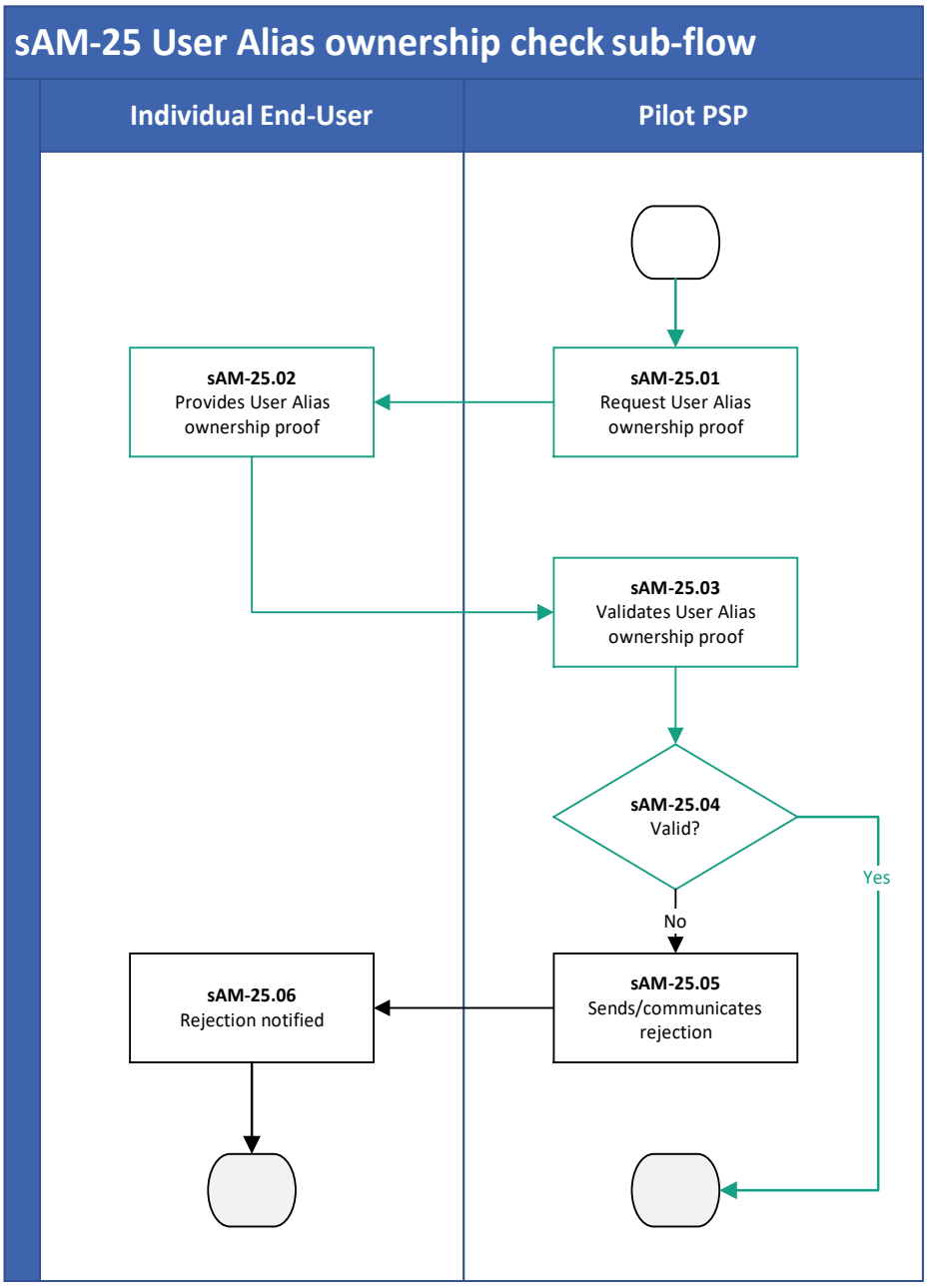


sAM-17.3 Mutual offline secure application authentication sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sAM-17.3.01	**Initiates communication by including its authentication data**	Offline secure application 1	Offline secure application 2	The offline secure application 1 initiates communication with the offline secure application 2 by providing the authentication data.
sAM-17.3.02	**Authenticates offline secure element using the provided data**	Offline secure application 2	N/A	The offline secure application 2 authenticates the provided data from the offline secure application 1.
sAM-17.3.03	**Successful?**	Offline secure application 2	N/A	If the authentication is not successful, the offline secure application 2 rejects the request and communicates the rejection to the offline secure application 1 and to the Payee via the offline device 2.
sAM-17.3.04	**Sends rejection**	Offline secure application 2	Offline secure application 1 and/or Offline device 2	The offline secure application 2 rejects the request and sends a rejection message specifying the error type the offline secure application 1 and to the offline device 2.

sAM-17.3.05	**Forwards rejection**	Offline secure application 1	Offline device 1	The offline secure application 1 forwards the rejection and the rejection reason to the offline device 1.
sAM-17.3.06	**Displays rejection**	Offline device 1	Payer	The offline device 1 displays the rejection and the reason to the Payer.
sAM-17.3.07	**Rejection notified**	Payer	N/A	Payer is notified of the rejection and the rejection reason.
sAM-17.3.08	**Displays rejection**	Offline device 2	Payee	The offline device 2 displays the rejection and the reason to the Payee.
sAM-17.3.09	**Rejection notified**	End-User 2	N/A	The Payee is notified of the rejection and the rejection reason.
sAM-17.3.10	**Sends back its own authentication data**	Offline secure application 2	Offline secure application 1	After a successful authentication, the offline secure application of offline device 2 sends the data back to the offline secure application 1.
sAM-17.3.11	**Authenticates offline secure element using the provided data**	Offline secure application 1	N/A	The offline secure application 1 authenticates the provided data from the offline secure application 2.
sAM-17.3.12	**Successful?**	Offline secure application 1	N/A	If the authentication is not successful, the offline secure application 1 rejects the request and informs the offline device 1 and the offline secure application 2.
sAM-17.3.13	**Sends rejection**	Offline secure application 1	Offline device 1 and/or Offline secure application 2	The offline device 2 rejects the request and sends a rejection message specifying the error type to the offline device 1 and the offline secure application 2.
sAM-17.3.14	**Forwards rejection**	Offline secure application 2	Offline device 2	The offline secure application 2 forwards the rejection and the rejection reason to the offline device 2.

1.4.6 ~~Alias~~User Alias ownership check



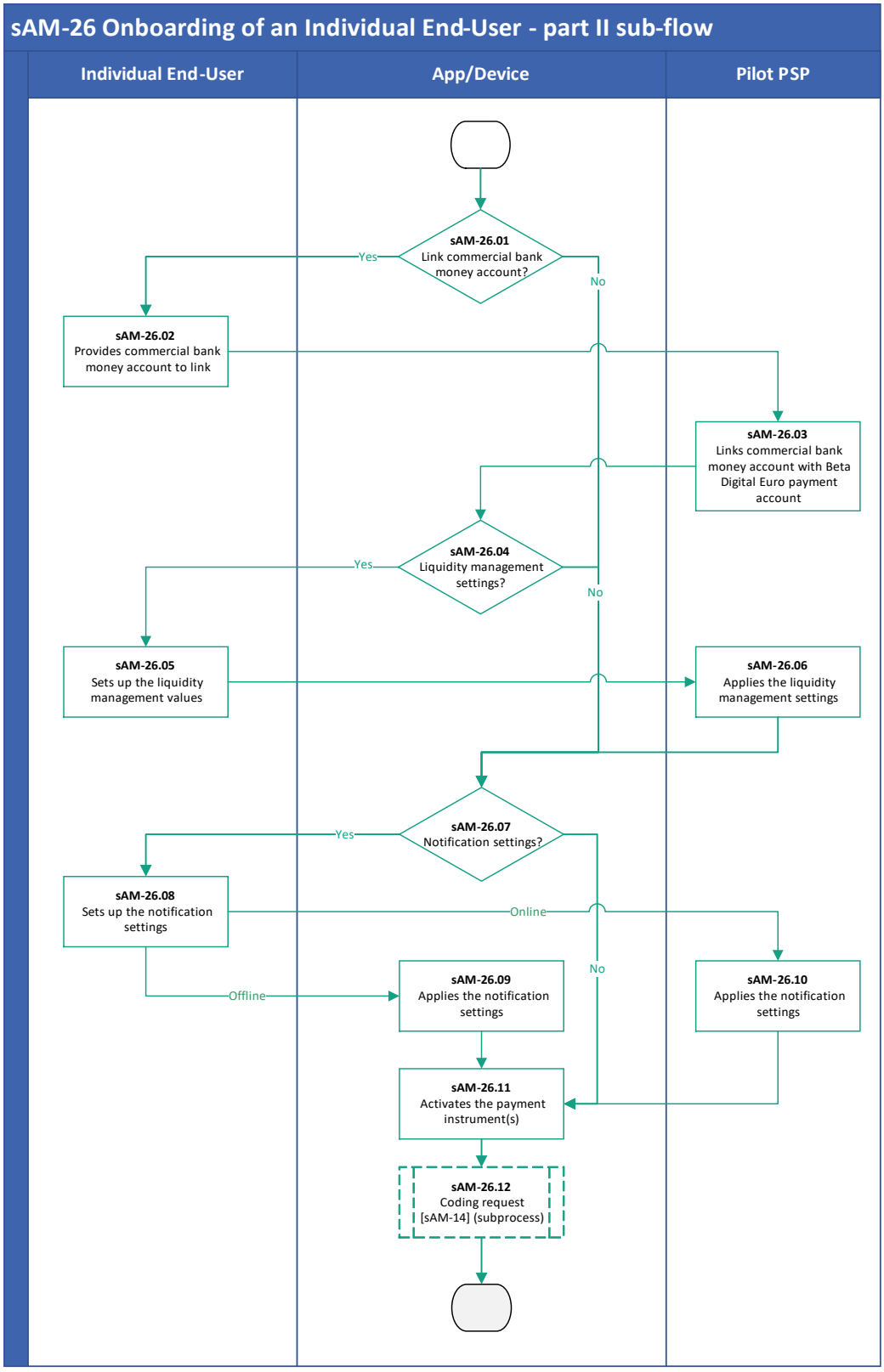
sAM-25 User Alias ownership check sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sAM-25.01	**Request User Alias ownership proof**	Pilot PSP	Individual End-User	The Pilot PSP requests the Individual End-User for proof of User Alias ownership. *Step-specific business rules: AM-021-007, AM-021-009*

sAM-25.02	**Provides User Alias ownership proof**	Individual End-User	Pilot PSP	The Individual End-User provides User Alias ownership proof to the Pilot PSP.
sAM-25.03	**Validates User Alias ownership proof**	Pilot PSP	N/A	The Pilot PSP validates if the User Alias ownership proof is valid or not. *Step-specific business rules: AM-021-007, AM-021-009*
sAM-25.04	**Valid?**	Pilot PSP	N/A	If the proof is not valid, the User Alias is rejected. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.* *Step-specific business rules: AM-021-007, AM-021-009*
sAM-25.05	**Sends/ communicates rejection**	Pilot PSP	Individual End-User	The Pilot PSP rejects the User Alias and the request and sends a rejection message specifying the error type to the Individual End-User.
sAM-25.06	**Rejection notified**	Individual End-User	N/A	The Individual End-User is notified of the rejection and the rejection reason.

1.4.7 Onboarding of an Individual End-User – part II

The steps characterising the onboarding of an Individual End-User (part II) in online and offline scenario (known and unknown to the Pilot PSP) are presented and depicted in the following flow. The flow has been depicted under the assumption that the Individual End-User is allowed to have a single Beta Digital Euro payment account.



sAM-26 Onboarding of an Individual End-User - part II sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sAM-26.01	**Link commercial bank money account?**	App/Device	Individual End-User and/or N/A	If an Individual End-User wants to link their commercial bank money account, they will be requested to link. Otherwise, the Individual End-User proceeds with settings. *Step-specific business rules: AM-021-014*
sAM-26.02	**Provides commercial bank money account to link**	Individual End-User	Pilot PSP	The Individual End-User provides the commercial bank money account to link to their Beta Digital Euro payment account.
sAM-26.03	**Links commercial bank money account with Beta Digital Euro payment account**	Pilot PSP	App/Device	The Pilot PSP links the commercial bank money account of the Individual End-User to the DEAN. *Step-specific business rules: AM-020-001, AM-021-014*
sAM-26.04	**Liquidity management settings?**	App/Device	Individual End-User and/or N/A	The app/device determines whether the Individual End-User proceeds with liquidity management settings. *Step-specific business rules: LM-021-006, LM-031-001, LM-031-002, LM-041-002, LM-041-004, LM-050-003, LM-051-001*
sAM-26.05	**Sets up the liquidity management values**	Individual End-User	Pilot PSP	The Individual End-User sets up the liquidity settings.
sAM-26.06	**Applies the liquidity management settings**	Pilot PSP	App/Device	The Pilot PSP applies the liquidity management settings that Individual End-User entered. *Step-specific business rules: LM-021-006, LM-031-001, LM-031-002, LM-041-002, LM-041-004, LM-051-001*
sAM-26.07	**Notification settings?**	App/Device	Individual End-User and/or N/A	The app/device determines whether the Individual End-User proceeds with setting up the notifications. *Step-specific business rules: AM-021-011, AM-021-012*
sAM-26.08	**Sets up the notification settings**	Individual End-User	App/Device and/or Pilot PSP	The Individual End-User sets up the notification settings.
sAM-26.09	**Applies the notification settings**	App/Device	N/A	For offline, the app/device applies the notification settings that Individual End-User entered. *Step-specific business rules: AM-021-011, AM-021-012*
sAM-26.10	**Applies the notification settings**	Pilot PSP	App/Device	For onboarding to online services or both offline and online, the Pilot PSP applies the notification settings that Individual End-User entered.
sAM-26.11	**Activates the payment instrument(s)**	App/Device	N/A	The Pilot PSP enables the online and/or offline payment instrument(s) for the Individual End-User. For the offline applet, this is subject to a previous successful deployment. *Step-specific business rules: AM-021-017*

sAM-26.12	**Coding request [sAM-14]**	App/Device	N/A	**Optional** - The Pilot PSP initiates the coding request **[sAM-14]** to generate a coded user's detail to use in NFC payments. *Note: not applicable for offline*

2. Liquidity management

General business rules that refer to the liquidity management flows: LM-030-001, LM-050-001.

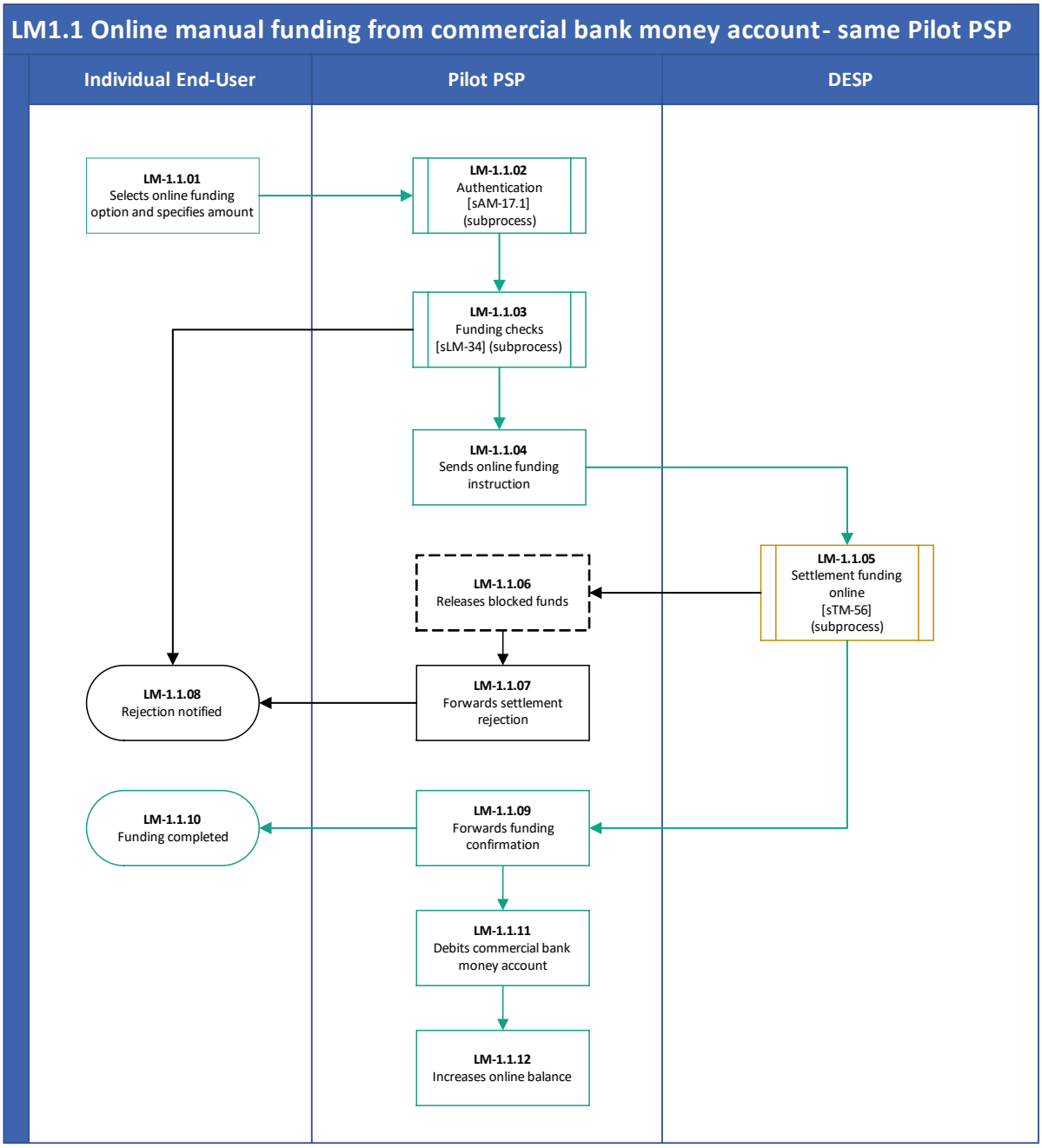
2.1 Funding

General business rules that refer to the funding flows: *LM-020-001*

Pilot PSPs have the obligation to establish processes to help Individual End-User funding their Beta Digital Euro payment accounts. Funding can be done from a commercial bank money account.

2.1.1 Online manual funding from commercial bank money account - same Pilot PSP

The steps characterising manual funding from commercial bank money account at the same Pilot PSP are presented and depicted in the following flow*:*



LM-1.1 Online manual funding from commercial bank money account - same Pilot PSP

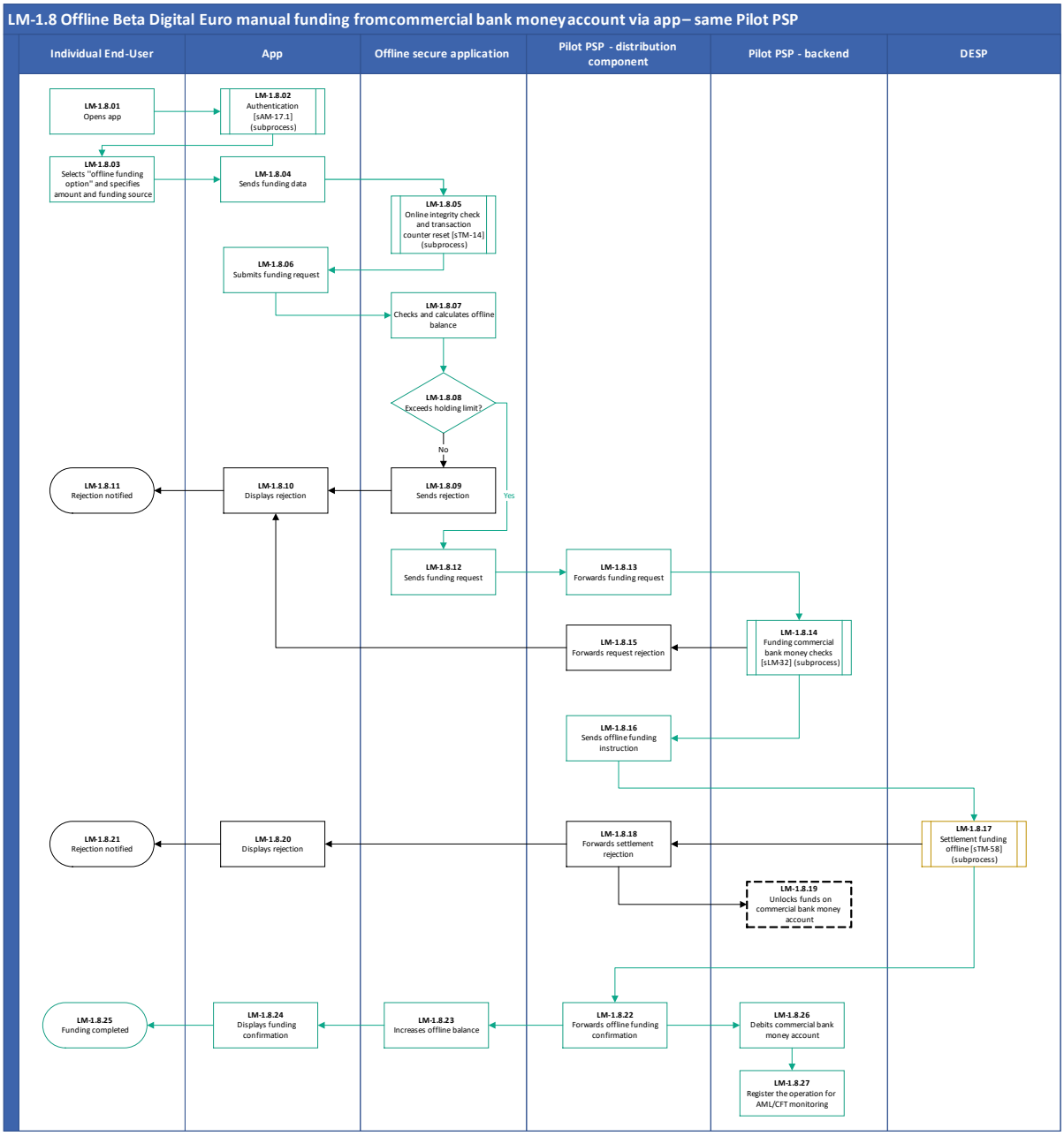
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
LM-1.1.01	**Selects online funding option and specifies amount**	Individual End-User	Pilot PSP	The Individual End-User opens the app (if required), selects the online funding option from the menu and specifies the amount to be funded as well as the source owned account in commercial bank money account. If the Individual End-User has linked an account, this account should be the default source account.

				The amount must be below the holding limit.
LM-1.1.02	**Authentication [sAM-17.1]**	Pilot PSP	N/A	The Pilot PSP initiates the authentication **[sAM-17.1].**
LM-1.1.03	**Funding checks [sLM-34]**	Pilot PSP	Individual End-User and/or N/A	The Pilot PSP performs the funding checks **[sLM-34].**
LM-1.1.04	**Sends online funding instruction**	Pilot PSP	DESP	The Individual End-User's Pilot PSP sends a funding instruction to DESP.
LM-1.1.05	**Settlement funding online [sTM-56]**	DESP	Pilot PSP	The DESP initiates the settlement funding online **[sTM-56].**
LM-1.1.06	**Releases blocked funds**	Pilot PSP	N/A	Optional - The Pilot PSP is notified about the rejection and the rejection reason and releases the blocked funds on the commercial bank money account of the Individual End-User.
LM-1.1.07	**Forwards settlement rejection**	Pilot PSP	Individual End-User	The Pilot PSP forwards the settlement rejection and the rejection reason to the Individual End-User.
LM-1.1.08	**Rejection notified**	Individual End-User	N/A	The Individual End-User is notified about the rejection and the rejection reason.
LM-1.1.09	**Forwards funding confirmation**	Pilot PSP	Individual End-User and/or N/A	The Pilot PSP is notified about the funding confirmation and informs the Individual End-User about the funding.
LM-1.1.10	**Funding completed**	Individual End-User	N/A	The Individual End-User is informed that the funding operation has been completed successfully.
LM-1.1.11	**Debits commercial bank money account**	Pilot PSP	N/A	The Pilot PSP replaces the amount reservation on the Individual End-User's commercial bank money account by a debit posting (if the amount was initially blocked instead of debited, this is up to the Pilot PSP).
LM-1.1.12	**Increases online balance**	Pilot PSP	N/A	The Pilot PSP increases the online balance of the Individual End-User.

2.1.2 Offline Beta Digital Euro manual funding from commercial bank money account via app – same Pilot PSP

The steps characterising offline manual funding from commercial bank money account at the same Pilot PSP via app (either Eurosystem-provided app or proprietary Pilot PSP app) are presented and depicted in the following flow:

Assumption: the app requires an online connection. The offline wallet is installed on the Individual End-User's mobile device.



LM-1.8 Offline Beta Digital Euro manual funding from commercial bank money account via app - same Pilot PSP

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
LM-1.8.01	**Opens app**	Individual End-User	App	The Individual End-User opens app.
LM-1.8.02	**Authentication [sAM-17.1]**	App	Individual End-User	The Individual End-User' app initiates **authentication [sAM-17.1]**.
LM-1.8.03	**Selects "offline funding option" and specifies**	Individual End-User	App	The Individual End-User selects the "offline account funding option", specifies the amount as well as the source owned commercial bank money account. If

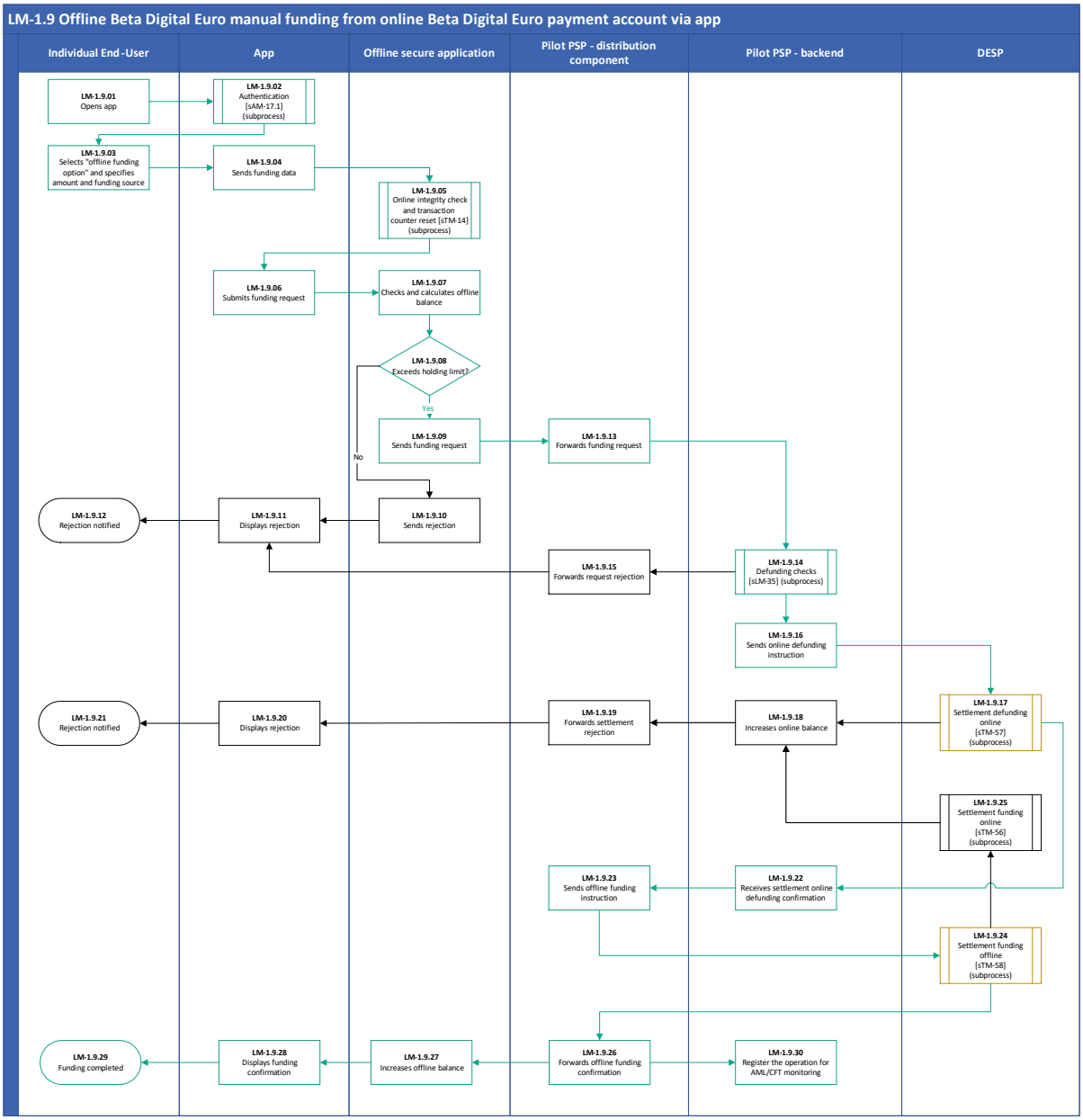
	amount and funding source			the Individual End-User has linked an account, this account should be the default source account. *Precondition: the Individual End-User's device must be connected to the internet.*
LM-1.8.04	**Sends funding data**	App	Offline secure application	The app sends the funding data to the offline secure application.
LM-1.8.05	**Online integrity check and transaction counter reset [sTM-14]**	Offline secure application	App	The offline secure application performs online integrity check and transaction counter reset **[sTM-14]**.
LM-1.8.06	**Submits funding request**	App	Offline secure application	The Individual End-User's app submits a funding request for the funding amount specified by the Individual End-User to the offline secure application.
LM-1.8.07	**Checks and calculates offline balance**	Offline secure application	N/A	The offline secure application checks and calculates the new offline balance to check if it exceeds the holding limit.
LM-1.8.08	**Exceeds holding limit?**	Offline secure application	N/A	If the new calculated offline balance exceeds the holding limit, the offline secure application rejects the funding request.
LM-1.8.09	**Sends rejection**	Offline secure application	App	The offline secure application rejects the funding and sends a rejection message specifying the error type to the app.
LM-1.8.10	**Displays rejection**	App	Individual End-User	The Individual End-User's app displays a rejection message with the rejection reason to the Individual End-User.
LM-1.8.11	**Rejection notified**	Individual End-User	N/A	The Individual End-User is informed of the rejection and the rejection reason.
LM-1.8.12	**Sends funding request**	Offline secure application	Pilot PSP - distribution component	The offline secure application sends the offline funding request to the Pilot PSP - distribution component.
LM-1.8.13	**Forwards funding request**	Pilot PSP - distribution component	Pilot PSP - backend	The Pilot PSP - distribution forwards the funding request to the Pilot PSP - backend.
LM-1.8.14	**Funding commercial bank money checks [sLM-32]**	Pilot PSP - backend	Pilot PSP - distribution component	The Pilot PSP - backend performs the funding commercial bank money checks **[sLM-32].**
LM-1.8.15	**Forwards request rejection**	Pilot PSP - distribution component	App	The Pilot PSP - distribution component forwards the request rejection and the rejection reason to the app.
LM-1.8.16	**Sends offline funding instruction**	Pilot PSP - distribution component	DESP	The Pilot PSP - distribution component sends funding instruction to DESP.

LM-1.8.17	**Settlement funding offline [sTM-58]**	DESP	Pilot PSP - distribution component	The DESP performs settlement funding offline [**sTM-58**].
LM-1.8.18	**Forwards settlement rejection**	Pilot PSP - distribution component	Pilot PSP - backend and/or App	The Pilot PSP - distribution component is notified about the offline settlement funding rejection and forwards the rejection with the rejection reason to the app and to the Pilot PSP - backend.
LM-1.8.19	**Unlocks funds on commercial bank money account**	Pilot PSP - backend	N/A	**Optional -** The Pilot PSP - backend receives the notification about the settlement rejection and releases the blocked funds in the Individual End-User's commercial bank money account.
LM-1.8.20	**Displays rejection**	App	Individual End-User	The Individual End-User's app displays a rejection message with the rejection reason to the Individual End-User.
LM-1.8.21	**Rejection notified**	Individual End-User	N/A	The Individual End-User is informed of the rejection and the rejection reason.
LM-1.8.22	**Forwards offline funding confirmation**	Pilot PSP - distribution component	Offline secure application and/or PSP - backend	The Pilot PSP - distribution component is notified about the funding confirmation and forwards the funding confirmation to Pilot PSP - backend and offline secure application.
LM-1.8.23	**Increases offline balance**	Offline secure application	App	The offline secure application receives the funding confirmation and increases the Individual End-User's offline balance with the same amount and delivers this information to the Individual End-User' app.
LM-1.8.24	**Displays funding confirmation**	App	Individual End-User	The Individual End-User's app displays funding confirmation to the Individual End-User.
LM-1.8.25	**Funding completed**	Individual End-User	N/A	The Individual End-User receives the confirmation and the funds.
LM-1.8.26	**Debits commercial bank money account**	Pilot PSP - backend	N/A	The Pilot PSP - backend replaces the amount reservation on the Individual End-User's commercial bank money account by a debit posting (if the amount was initially blocked instead of debited, this is up to the Pilot PSP).
LM-1.8.27	**Register the operation for AML/CFT monitoring**	Pilot PSP - backend	N/A	The Pilot PSP - backend registers the funding operation for AML/CFT monitoring purposes.

2.1.3 Offline Beta Digital Euro manual funding from Beta Digital Euro payment account via app

The steps characterising offline manual funding from own Beta Digital Euro payment account via app (either Eurosystem-provided app or proprietary Pilot PSP app) are presented and depicted in the following flow:

Assumption: the app requires an online connection. The offline wallet is installed on the End-User's mobile device.



LM-1.9 Offline Beta Digital Euro manual funding from Beta Digital Euro payment account via app

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
LM-1.9.01	**Opens app**	Individual End-User	App	The Individual End-User opens app.
LM-1.9.02	**Authentication [sAM-17.1]**	App	Individual End-User	The Individual End-User' app initiates authentication **[sAM-17.1]**.

LM-1.9.03	**Selects "offline funding option" and specifies amount and funding source**	Individual End-User	App	The Individual End-User selects the “offline account funding option”, specifies the amount and select the Beta Digital Euro payment account as funding source owned. *Precondition: the Individual End-User’s device must be connected to the internet.*
LM-1.9.04	**Sends funding data**	App	Offline secure application	The app sends the funding data to the offline secure application.
LM-1.9.05	**Online integrity check and transaction counter reset [sTM-14]**	Offline secure application	App	The offline secure application performs online integrity check and transaction counter reset **[sTM-14]**.
LM-1.9.06	**Submits funding request**	App	Offline secure application	The Individual End-User’s app submits a funding request for the funding amount specified by the Individual End-User to the offline secure application.
LM-1.9.07	**Checks and calculates offline balance**	Offline secure application	N/A	The offline secure application checks and calculates the new offline balance to check if it exceeds the holding limit.
LM-1.9.08	**Exceeds holding limit?**	Offline secure application	N/A	If the new calculated offline balance exceeds the holding limit, the offline secure application rejects the funding request.
LM-1.9.09	**Sends funding request**	Offline secure application	Pilot PSP - distribution component	The offline secure application sends the funding request to the Pilot PSP – distribution component.
LM-1.9.10	**Sends rejection**	Offline secure application	App	The offline secure rejects the request and sends a rejection message specifying the error type to the app.
LM-1.9.11	**Displays rejection**	App	Individual End-User	The Individual End-User’s app displays a rejection message with the rejection reason to the Individual End-User.
LM-1.9.12	**Rejection notified**	Individual End-User	N/A	The Individual End-User is informed of the rejection and the rejection reason.
LM-1.9.13	**Forwards funding request**	Pilot PSP - distribution component	Pilot PSP - backend	The Pilot PSP - distribution component forwards the funding request to the Pilot PSP - backend.
LM-1.9.14	**Defunding checks [sLM-35]**	Pilot PSP - backend	N/A and/or Pilot PSP - distribution component	The Pilot PSP - backend performs the defunding checks **[sLM-35].**
LM-1.9.15	**Forwards request rejection**	Pilot PSP - distribution component	App	The Pilot PSP - distribution component forwards the request rejection with the rejection reason to the app.

LM-1.9.16	**Sends online defunding instruction**	Pilot PSP - backend	DESP	The Pilot PSP - backend sends online defunding instruction to DESP. *Step-specific business rules: LM-021-001*
LM-1.9.17	**Settlement defunding online [sTM-57]**	DESP	Pilot PSP - backend	The DESP performs settlement defunding online **[sTM-57]**
LM-1.9.18	**Increases online balance**	Pilot PSP - backend	Pilot PSP - distribution component	In case of rejection, the Pilot PSP - backend increases back the online balance of the Beta Digital Euro payment account. The Pilot PSP - backend forwards the rejection message specifying the error type to the Pilot PSP - distribution component.
LM-1.9.19	**Forwards settlement rejection**	Pilot PSP - distribution component	App	The Pilot PSP - distribution component forwards the settlement rejection with the rejection reason to the Individual End-User's app.
LM-1.9.20	**Displays rejection**	App	Individual End-User	The Individual End-User's app displays a rejection message with the rejection reason to the Individual End-User.
LM-1.9.21	**Rejection notified**	Individual End-User	N/A	The Individual End-User is informed of the rejection and the rejection reason.
LM-1.9.22	**Receives settlement online defunding confirmation**	Pilot PSP - backend	Pilot PSP - distribution component	The Pilot PSP - backend receives settlement defunding confirmation from DESP and informs the Pilot PSP-distribution component.
LM-1.9.23	**Sends offline funding instruction**	Pilot PSP - distribution component	DESP	The Pilot PSP - distribution component receives settlement defunding confirmation and sends offline funding instruction to the DESP. *Step-specific business rules: LM-021-001*
LM-1.9.24	**Settlement funding offline [sTM-58]**	DESP	Pilot PSP - distribution component and/or N/A	The DESP performs offline funding settlement **[sTM-58].** *Note: In case of failure of the process, a procedure to re-issue online amount previously redeemed should be put in place.*
LM-1.9.25	**Settlement funding online [sTM-56]**	DESP	Pilot PSP - backend	The DESP performs settlement funding online **[sTM-56].**
LM-1.9.26	**Forwards offline funding confirmation**	Pilot PSP - distribution component	Offline secure application and/or Pilot PSP - backend	The Pilot PSP - distribution component is notified about the funding confirmation and forwards the funding confirmation to Pilot PSP - backend and offline secure application.
LM-1.9.27	**Increases offline balance**	Offline secure application	App	The offline secure application receives the funding confirmation and increases the Individual End-User's offline balance with the same amount and delivers this

				information to the Individual End-User' app.
LM-1.9.28	**Displays funding confirmation**	App	Individual End-User	The Individual End-User's app displays funding confirmation to the Individual End-User.
LM-1.9.29	**Funding completed**	Individual End-User	N/A	The Individual End-User receives the confirmation and the funds.
LM-1.9.29	**Register the operation for AML/CFT monitoring**	Pilot PSP - backend	N/A	The Pilot PSP - backend receives the funding confirmation and registers the funding operation for AML/CFT monitoring purposes.

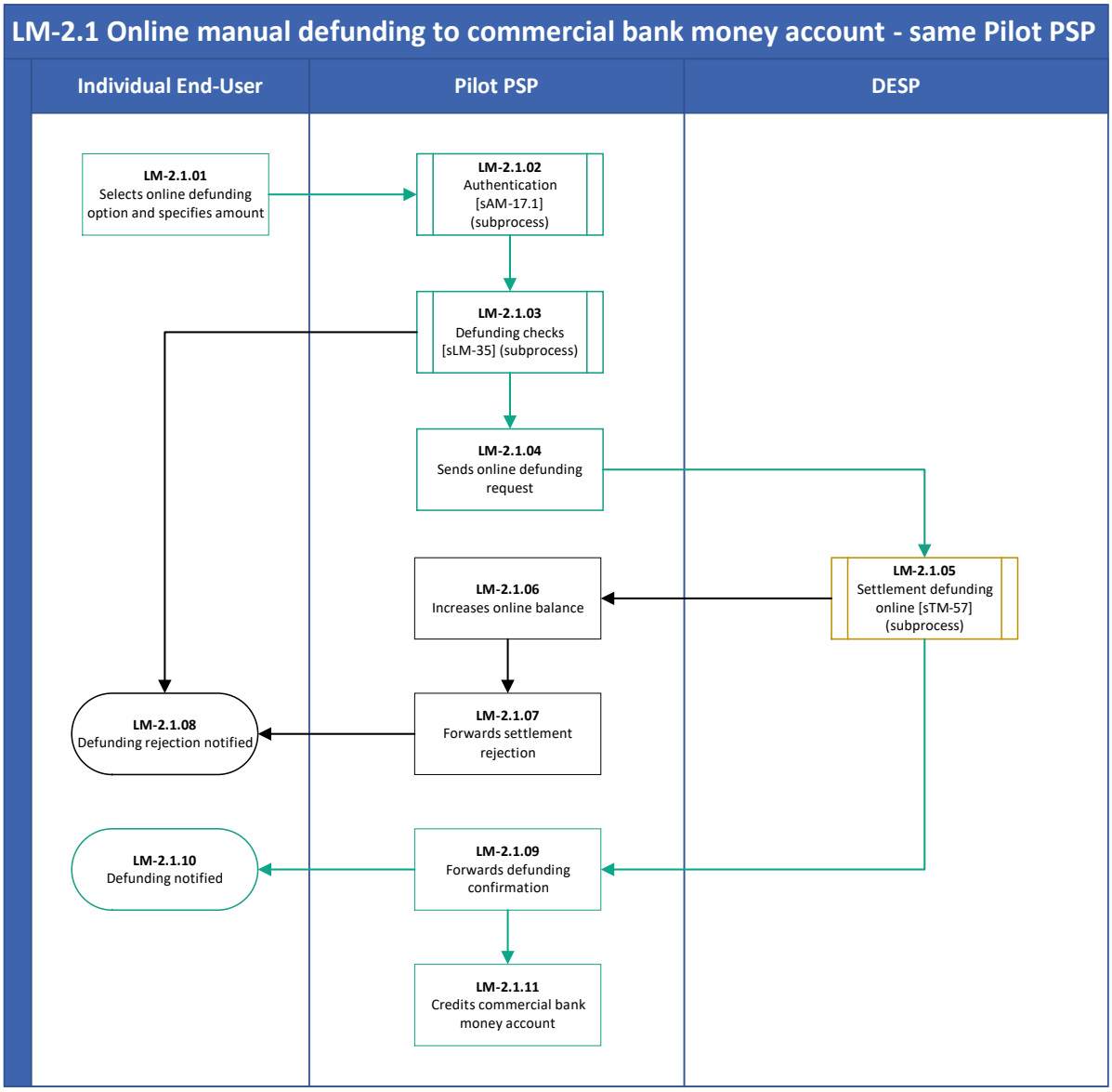
2.2 Defunding

General business rules that refer to the defunding flows: LM-040-001.

Pilot PSPs have the obligation to establish processes to help individuals defund their Beta Digital Euro payment accounts. Defunding can be done to a commercial bank money account.

2.2.1 Online manual defunding to commercial bank money account - same Pilot PSP

Individuals can defund their Beta Digital Euro payment account to their commercial bank money account via the mobile app (either Eurosystem-provided app or proprietary Pilot PSP app). The following flow presents and depicts the steps characterising the process of manual defunding from a Beta Digital Euro payment account to a commercial bank money account offered by the same Pilot PSP.



LM-2.1 Online manual defunding to commercial bank money account - same Pilot PSP

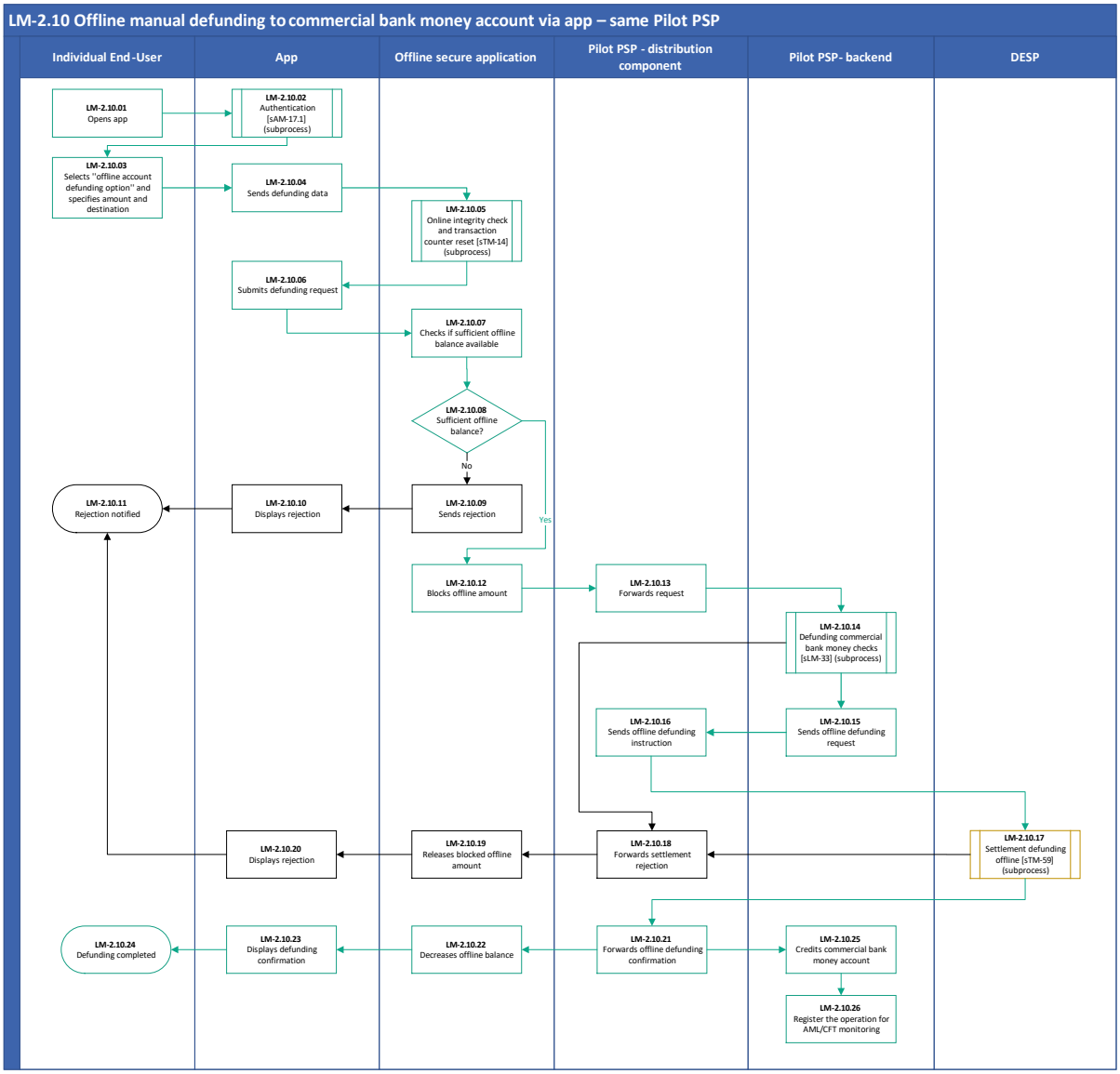
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
LM-2.1.01	**Selects online defunding option and specifies amount**	Individual End-User	Pilot PSP	The Individual End-User opens the app (if required), selects the online defunding option from the menu, specifies the amount to be defunded as well as the destination commercial bank money account. If the Individual End-User has linked an account, this account should be the default destination account.
LM-2.1.02	**Authentication [sAM-17.1]**	Pilot PSP	N/A	The Pilot PSP initiates the **authentication [sAM-17.1].**
LM-2.1.03	**Defunding checks [sLM-35]**	Pilot PSP	Individual End-User and/or N/A	The Pilot PSP performs the defunding checks **[sLM-35].**

LM-2.1.04	**Sends online defunding request**	Pilot PSP	DESP	The Individual End-User's Pilot PSP sends a defunding request to DESP.
LM-2.1.05	**Settlement defunding online [sTM-57]**	DESP	Pilot PSP	The DESP initiates the settlement defunding online **[sTM-57].**
LM-2.1.06	**Increases online balance**	Pilot PSP	N/A	If the settlement fails, the Pilot PSP increases back the online balance of the Individual End-User's account.
LM-2.1.07	**Forwards settlement rejection**	Pilot PSP	Individual End-User	The Pilot PSP forwards the settlement rejection and the rejection reason to the Individual End-User.
LM-2.1.08	**Defunding rejection notified**	Individual End-User	N/A	Individual End-User is notified of the rejection and the rejection reason.
LM-2.1.09	**Forwards defunding confirmation**	Pilot PSP	Individual End-User and/or N/A	The Pilot PSP forwards the confirmation to the Individual End-User that defunding is processed and completed.
LM-2.1.10	**Defunding notified**	Individual End-User	N/A	The Individual End-User is informed that the defunding operation has been completed successfully.
LM-2.1.11	**Credits commercial bank money account**	Pilot PSP	N/A	The Pilot PSP credits the Individual End-User's commercial bank money account for the defunding amount. *Step-specific business rules: LM-040-003*

2.2.2 Offline manual defunding to commercial bank money account via app – same Pilot PSP

The following flow presents and depicts the steps characterising the process of offline manual defunding at same Pilot PSP via app (either Eurosystem-provided app or proprietary Pilot PSP app) to a commercial bank money account.

Assumption: the app requires an online connection. The offline wallet is installed on the Individual End-User's mobile device.



LM-2.10 Offline manual defunding to commercial bank money account via app - same Pilot PSP

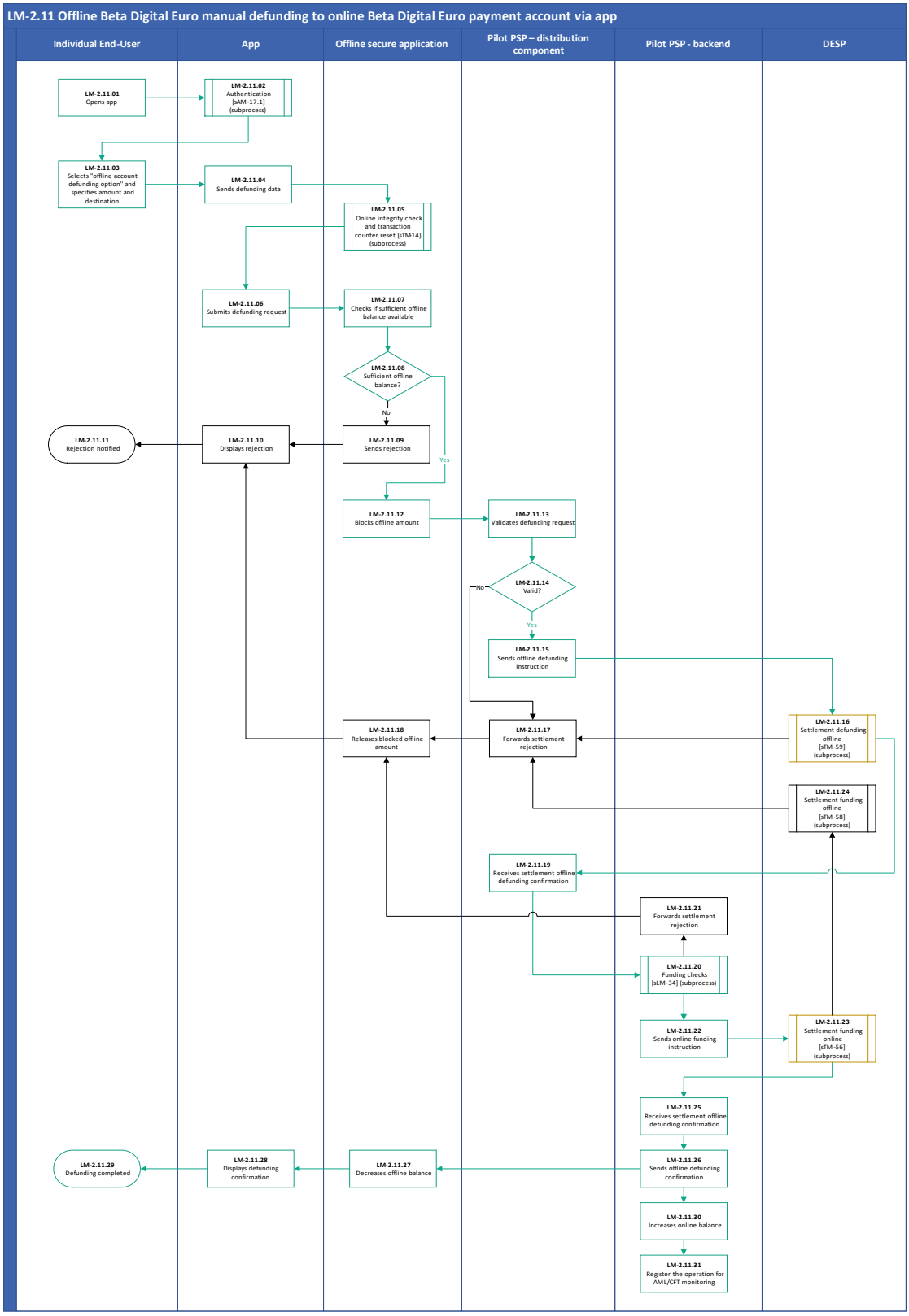
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
LM-2.10.01	**Opens app**	Individual End-User	App	The Individual End-User opens the app.
LM-2.10.02	**Authentication [sAM-17.1]**	App	Individual End-User	The app triggers the authentication sub process **[sAM17.1]**.
LM-2.10.03	**Selects "offline account defunding option" and specifies amount and destination**	Individual End-User	App	The Individual End-User selects the “offline account defunding option”, specifies the amount as well as the destination commercial bank money account. If the Individual End-User has linked an account, this account should be the default destination account.

				Precondition: the Individual End-User's device must be connected to the internet.
LM-2.10.04	**Sends defunding data**	App	Offline secure application	The app sends the defunding data to the offline secure application.
LM-2.10.05	**Online integrity check and transaction counter reset [sTM-14]**	Offline secure application	App	The offline secure application performs online integrity check and transaction counter reset **[sTM-14]**.
LM-2.10.06	**Submits defunding request**	App	Offline secure application	The app submits the defunding request for the defunding amount to the offline secure application.
LM-2.10.07	**Checks if sufficient offline balance available**	Offline secure application	N/A	The offline secure application checks if sufficient offline balance is available to perform the requested defunding.
LM-2.10.08	**Sufficient offline balance?**	Offline secure application	N/A	If the offline balance is insufficient the defunding operation is not executed, and the app is notified.
LM-2.10.09	**Sends rejection**	Offline secure application	App	The offline secure application rejects the request and sends a rejection message specifying the error type to the app.
LM-2.10.10	**Displays rejection**	App	Individual End-User	The app displays a rejection with the rejection reason to the Individual End-User.
LM-2.10.11	**Rejection notified**	Individual End-User	N/A	The Individual End-User is informed that the offline balance is insufficient to perform the defunding. The Individual End-User can retry selecting a lower amount.
LM-2.10.12	**Blocks offline amount**	Offline secure application	Pilot PSP - distribution component	If the offline balance is sufficient, the offline secure application blocks the offline amount and sends the offline defunding request to the Pilot PSP - distribution component.
LM-2.10.13	**Forwards request**	Pilot PSP - distribution component	Pilot PSP - backend	The Pilot PSP - distribution component forwards the defunding request to the Pilot PSP - backend.
LM-2.10.14	**Defunding commercial bank money checks [sLM-33]**	Pilot PSP - backend	Pilot PSP - distribution component and/or N/A	The Pilot PSP - backend performs the defunding commercial bank money checks **[sLM-33].**
LM-2.10.15	**Sends offline defunding request**	Pilot PSP - backend	Pilot PSP - distribution component	The Pilot PSP - backend send to the Pilot PSP - distribution component the funding request previously validated.
LM-2.10.16	**Sends offline defunding instruction**	Pilot PSP - distribution component	DESP	The Pilot PSP - distribution component sends funding instruction to DESP.
LM-2.10.17	**Settlement defunding offline [sTM-59]**	DESP	Pilot PSP - distribution component	The DESP performs settlement defunding offline **[sTM-59]**.

LM-2.10.18	**Forwards settlement rejection**	Pilot PSP - distribution component	Offline secure application	If the settlement defunding process is unsuccessful, the Pilot PSP - distribution component forwards the settlement rejection with the rejection reason to the offline secure application.
LM-2.10.19	**Releases blocked offline amount**	Offline secure application	App	The offline secure application receives the settlement rejection and releases the offline amount that was previously blocked.
LM-2.10.20	**Displays rejection**	App	Individual End-User	The app displays a rejection with the rejection reason to the Individual End-User.
LM-2.10.21	**Forwards offline defunding confirmation**	Pilot PSP - distribution component	Offline secure application and/or Pilot PSP - backend	If the settlement defunding process is successful, the Pilot PSP - distribution component sends a confirmation to the Pilot PSP - backend and the offline secure application.
LM-2.10.22	**Decreases offline balance**	Offline secure application	App	The offline secure application receives the defunding confirmation and decreases the offline balance with the defunded amount.
LM-2.10.23	**Displays defunding confirmation**	App	Individual End-User	The app displays a defunding confirmation to the Individual End-User.
LM-2.10.24	**Defunding completed**	Individual End-User	N/A	The Individual End-User is informed that the defunding is completed.
LM-2.10.25	**Credits commercial bank money account**	Pilot PSP - backend	N/A	Once the defunding confirmation is received, the Pilot PSP - backend credits the Individual End-User's commercial bank money account with the defunding amount. *Step-specific business rules: LM-040-003*
LM-2.10.26	**Register the operation for AML/CFT monitoring**	Pilot PSP - backend	N/A	The Pilot PSP - backend registers the operation for monitoring purposes.

2.2.3 Offline Beta Digital Euro manual defunding to Beta Digital Euro payment account via app

The following flow presents and depicts the steps characterising the process of manual defunding of offline holding to own Beta Digital Euro payment account via app (either Eurosystem-provided app or proprietary Pilot PSP app). *Assumption: the app requires an online connection. The offline wallet is installed on the Individual End-User's mobile device.*



LM-2.11 Offline Beta Digital Euro manual defunding to Beta Digital Euro payment account via app

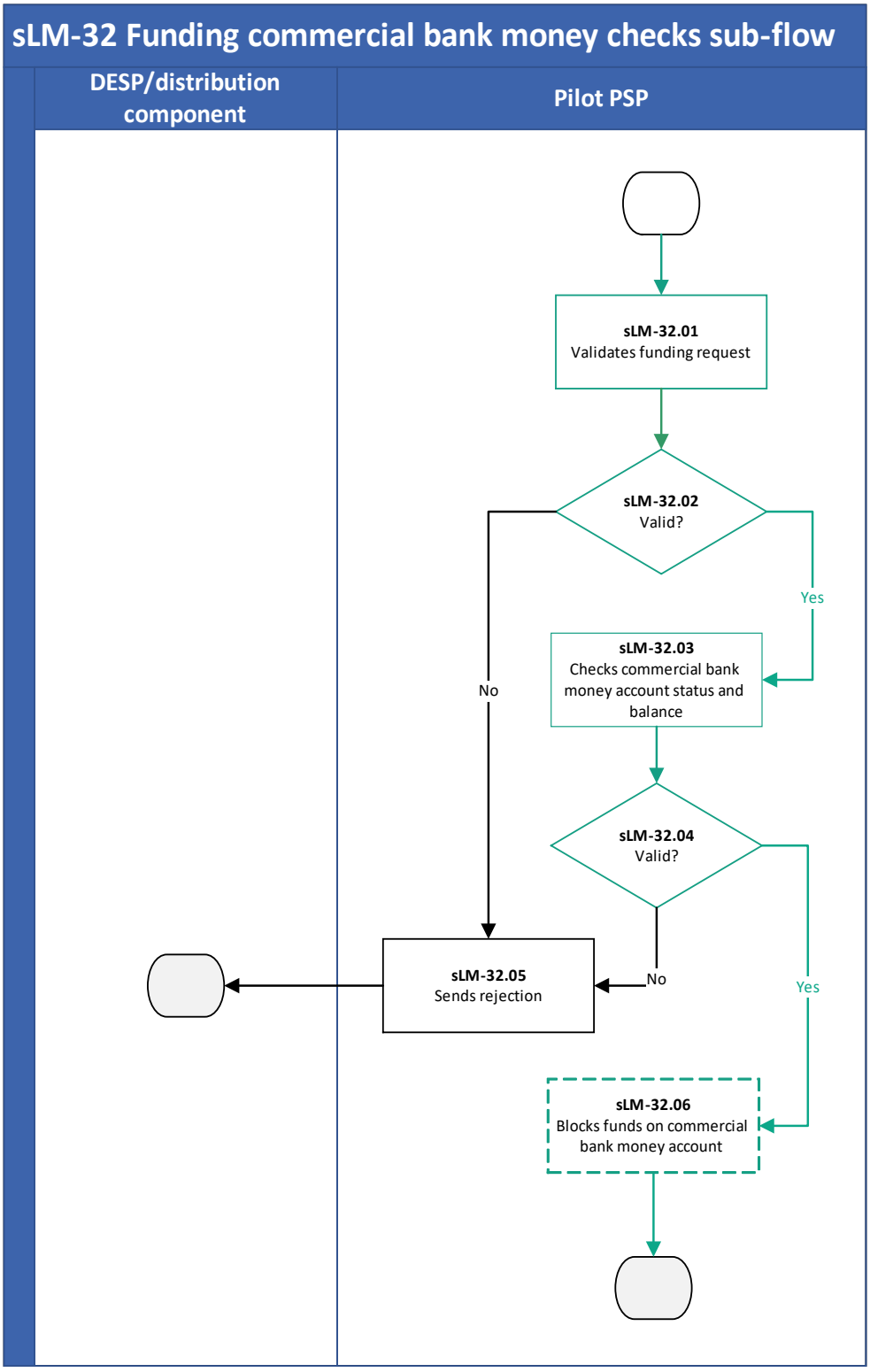
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
LM-2.11.01	**Opens app**	Individual End-User	App	The Individual End-User opens the app.
LM-2.11.02	**Authentication [sAM-17.1]**	App	Individual End-User	The app initiates the authentication **[sAM-17.1].**
LM-2.11.03	**Selects "offline account defunding option" and specifies amount and destination**	Individual End-User	App	The Individual End-User selects the “offline account defunding option”, specifies the amount and selects his Beta Digital Euro payment account as defunding target. *Precondition: the Individual End-User’s device must be connected to the internet.*
LM-2.11.04	**Sends defunding data**	App	Offline secure application	The app sends the defunding data to the offline secure application.
LM-2.11.05	**Online integrity check and transaction counter reset [sTM-14]**	Offline secure application	App	The offline secure application performs online integrity check and transaction counter reset **[sTM-14].**
LM-2.11.06	**Submits defunding request**	App	Offline secure application	The app submits the defunding request for the defunding amount to the offline secure application.
LM-2.11.07	**Checks if sufficient offline balance available**	Offline secure application	N/A	The offline secure application checks if the offline balance of the Individual End-User’s is sufficient to defund the requested amount.
LM-2.11.08	**Sufficient offline balance?**	Offline secure application	N/A	If the offline balance is insufficient the defunding operation is not executed, and the app is notified.
LM-2.11.09	**Sends rejection**	Offline secure application	App	The offline secure application rejects the request and sends a rejection message specifying the error type to the app.
LM-2.11.10	**Displays rejection**	App	Individual End-User	The app displays the rejection notification with the rejection reason to the Individual End-User.
LM-2.11.11	**Rejection notified**	Individual End-User	N/A	The Individual End-User is informed that the offline balance is insufficient to perform the defunding. Individual End-User can retry selecting a lower amount.
LM-2.11.12	**Blocks offline amount**	Offline secure application	Pilot PSP – distribution component	If the offline balance is sufficient, the offline secure application blocks the offline amount and sends the offline defunding request to the Pilot PSP - distribution component.
LM-2.11.13	**Validates defunding request**	Pilot PSP – distribution component	N/A	The Pilot PSP - distribution component validates the defunding request.
LM-2.11.14	**Valid?**	Pilot PSP – distribution component	N/A	If the request is not valid, the Pilot PSP - distribution component will reject the request. *Note: Validation may be executed on the request's format or its content from a technical*

				and functional perspective in accordance with established business rules.
LM-2.11.15	**Sends offline defunding instruction**	Pilot PSP – distribution component	DESP	The Pilot PSP - distribution component sends the offline defunding instruction to the DESP. *Step-specific business rules: LM-041-001*
LM-2.11.16	**Settlement defunding offline [sTM-59]**	DESP	Pilot PSP – distribution component	The DESP performs settlement defunding offline **[sTM-59].**
LM-2.11.17	**Forwards settlement rejection**	Pilot PSP – distribution component	Offline secure application	If the settlement defunding process is unsuccessful, the Pilot PSP - distribution component forwards the settlement rejection with the rejection reason to the offline secure application.
LM-2.11.18	**Releases blocked offline amount**	Offline secure application	App	The offline secure application receives the settlement rejection and releases the offline amount that was previously blocked.
LM-2.11.19	**Receives settlement offline defunding confirmation**	Pilot PSP – distribution component	Pilot PSP - backend	The Pilot PSP - distribution component receives settlement defunding confirmation and informs the Pilot PSP - backend.
LM-2.11.20	**Funding checks [sLM-34]**	Pilot PSP - backend	N/A	The Pilot PSP - backend performs the funding checks **[sLM-34].**
LM-2.11.21	**Forwards settlement rejection**	Pilot PSP - backend	Offline secure application	If the settlement funding process is unsuccessful, the Pilot PSP - backend forwards the settlement rejection with the rejection reason to the Individual End-User's app.
LM-2.11.22	**Sends online funding instruction**	Pilot PSP - backend	DESP	The Pilot PSP - backend sends the online funding instruction to the DESP.
LM-2.11.23	**Settlement funding online [sTM-56]**	DESP	N/A and/or Pilot PSP - backend	The DESP initiates the settlement funding online **[sTM-56].** *Note: In case of failure of the process, a procedure to re-issue offline amount previously redeemed should be put in place.*
LM-2.11.24	**Settlement funding offline [sTM-58]**	DESP	Pilot PSP – distribution component	The DESP performs offline funding settlement **[sTM-58].**
LM-2.11.25	**Receives settlement offline defunding confirmation**	Pilot PSP - backend	N/A	The Pilot PSP - backend receives settlement defunding confirmation.
LM-2.11.26	**Sends offline defunding confirmation**	Pilot PSP - backend	Offline secure application and/or N/A	The Pilot PSP - backend sends the confirmation to the offline secure application that the defunding instruction has been executed successfully.
LM-2.11.27	**Decreases offline balance**	Offline secure application	App	The offline secure application receives the defunding confirmation and decreases the offline balance with the defunded amount. *Step-specific business rules: TM-000-006*

LM-2.11.28	**Displays defunding confirmation**	App	Individual End-User	The app displays the confirmation notification to the Individual End-User that defunding is processed and completed.
LM-2.11.29	**Defunding completed**	Individual End-User	N/A	The Individual End-User is informed that the defunding operation has been completed successfully.
LM-2.11.30	**Increases online balance**	Pilot PSP - backend	N/A	Once the defunding confirmation is received, the Pilot PSP - backend increases the online balance of the Individual End-User's account.
LM-2.11.31	**Register the operation for AML/CFT monitoring**	Pilot PSP - backend	N/A	The Pilot PSP - backend registers the defunding operation for AML/CFT monitoring purposes.

2.3 Liquidity management sub-flows

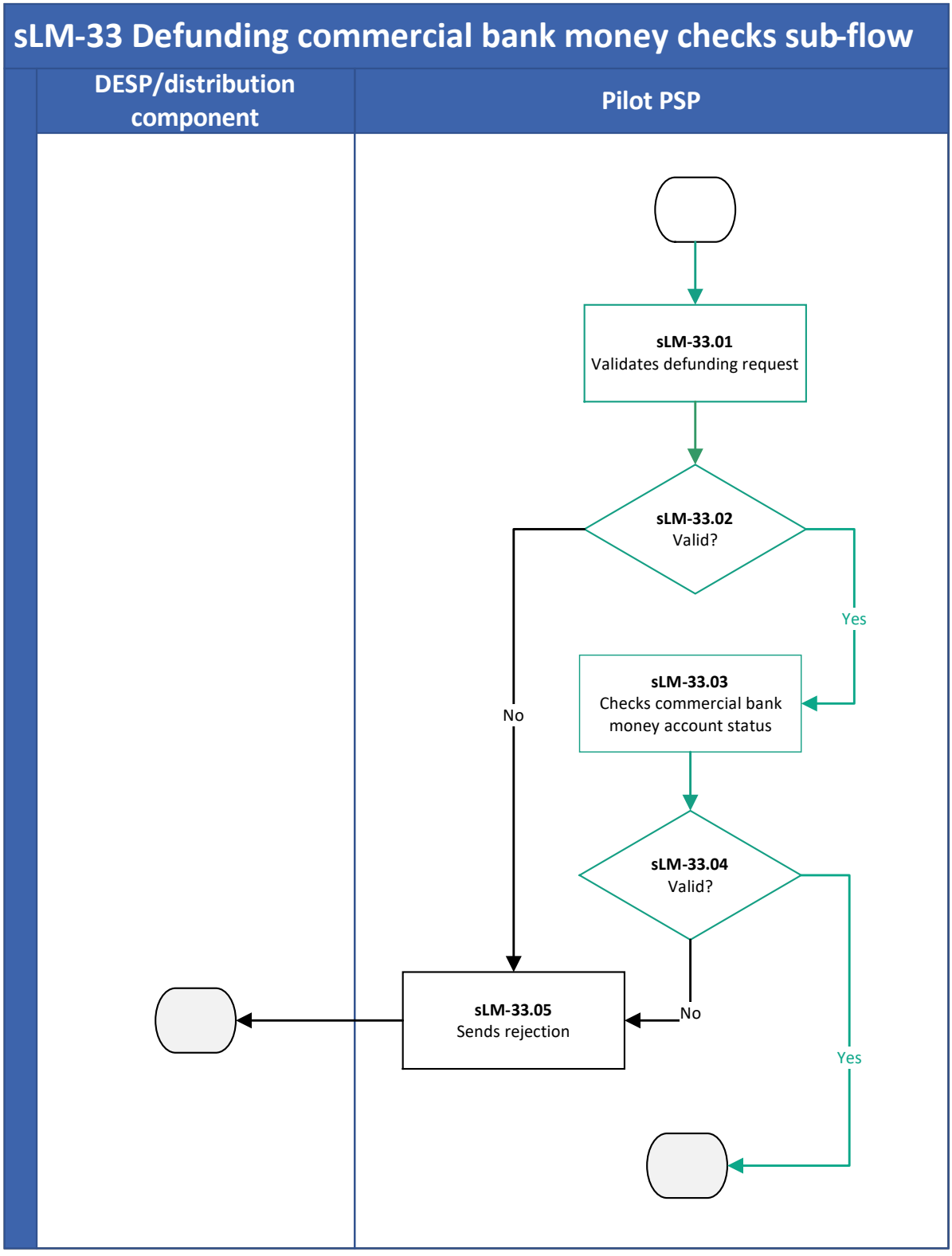
2.3.1 Funding commercial bank money checks



sLM-32 Funding commercial bank money checks sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sLM-32.01	**Validates funding request**	Pilot PSP	N/A	The Pilot PSP validates the funding request.
sLM-32.02	**Valid?**	Pilot PSP	N/A	If the request is not valid, the Pilot PSP will reject the request. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
sLM-32.03	**Checks commercial bank money account status and balance**	Pilot PSP	N/A	The Individual End-User's Pilot PSP checks the status of the commercial bank money account and if its balance is sufficient to fund the Beta Digital Euro payment account as requested.
sLM-32.04	**Valid?**	Pilot PSP	N/A	If the commercial bank money account is inactive and/or its balance is insufficient, the funding operation is not executed.
sLM-32.05	**Sends rejection**	Pilot PSP	DESP/distribution component	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Eurosystem - Access Gateway Service (for online funding) or to the distribution component (for offline funding).
sLM-32.06	**Blocks funds on commercial bank money account**	Pilot PSP	N/A	Optional - If the balance is sufficient, the Pilot PSP blocks the funds on the designated commercial bank money account.

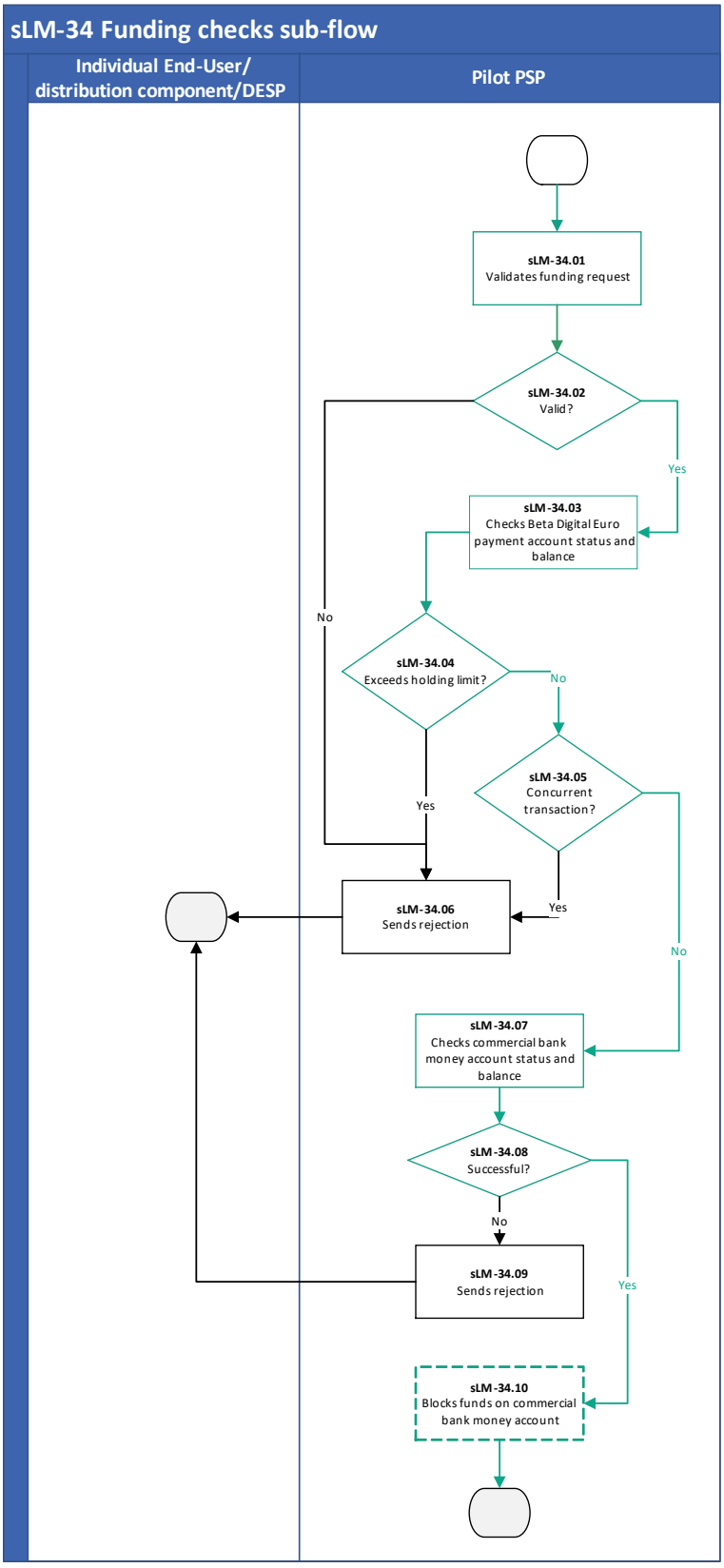
2.3.2 Defunding commercial bank money checks



sLM-33 Defunding commercial bank money checks sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sLM-33.01	**Validates defunding request**	Pilot PSP	N/A	The Pilot PSP validates the defunding request.
sLM-33.02	**Valid?**	Pilot PSP	N/A	If the request is not valid, the Pilot PSP will reject the request. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
sLM-33.03	**Checks commercial bank money account status**	Pilot PSP	N/A	The Individual End-User's Pilot PSP checks the status of the commercial bank money account.
sLM-33.04	**Valid?**	Pilot PSP	N/A	If the commercial bank money account is inactive, the defunding operation is not executed.
sLM-33.05	**Sends rejection**	Pilot PSP	DESP/distribution component	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the Eurosystem - Access Gateway Service (for online defunding) or to the distribution component (for offline defunding).

2.3.3 Funding checks

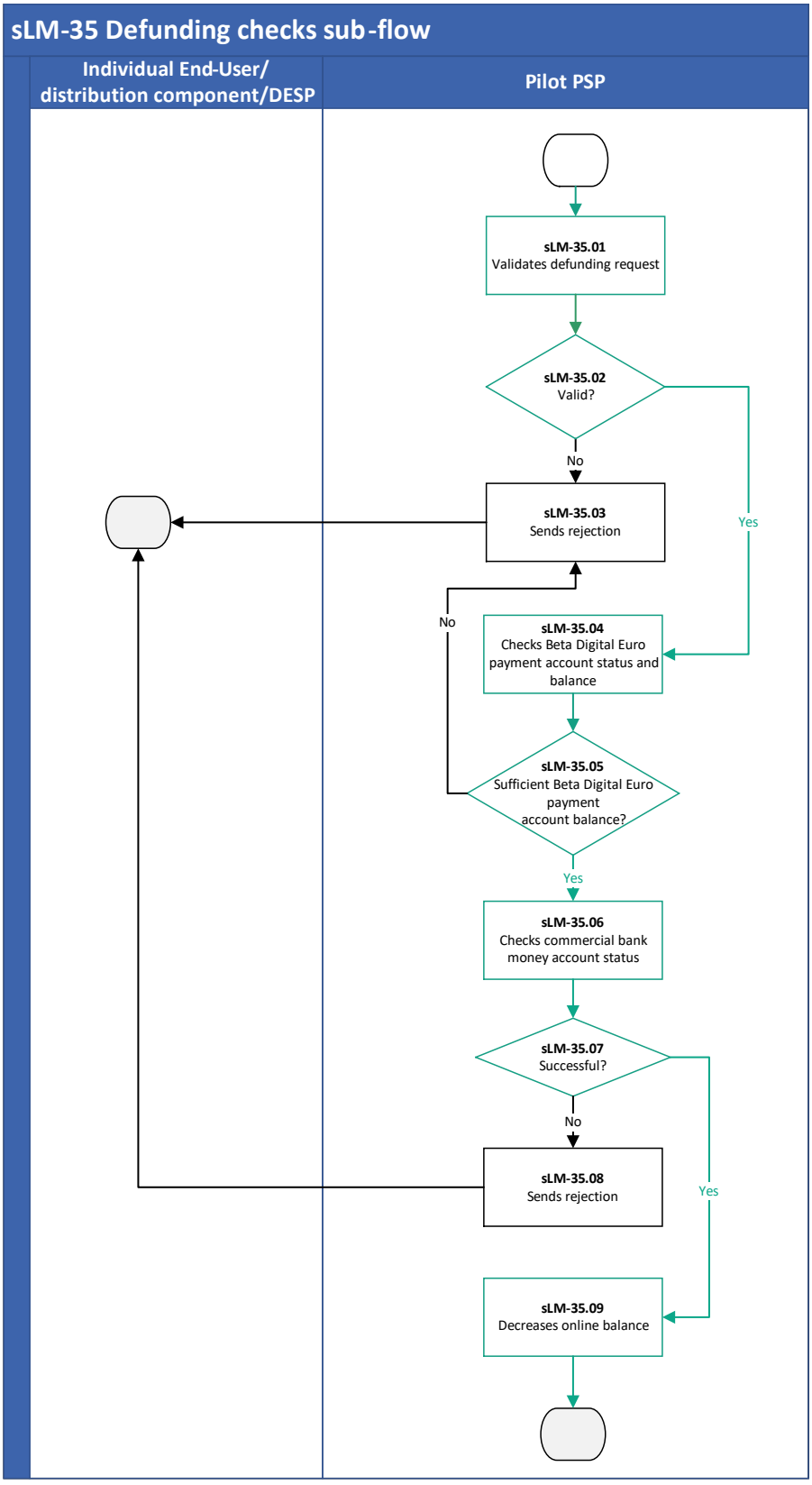


sLM-34 Funding checks sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sLM-34.01	**Validates funding request**	Pilot PSP	N/A	The Pilot PSP validates the funding request.
sLM-34.02	**Valid?**	Pilot PSP	N/A	If the request is not valid, the Pilot PSP will reject the request. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
sLM-34.03	**Checks Beta Digital Euro payment account status and balance**	Pilot PSP	N/A	The Pilot PSP checks if the Individual End-User has sufficient funds to complete the transaction and if the status of the Individual End-User's Beta Digital Euro payment account is valid. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002*
sLM-34.04	**Exceeds holding limit?**	Pilot PSP	N/A	The Pilot PSP checks if the funding amount exceeds or not the Individual End-User's holding limit. Assumption: if the funding request would result in the Individual End-User's balance exceeding the holding limit, the funding request is rejected (and the Individual End-User can try again for a lower amount), not partially executed. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002*
sLM-34.05	**Concurrent transaction?**	Pilot PSP	N/A	The Pilot PSP checks if another incoming Beta Digital Euro transaction is still being processed (not settled or rejected).
sLM-34.06	**Sends rejection**	Pilot PSP	Individual End-User/ distribution component/DESP	If the requested funding amount exceeds the holding limit or if another incoming Beta Digital Euro transaction is still being processed, the Pilot PSP rejects the funding request and sends the rejection to the Individual End-User, for online (de)funding, or to distribution component for offline (de)funding. Eventually for online (de)funding, the Pilot PSP sends the rejection also to the Eurosystem - Access Gateway Service in case another Pilot PSP is to be informed.
sLM-34.07	**Checks commercial bank money account status and balance**	Pilot PSP	N/A	The Individual End-User's Pilot PSP checks the status of the Individual End-User commercial bank money account and if its balance is sufficient to fund the Beta Digital Euro payment account as requested.
sLM-34.08	**Successful?**	Pilot PSP	N/A	If the commercial bank money account is inactive and/or its balance is insufficient the funding operation is not executed.
sLM-34.09	**Sends rejection**	Pilot PSP	Individual End-User/	The Pilot PSP rejects the funding and sends a rejection message specifying the error type to the

			distribution component/DESP	Individual End-User.
sLM-34.10	**Blocks funds on commercial bank money account**	Pilot PSP	N/A	Optional - The Individual End-User's Pilot PSP blocks the required funds on the Individual End-User's commercial bank money account.

2.3.4 Defunding checks

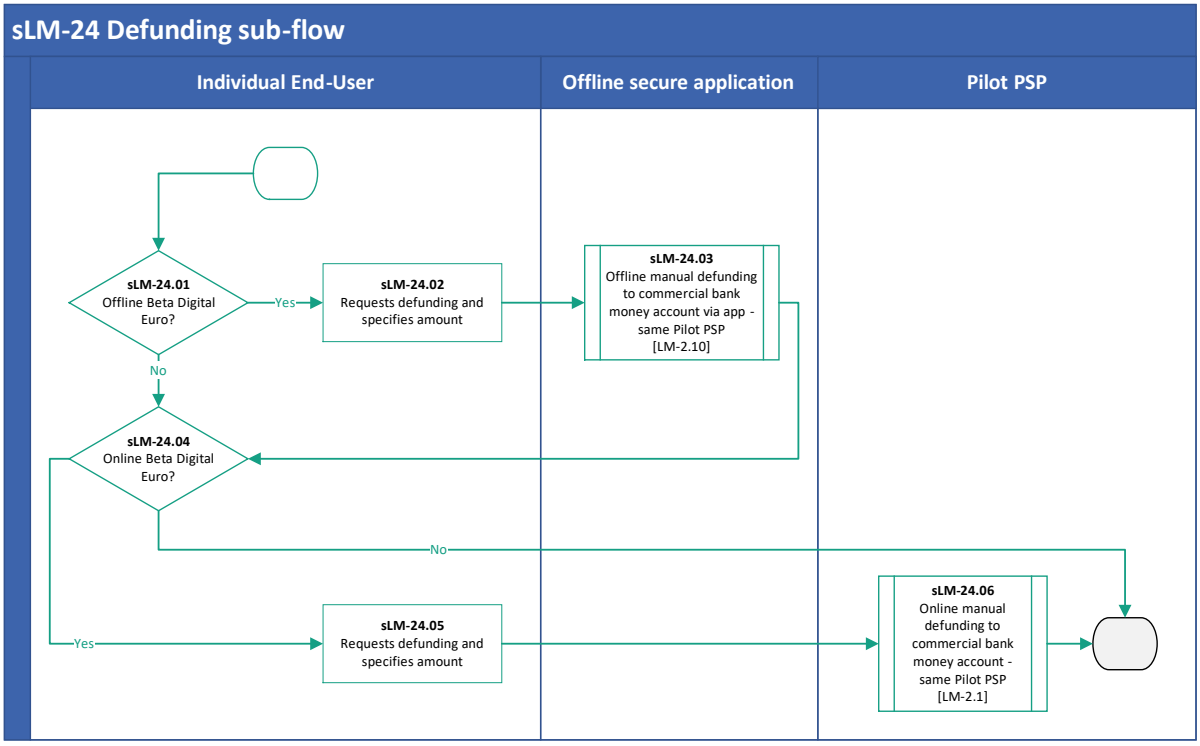


sLM-35 Defunding checks sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sLM-35.01	**Validates defunding request**	Pilot PSP	N/A	The Pilot PSP validates the defunding request.
sLM-35.02	**Valid?**	Pilot PSP	N/A	If the request is not valid, the Pilot PSP will reject the request. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
sLM-35.03	**Sends rejection**	Pilot PSP	Individual End-User/ distribution component/ DESP	If the requested funding amount exceeds the holding limit or if another incoming Beta Digital Euro transaction is still being processed, the Pilot PSP rejects the funding request and sends the rejection to the Individual End-User, for online (de)funding, or to distribution component for offline (de)funding. Eventually for online (de)funding, the Pilot PSP sends the rejection also to the Eurosystem - Access Gateway Service in case another Pilot PSP is to be informed.
sLM-35.04	**Checks** Beta Digital Euro payment account **status and balance**	Pilot PSP	N/A	The Pilot PSP checks if the Individual End-User has sufficient funds to complete the transaction and if the status of the Individual End-User's Beta Digital Euro payment account is valid. *Step-specific business rules: TM-000-007*
sLM-35.05	**Sufficient Beta Digital Euro payment account balance?**	Pilot PSP	N/A	If the Beta Digital Euro payment account balance is insufficient the defunding operation is not executed, and the Individual End-User is notified.
sLM-35.06	**Checks commercial bank money account status**	Pilot PSP	N/A	The Individual End-User's Pilot PSP checks the status of the Individual End-User commercial bank money account and if its balance is sufficient to fund the Beta Digital Euro payment account as requested.
sLM-35.07	**Successful?**	Pilot PSP	N/A	If the commercial bank money account is inactive and/or its balance is insufficient the funding operation is not executed.
sLM-35.08	**Sends rejection**	Pilot PSP	Individual End-User/ distribution component/ DESP	The Pilot PSP rejects the funding and sends a rejection message specifying the error type to the Individual End-User.

sLM-35.09	**Decreases online balance**	Pilot PSP	N/A	The Pilot PSP decreases the online balance of the Individual End-User's account.

2.3.5 Defunding



sLM-24 Defunding sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sLM-24.01	**Offline Beta Digital Euro?**	Individual End-User	N/A	If the Individual End-User holds offline holdings, these can be defunded via app.
sLM-24.02	**Requests defunding and specifies amount**	Individual End-User	Offline secure application	The Individual End-User requests the defunding of the offline wallet to a commercial bank money account via app.
sLM-24.03	**Offline manual defunding to commercial bank money account via app - same Pilot PSP [LM-2.10]**	Offline secure application	Individual End-User	In case the Individual End-User aims at defunding the offline wallet to a commercial bank money account via app, the steps of flow **LM-2.10** are executed (starting from fourth step).
sLM-24.04	**Online Beta Digital Euro?**	Individual End-User	Pilot PSP and/or N/A	If the Individual End-User holds (also) online holdings, these can be defunded via app or browser.

sLM-24.05	**Requests defunding and specifies amount**	Individual End-User	Pilot PSP	The Individual End-User requests the defunding of the Beta Digital Euro payment account to a commercial bank money account via app or browser.
sLM-24.06	**Online manual defunding to commercial bank money account - same Pilot PSP [LM-2.1]**	Pilot PSP	N/A	In case the Individual End-User aims at defunding the Beta Digital Euro payment account to a commercial bank money account (account at same PSP), steps of **LM-2.1** are executed (starting from second step).

3. Transaction management

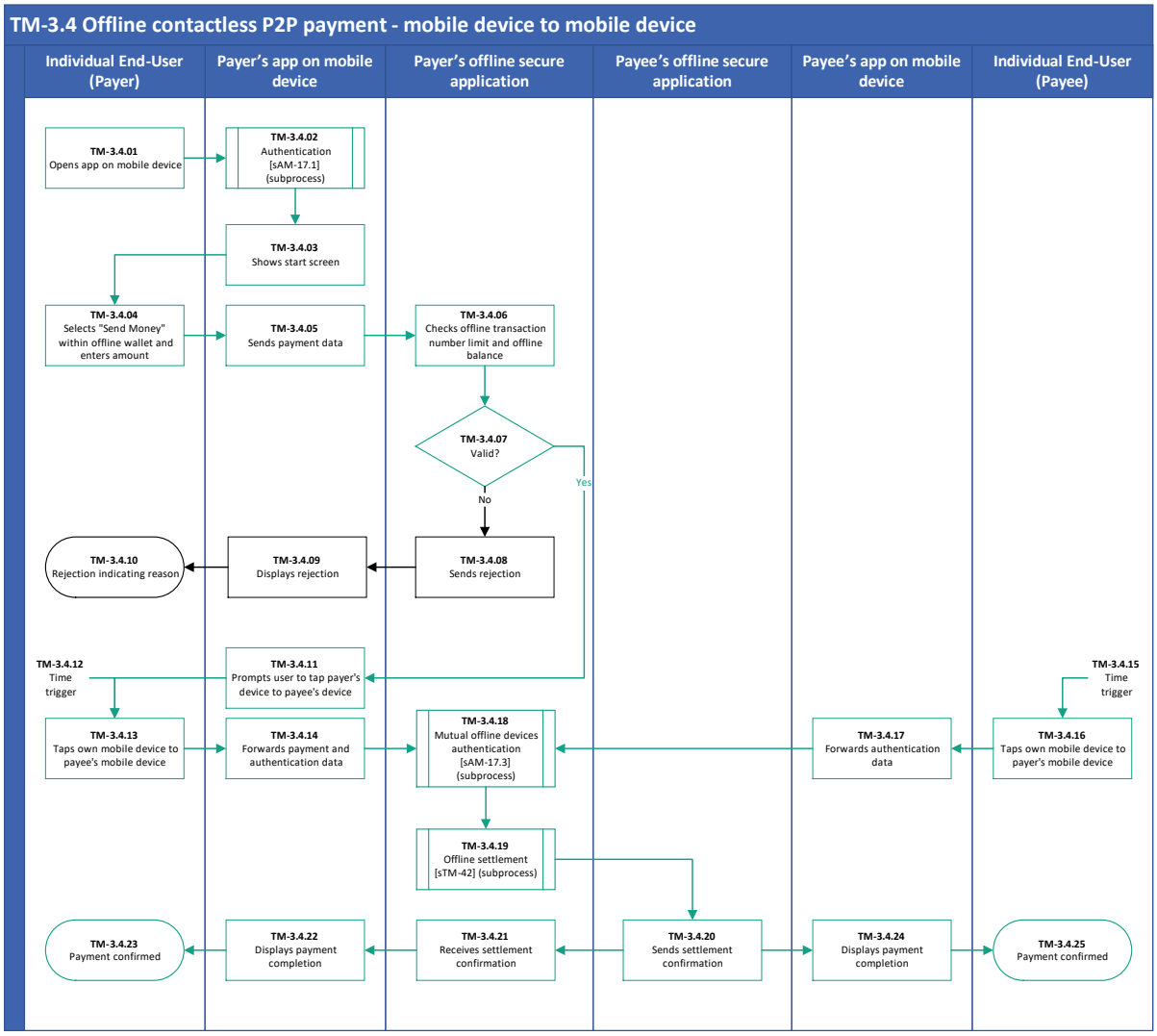
General business rules that refer to the transaction management flows: TM-000-001, TM-000-009.

3.1 Person-to-person payment

A P2P payment can only be performed via a mobile device while internet-based payment can be performed via mobile device or via browser.

3.1.1 P2P payment with NFC (offline), payer-initiated

The following flow presents and depicts all the steps characterising payer-generated P2P offline payments which are NFC-based via mobile device (either Eurosystem-provided app or proprietary Pilot PSP app).



TM-3.4 Offline contactless P2P payment - mobile device to mobile device

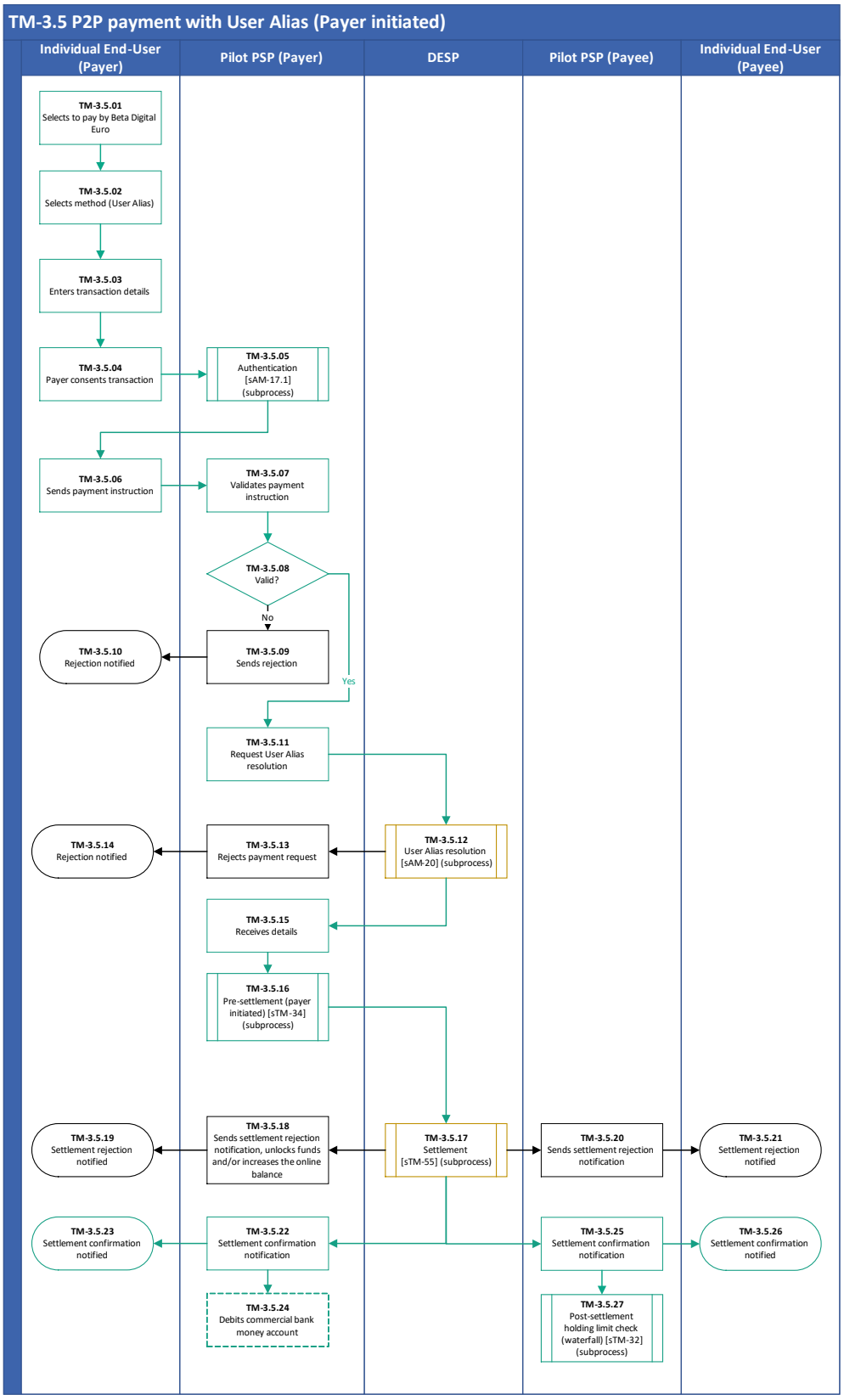
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-3.4.01	**Opens app on mobile device**	Individual End-User (Payer)	Payer's app on mobile device	The Individual End-User (Payer) opens app on mobile device.
TM-3.4.02	**Authentication [sAM-17.1]**	Payer's app on mobile device	N/A	The Payer's app on mobile device initiates authentication **[sAM-17.1]**
TM-3.4.03	**Shows start screen**	Payer's app on mobile device	Individual End-User (Payer)	The Payer's app on mobile device shows the start screen.
TM-3.4.04	**Selects "Send Money" within offline wallet and enters amount**	Individual End-User (Payer)	Payer's app on mobile device	The Individual End-User (Payer) selects "Send Money" within offline wallet and enters amount.

TM-3.4.05	**Sends payment data**	Payer's app on mobile device	Payer's offline secure application	The payer's app on mobile device sends the payment data to the payer's offline secure application.
TM-3.4.06	**Checks offline transaction number limit and offline balance**	Payer's offline secure application	N/A	The Payer's offline secure application checks offline transaction number limit and the offline balance.
TM-3.4.07	**Valid?**	Payer's offline secure application	Payer's app on mobile device and/or N/A	If the transaction is not in the limit and/or the offline balance is not sufficient, the Payer's offline secure application rejects the transaction. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
TM-3.4.08	**Sends rejection**	Payer's offline secure application	Payer's app on mobile device	The Payer's offline secure application rejects the request and sends a rejection message specifying the error type to the Payer's app on mobile device.
TM-3.4.09	**Displays rejection**	Payer's app on mobile device	Individual End-User (Payer)	The Payer's app on mobile device displays rejection with the rejection reason.
TM-3.4.10	**Rejection indicating reason**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the rejection and the rejection reason.
TM-3.4.11	**Prompts user to tap payer's device to payee's device**	Payer's app on mobile device	Individual End-User (Payer)	The Payer's app on mobile device prompts the user to tap payer's device to payee's device.
TM-3.4.12	**Time trigger**	Individual End-User (Payer)	N/A	Time elapses on the payer side to get the device ready
TM-3.4.13	**Taps own mobile device to payee's mobile device**	Individual End-User (Payer)	Payer's app on mobile device	The Individual End-User (Payer) taps own mobile device to payee's mobile device.
TM-3.4.14	**Forwards payment and authentication data**	Payer's app on mobile device	Payer's offline secure application	The Payer's app on mobile device forwards the payment and authentication data to the payer's offline secure application.
TM-3.4.15	**Time trigger**	Individual End-User (Payee)	N/A	Time elapses on the Payee side to get the device ready.
TM-3.4.16	**Taps own mobile device to payer's mobile device**	Individual End-User (Payee)	Payee's app on mobile device	The Individual End-User (Payee) taps own mobile device to payer's mobile device.

TM-3.4.17	**Forwards payment and authentication data**	Payee's app on mobile device	Payer's offline secure application	The Payee's app on mobile device forwards the payment and authentication data to the Payer's offline secure application.
TM-3.4.18	**Mutual offline secure application authentication [sAM-17.3]**	Payer's offline secure application	N/A	The Payer's offline secure application performs mutual offline secure application authentication **[sAM-17.3].**
TM-3.4.19	**Offline settlement [sTM-42]**	Payer's offline secure application	Payee's offline secure application	The Payer's offline secure application initiates offline settlement **[sTM-42].** *Note: The order of the Payer and Payee lane has been reversed in the sub-process.*
TM-3.4.20	**Sends settlement confirmation**	Payee's offline secure application	Payer's offline secure application and/or Payee's app on mobile device	The Payee's offline secure application sends settlement confirmation to the Payer's offline secure application and Payee's mobile app on mobile device.
TM-3.4.21	**Receives settlement confirmation**	Payer's offline secure application	Payer's app on mobile device	The Payer's offline secure application receives settlement confirmation from the Payee's offline secure application.
TM-3.4.22	**Displays payment completion**	Payer's app on mobile device	Individual End-User (Payer)	The Payer's app on mobile device displays payment completion.
TM-3.4.23	**Payment confirmed**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is informed that the payment has been completed.
TM-3.4.24	**Displays payment completion**	Payee's app on mobile device	Individual End-User (Payee)	The Payee's app on mobile device displays payment completion.
TM-3.4.25	**Payment confirmed**	Individual End-User (Payee)	N/A	The Individual End-User (Payee) is informed that the payment has been completed.

3.1.2 P2P payment via User Alias (Payer initiated)

The following flow presents and depicts all the steps characterising P2P payments via User Alias with waterfall function when it's initiated by the Payer.



TM-3.5 P2P payment with User Alias (Payer initiated)

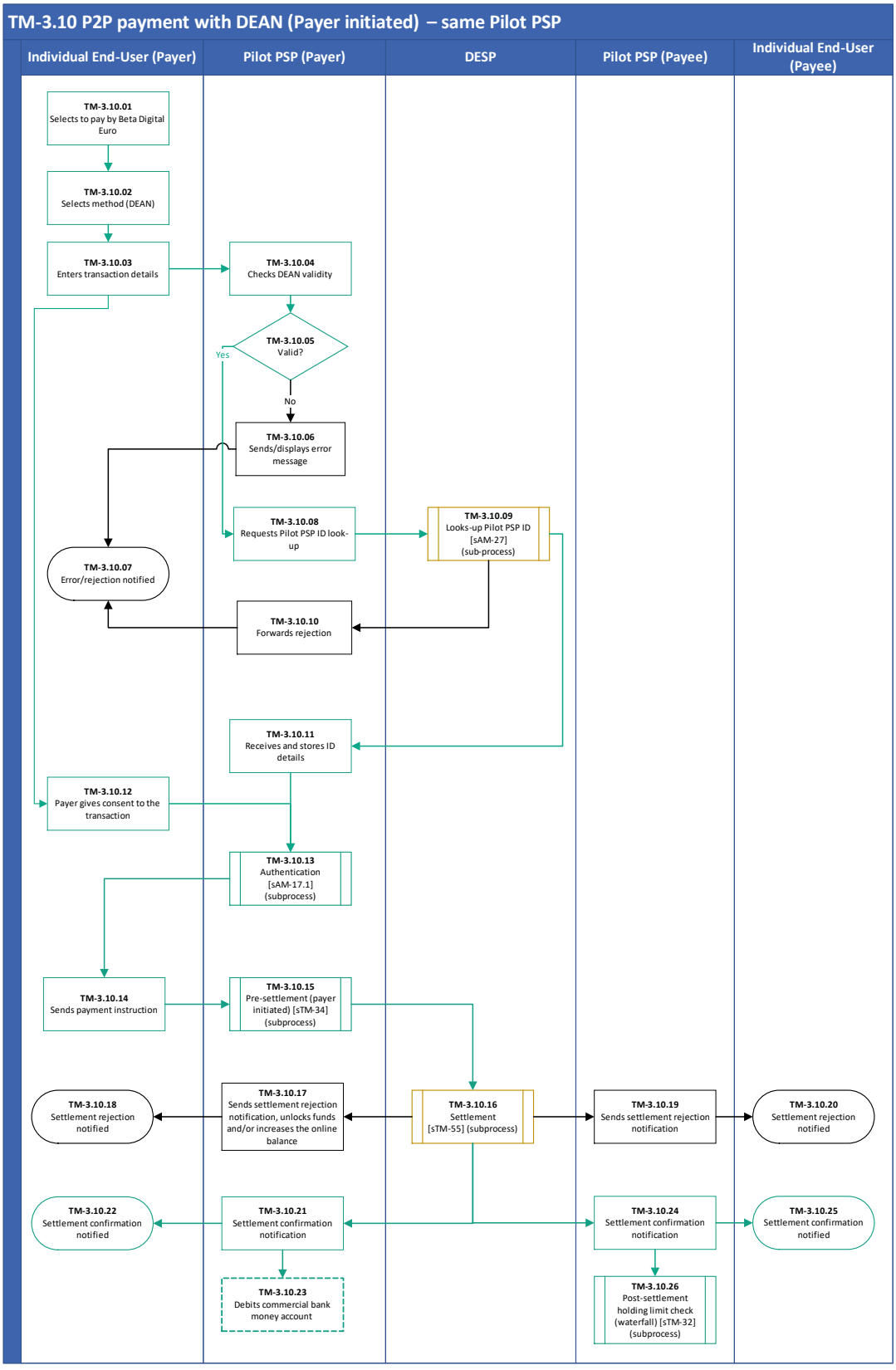
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-3.5.01	**Selects to pay by Beta Digital Euro**	Individual End-User (Payer)	N/A	The Payer opens the app and selects the option for pay with Beta Digital Euro.
TM-3.5.02	**Selects method (User Alias)**	Individual End-User (Payer)	N/A	The Payer selects the User Alias option for enters the transaction details in the app.
TM-3.5.03	**Enters transaction details**	Individual End-User (Payer)	N/A	The Payer enters the transaction details in the app.
TM-3.5.04	**Payer consents transaction**	Individual End-User (Payer)	Pilot PSP (Payer)	The Payer consents with the transaction details.
TM-3.5.05	**Authentication [sAM-17.1]**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP initiates the authentication **[sAM-17.1].**
TM-3.5.06	**Sends payment instruction**	Individual End-User (Payer)	Pilot PSP (Payer)	The Payer sends the payment instruction, including the User Alias of the Payee, to the Payer's Pilot PSP.
TM-3.5.07	**Validates payment instruction**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP validates the payment instruction.
TM-3.5.08	**Valid?**	Pilot PSP (Payer)	N/A	If the payment request is not valid, the Payer's Pilot PSP rejects the payment request.
TM-3.5.09	**Sends rejection**	Pilot PSP (Payer)	Individual End-User (Payer)	The Pilot PSP rejects the request and sends a rejection message specifying the error type the Individual End-User. *Step-specific business rules: TM-000-003*
TM-3.5.10	**Rejection notified**	Individual End-User (Payer)	N/A	The Payer is notified of the transaction request rejection and the rejection reason.
TM-3.5.11	**Request User Alias resolution**	Pilot PSP (Payer)	DESP	The Payer's Pilot PSP sends an User Alias look-up request to the DESP. *Step-specific business rules: AM-021-010*
TM-3.5.12	**User Alias resolution [sAM-20]**	DESP	Pilot PSP (Payer)	The DESP initiates the User Alias resolution **[sAM-20].** *Step-specific business rules: AM-021-010*
TM-3.5.13	**Rejects payment request**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP rejects the payment request and notifies the Payer of the rejection. *Step-specific business rules: TM-000-003*
TM-3.5.14	**Rejection notified**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the rejection and the rejection reason.
TM-3.5.15	**Receives details**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP receives details (PSP identifier and corresponding

				DEAN) from the DESP. *Step-specific business rules: AM-021-010*
TM-3.5.16	**Pre-settlement (payer initiated) [sTM-34]**	Pilot PSP (Payer)	DESP	Subprocess of pre-settlement (Payer's perspective) **[sTM-34].** *Step-specific business rules: AM-021-010*
TM-3.5.17	**Settlement [sTM-55]**	DESP	Pilot PSP (Payer) and/or Pilot PSP (Payee)	The DESP performs settlement **[sTM-55].**
TM-3.5.18	**Sends settlement rejection notification, unlocks funds and/or increases the online balance**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP receives the settlement rejection notification and the rejection reason from the DESP, sends the rejection notification to the Payer. The Payer's Pilot PSP increases the online balance of the Payer if previously decreased and unlocks the funds, if previously locked, in the Payer's commercial bank money account. *Step-specific business rules: LM-030-003, TM-000-003*
TM-3.5.19	**Settlement rejection notified**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement rejection and the rejection reason.
TM-3.5.20	**Sends settlement rejection notification**	Pilot PSP (Payee)	Individual End-User (Payee)	The Payee's Pilot PSP sends the settlement rejection notification and the rejection reason to the Individual End-User (Payee). *Step-specific business rules: TM-000-003*
TM-3.5.21	**Settlement rejection notified**	Individual End-User (Payee)	N/A	The Payee is notified of the settlement rejection.
TM-3.5.22	**Settlement confirmation notification**	Pilot PSP (Payer)	Individual End-User (Payer) and/or N/A	The Payer's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payer. *Step-specific business rules: TM-000-006*
TM-3.5.23	**Settlement confirmation notified**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement.
TM-3.5.24	**Debits commercial bank money account**	Pilot PSP (Payer)	N/A	**Optional:** the Payer's Pilot PSP debits the Payer's commercial bank money account for the funded amount (which may have been blocked earlier on the account). This step is required in case of reverse waterfall (i.e., not sufficient online Beta Digital Euro on Payer side for this payment). *Step-specific business rules: TM-000-*

				006
TM-3.5.25	**Settlement confirmation notification**	Pilot PSP (Payee)	Individual End-User (Payee) and/or N/A	The Payee's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payee. *Step-specific business rules: TM-000-006*
TM-3.5.26	**Settlement confirmation notified**	Individual End-User (Payee)	N/A	The Payee is notified of the settlement.
TM-3.5.27	**Post-settlement holding limit check (waterfall) [sTM-32]**	Pilot PSP (Payee)	N/A	The subprocess of post-settlement holding limit check (waterfall) **[sTM-32]** responsible for increasing the online balance and eventually crediting the Payee's commercial bank money account. *Note: this sub process is triggered post settlement to ensure that the holding limit is not exceeded in case of concurrent inbound payments.* An additional defunding step after settlement in case of incoming payment to Individual End-User is required to handle the following scenario: -Incoming transaction 1 is received. The check is performed to verify if it would result in a breach of the holding limit. This is not the case. Waterfall is not triggered. -Incoming transaction 2 is received. The check is performed to verify if it would result in a breach of the holding limit. This is not the case at this point in time. However, after settlement of incoming transaction 1, transaction 2 would breach the holding limit. Waterfall is not triggered by the standard validation. To ensure the holding limit, the additional waterfall step post settlement is performed.

3.1.3 P2P payment with DEAN (Payer initiated) – same Pilot PSP

The following flow presents and depicts all the steps characterising P2P payment with DEAN (Payer initiated) same Pilot PSP.



TM-3.10 P2P payment with DEAN (Payer initiated) – same Pilot PSP

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-3.10.01	**Selects to pay by Beta Digital Euro**	Individual End-User (Payer)	N/A	The Payer opens the app and select the option for pay with Beta Digital Euro.
TM-3.10.02	**Selects method (DEAN)**	Individual End-User (Payer)	N/A	The Payer selects the DEAN option for enters the transaction details in the app.
TM-3.10.03	**Enters transaction details**	Individual End-User (Payer)	N/A and/or Pilot PSP (Payer)	The Payer enters the transaction details (including the Payee's DEAN) in the app.
TM-3.10.04	**Checks DEAN validity**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP checks whether the Payee's DEAN, entered by the Payer, is valid.
TM-3.10.05	**Valid?**	Pilot PSP (Payer)	N/A	If the entered DEAN is not valid, the Payer's Pilot PSP rejects the request. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
TM-3.10.06	**Sends/displays error message**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP sends/displays an error message specifying the error type to the Individual End-User. The Individual End-User may then re-enter the DEAN. *Step-specific business rules: TM-000-003*
TM-3.10.07	**Error/rejection notified**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the error/rejection and the rejection reason. *Note: the Individual End-User can correct the entered DEAN or enter a new one.*
TM-3.10.08	**Requests Pilot PSP ID look-up**	Pilot PSP (Payer)	DESP	The Payer's Pilot PSP requests the DESP to look up the Pilot PSP ID corresponding to the DEAN.
TM-3.10.09	**Looks-up Pilot PSP ID [sAM-27]**	DESP	Pilot PSP (Payer)	The DESP initiates the Looks-up Pilot PSP's ID sub-flow **[sAM-27].**
TM-3.10.10	**Forwards rejection**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP forwards the payment rejection with the rejection reason to the Payer. *Step-specific business rules: TM-000-003*
TM-3.10.11	**Receives and stores ID details**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP receives the PSP identifier from the DESP and stores the details (for future use).
TM-3.10.12	**Payer gives consent to the transaction**	Individual End-User (Payer)	Pilot PSP (Payer)	The Payer consents with the transaction details.
TM-3.10.13	**Authentication [sAM-17.1]**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP initiates the authentication of the Payer **[sAM-17.1].**

TM-3.10.14	**Sends payment instruction**	Individual End-User (Payer)	Pilot PSP (Payer)	The Payer sends the payment instruction, including the DEAN of the Payee, to the Payer's Pilot PSP.
TM-3.10.15	**Pre-settlement (payer initiated) [sTM-34]**	Pilot PSP (Payer)	DESP	The Payer's Pilot PSP performs pre-settlement (Payer initiated) **[sTM-34].**
TM-3.10.16	**Settlement [sTM-55]**	DESP	Pilot PSP (Payer) and/or Pilot PSP (Payee)	The DESP performs settlement **[sTM-55].**
TM-3.10.17	**Sends settlement rejection notification, unlocks funds and/or increases the online balance**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP receives the settlement rejection notification and the rejection reason from the DESP, sends the rejection notification to the Payer. The Payer's Pilot PSP increases the online balance of the Payer if previously decreased and unlocks the funds, if previously locked, in the Payer's commercial bank money account. *Step-specific business rules: LM-030-003, TM-000-003*
TM-3.10.18	**Settlement rejection notified**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement rejection and the rejection reason.
TM-3.10.19	**Sends settlement rejection notification**	PSP (Payee)	Individual End-User (Payee)	The Payee's PSP sends the settlement rejection notification and the rejection to the Individual End-User (Payee) *Step-specific business rules: TM-000-003*
TM-3.10.20	**Settlement rejection notified**	Individual End-User (Payee)	N/A	The Payee is notified of the settlement rejection and the rejection reason.
TM-3.10.21	**Settlement confirmation notification**	Pilot PSP (Payer)	Individual End-User (Payer) and/or N/A	The Payer's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payer. *Step-specific business rules: TM-000-006*
TM-3.10.22	**Settlement confirmation notified**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement.
TM-3.10.23	**Debits commercial bank money account**	Pilot PSP (Payer)	N/A	**Optional**: the Payer's Pilot PSP debits the Payer's commercial bank money account for the funded amount (which may have been blocked earlier on the account). This step is required in case of reverse waterfall (i.e., not sufficient online Beta Digital Euro on Payer side for this payment). *Step-specific business rules: TM-000-006*
TM-3.10.24	**Settlement confirmation notification**	Pilot PSP (Payee)	Individual End-User (Payee) and/or N/A	The Payee's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payee. *Step-specific business rules: TM-000-006*

TM-3.10.25	**Settlement confirmation notified**	Individual End-User (Payee)	N/A	The Payee is notified of the settlement.
TM-3.10.26	**Post-settlement holding limit check (waterfall) [sTM-32]**	Pilot PSP (Payee)	N/A	The subprocess of post-settlement holding limit check (waterfall) **[sTM-32]** responsible for increasing the online balance and eventually crediting the Payee's commercial bank money account. Note: this sub process is triggered post settlement to ensure that the holding limit is not exceeded in case of concurrent inbound payments. An additional defunding step after settlement in case of incoming payment to Individual End-User is required to handle the following scenario: -Incoming transaction 1 is received. The check is performed to verify if it would result in a breach of the holding limit. This is not the case. Waterfall is not triggered. -Incoming transaction 2 is received. The check is performed to verify if it would result in a breach of the holding limit. This is not the case at this point in time. However, after settlement of incoming transaction 1, transaction 2 would breach the holding limit. Waterfall is not triggered by the standard validation. To ensure the holding limit, the additional waterfall step post settlement is performed.

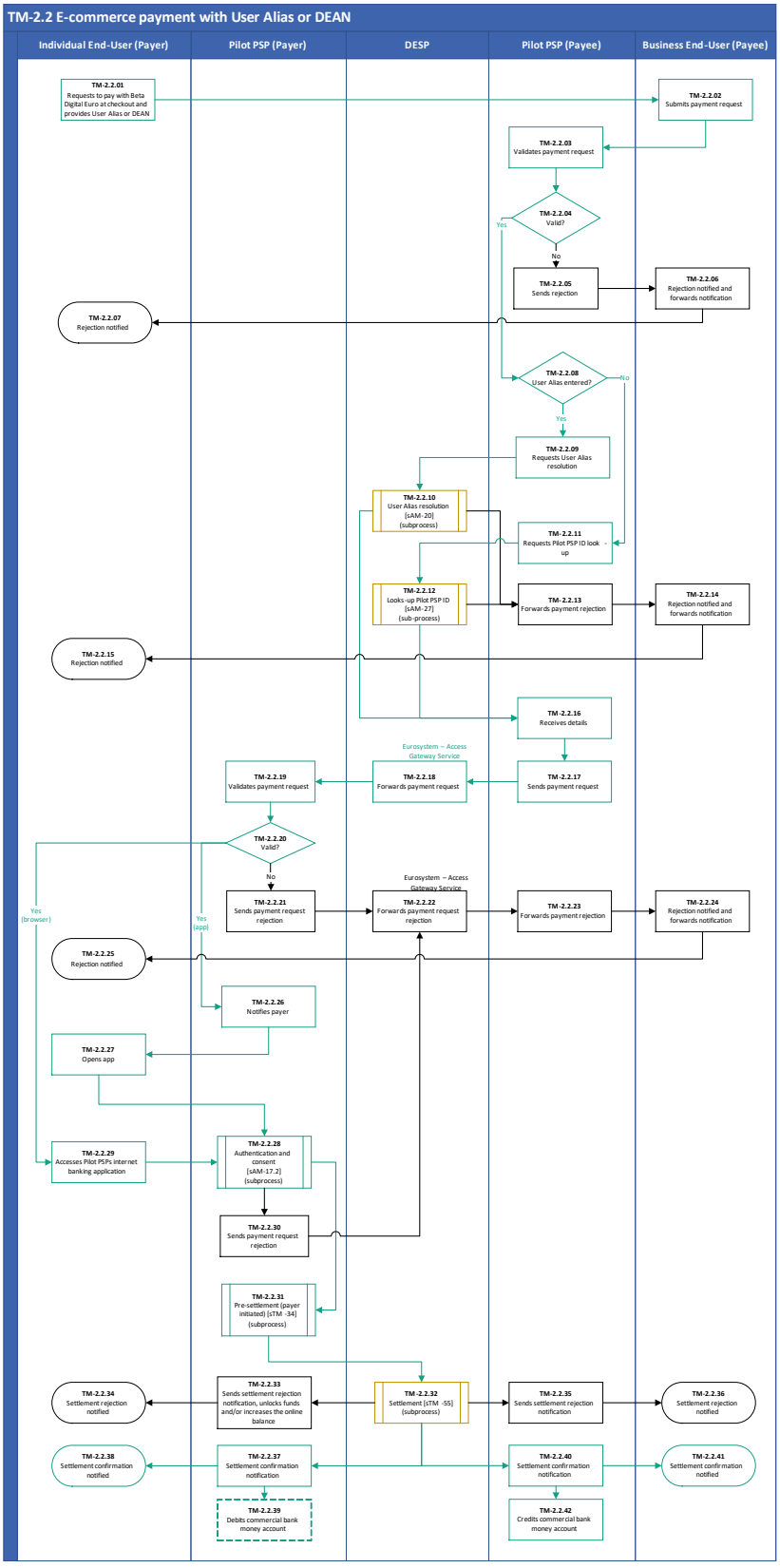
3.2 E-commerce payment

An Individual End-User may choose to pay with Beta Digital Euro on an e-commerce platform if Beta Digital Euro is offered as a mean of payment[1]. In this case the Individual End-User intends to buy a product or service in a business app or on a website (i.e. online interface) via a mobile device or computer.

3.2.1 E-commerce payment with User Alias or DEAN

The following flow presents and depicts all the steps characterising e-commerce payments where the Payer provides her own User Alias or DEAN.

[1] In line with the mandatory acceptance provisions as reported in the proposed regulation of the European Parliament and of the Council on the establishment of the digital euro.



TM-2.2 E-commerce payment with User Alias or DEAN

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-2.2.01	**Requests to pay with Beta Digital Euro at checkout and provides User Alias or DEAN**	Individual End-User (Payer)	Business End-User (Payee)	The Payer requests at checkout to pay with Beta Digital Euro, enters the User Alias or DEAN and confirms the purchase.
TM-2.2.02	**Submits payment request**	Business End-User (Payee)	Pilot PSP (Payee)	The Payee submits the details for the payment request to the Pilot PSP.
TM-2.2.03	**Validates payment request**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP validates the request and determines whether the request includes an User Alias or the DEAN of the Payer.
TM-2.2.04	**Valid?**	Pilot PSP (Payee)	N/A	If the request (including entered User Alias or DEAN) is not valid, the Payee's Pilot PSP rejects the request. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
TM-2.2.05	**Sends rejection**	Pilot PSP (Payee)	Business End-User (Payee)	The Payee's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Business End-User. The Business End-User may ask the Payer to then re-enter the DEAN/User Alias. *Step-specific business rules: TM-000-003*
TM-2.2.06	**Rejection notified and forwards notification**	Business End-User (Payee)	Individual End-User (Payer)	The Business End-User (Payee) is notified of the error/rejection and the rejection reason and notifies the Payer.
TM-2.2.07	**Rejection notified**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the rejection and the rejection reason. Depending on the reason, the Payer can re-enter the DEAN/User Alias
TM-2.2.08	**User Alias entered?**	Pilot PSP (Payee)	N/A	If the Payer has entered an User Alias, the Pilot PSP proceeds with User Alias resolution. In case of a DEAN, the Pilot Payee's PSP would look up the Payer's Pilot PSP ID.
TM-2.2.09	**Requests User Alias resolution**	Pilot PSP (Payee)	DESP	The Payee's Pilot PSP requests the Payer's DEAN and Pilot PSP ID from the DESP. *Step-specific business rules: AM-021-010*
TM-2.2.10	**User Alias resolution [sAM-20]**	DESP	Pilot PSP (Payee)	The DESP initiates the User Alias resolution process **[sAM-20]**.
TM-2.2.11	**Requests Pilot PSP ID look-up**	Pilot PSP (Payee)	DESP	The Payee's Pilot PSP requests the DESP to look up the Pilot PSP ID corresponding to the DEAN.

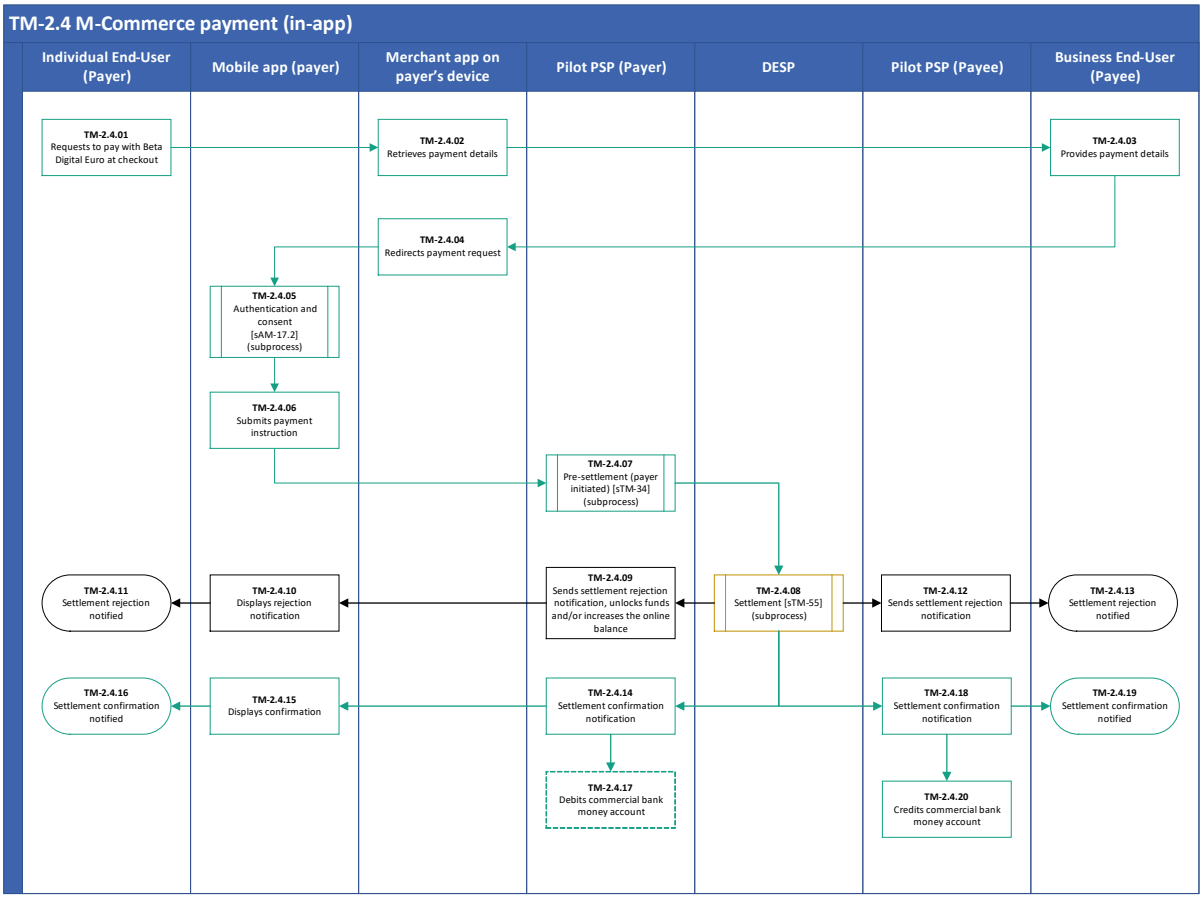
TM-2.2.12	**Looks-up Pilot PSP ID [sAM-27]**	DESP	Pilot PSP (Payee)	The DESP initiates the Looks-up Pilot PSP's ID **[sAM-27]**
TM-2.2.13	**Forwards payment rejection**	Pilot PSP (Payee)	Business End-User (Payee)	The Payee's Pilot PSP forwards the payment rejection and the rejection reason to the Business End-User (Payee). *Step-specific business rules: TM-000-003*
TM-2.2.14	**Rejection notified and forwards notification**	Business End-User (Payee)	Individual End-User (Payer)	The Payee is notified of the transaction request rejection and the rejection reason and informs the Individual End-User about the rejection. The Business End-User then can try again.
TM-2.2.15	**Rejection notified**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the rejection and the rejection reason.
TM-2.2.16	**Receives details**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP receives details (Pilot PSP identifier and corresponding DEAN in the case of entered User Alias) from the DESP. *Step-specific business rules: AM-021-010*
TM-2.2.17	**Sends payment request**	Pilot PSP (Payee)	DESP	The Payee Pilot PSP sends the payment request to the DESP. *Step-specific business rules: AM-021-010*
TM-2.2.18	**Forwards payment request**	DESP	Pilot PSP (Payer)	The Eurosystem - Access Gateway Service forwards the payment request to the Payer Pilot PSP.
TM-2.2.19	**Validates payment request**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP receives and validates the payment request.
TM-2.2.20	**Valid?**	Pilot PSP (Payer)	N/A and/or Individual End-User (Payer)	If the request (including entered User Alias or DEAN) is not valid, the Payer's Pilot PSP rejects the request. If the request is valid, the Pilot PSP waits for the Payer's consent or rejection. Such consent (preceded by an authentication of the Payer) may be given via browser or via app. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
TM-2.2.21	**Sends payment request rejection**	Pilot PSP (Payer)	DESP	The Payer Pilot PSP rejects the payment request and sends a rejection message specifying the error type to the DESP. *Step-specific business rules: TM-000-003*
TM-2.2.22	**Forwards payment request rejection**	DESP	Pilot PSP (Payee)	The Eurosystem - Access Gateway Service forwards the request rejection and the rejection reason to the Payee Pilot PSP.

TM-2.2.23	**Forwards payment rejection**	Pilot PSP (Payee)	Business End-User (Payee)	The Payee Pilot PSP forwards the payment rejection and the rejection reason to the Business End-User (Payee). *Step-specific business rules: TM-000-003*
TM-2.2.24	**Rejection notified and forwards notification**	Business End-User (Payee)	Individual End-User (Payer)	The Payee is notified of the transaction request rejection and the rejection reason and informs the Individual End-User about the rejection. The Business End-User then can try again.
TM-2.2.25	**Rejection notified**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the rejection and the rejection reason.
TM-2.2.26	**Notifies payer**	Pilot PSP (Payer)	Individual End-User (Payer)	If the Payer has an app, the Payer Pilot PSP notifies the Payer of the payment request received.
TM-2.2.27	**Opens app**	Individual End-User (Payer)	Pilot PSP (Payer)	After receiving the notification, the Payer opens the app to view and approve the payment request. Alternatively, the Payer may use the Pilot PSP's internet banking application to view and approve the payment request.
TM-2.2.28	**Authentication and consent [sAM-17.2]**	PSP (Payer)	N/A	The Pilot PSP initiates authentication and consent **[sAM-17.2].**
TM-2.2.29	**Accesses PSPs internet banking application**	Individual End-User (Payer)	Pilot PSP (Payer)	The Payer opens its Pilot PSP's internet banking environment via the browser to view and approve the payment request. Alternatively, the Payer may use the app to view and approve the payment request.
TM-2.2.30	**Sends payment request rejection**	Pilot PSP (Payer)	DESP	The Payer Pilot PSP rejects the payment request and sends a rejection message specifying the error type to the Eurosystem - Access Gateway Service. *Step-specific business rules: TM-000-003*
TM-2.2.31	**Pre-settlement (payer initiated) [sTM-34])**	Pilot PSP (Payer)	DESP	Subprocess of pre-settlement (Payer's perspective) **[sTM-34].**
TM-2.2.32	**Settlement [sTM-55]**	DESP	Pilot PSP (Payer) and/or Pilot PSP (Payee)	The DESP performs settlement **[sTM-55].**
TM-2.2.33	**Sends settlement rejection notification, unlocks funds and/or increases**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP receives the settlement rejection notification and the rejection reason from the DESP, sends the rejection notification to the Payer. The Payer's Pilot PSP increases the online balance of the Payer if previously decreased and unlocks the funds, if previously locked, in the Payer's commercial bank money account.

	the online balance			*Step-specific business rules: LM-030-003, TM-000-003*
TM-2.2.34	**Settlement rejection notified**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement rejection and the rejection reason.
TM-2.2.35	**Sends settlement rejection notification**	Pilot PSP (Payee)	Business End-User (Payee)	The Payee's Pilot PSP sends the settlement rejection notification and the rejection reason to the Business End-User (Payee). *Step-specific business rules: TM-000-003*
TM-2.2.36	**Settlement rejection notified**	Business End-User (Payee)	N/A	The Payee is notified of the settlement rejection and the rejection reason.
TM-2.2.37	**Settlement confirmation notification**	Pilot PSP (Payer)	Individual End-User (Payer) and/or N/A	The Payer's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payer. *Step-specific business rules: TM-000-006*
TM-2.2.38	**Settlement confirmation notified**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement.
TM-2.2.39	**Debits commercial bank money account**	Pilot PSP (Payer)	N/A	**Optional**: the Payer's Pilot PSP debits the Payer's commercial bank money account for the funded amount (which may have been blocked earlier on the account). This step is required in case of reverse waterfall (i.e., not sufficient online Beta Digital Euro on Payer side for this payment). *Step-specific business rules: TM-000-006*
TM-2.2.40	**Settlement confirmation notification**	PSP (Payee)	Business End-User (Payee) and/or N/A	The Payee's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payee. *Step-specific business rules: TM-000-006*
TM-2.2.41	**Settlement confirmation notified**	Business End-User (Payee)	N/A	The Payee is notified of the settlement.
TM-2.2.42	**Credits commercial bank money account**	Pilot PSP (Payee)	N/A	The Pilot PSP credits the commercial bank money account for the defunded amount. This step is required in case of waterfall (mandatory in case of a Business End-User, optional in case of an Individual End-User). *Step-specific business rules: LM-050-003, TM-000-006*

3.2.2 M-commerce payment via mobile app

The following flow presents and depicts all the steps characterising an e-commerce payments via merchant app and mobile app (either Eurosystem-provided app or proprietary Pilot PSP app) installed on the Individual End-User's mobile device.



TM-2.4 M-Commerce payment (in-app)

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-2.4.01	**Requests to pay with Beta Digital Euro at checkout**	Individual End-User (Payer)	Merchant app on payer's device	The Individual End-User (Payer) requests at checkout to pay with Beta Digital Euro in their merchant app or by using its mobile app. *Note: the merchant app is the m-commerce app installed on the Payer's mobile device.*
TM-2.4.02	**Retrieves payment details**	Merchant app on payer's device	Business End-User (Payee)	The merchant app retrieves the payment details and the details of the merchant.
TM-2.4.03	**Provides payment details**	Business End-User (Payee)	Merchant app on payer's device	The merchant provides their details.
TM-2.4.04	**Redirects payment request**	Merchant app on	Mobile app (payer)	The merchant app redirects the payment request with the provided details to the mobile

		payer's device		app of the Payer.
TM-2.4.05	**Authentication and consent [sAM-17.2]**	Mobile app (payer)	N/A	The mobile app initiates the authentication and consent **[sAM-17.2].**
TM-2.4.06	**Submits payment instruction**	Mobile app (payer)	Pilot PSP (Payer)	The mobile app will submit the payment instruction (including the coded user details containing the Payer's details) after the Individual End-User (Payer) has confirmed the payment.
TM-2.4.07	**Pre-settlement (payer initiated) [sTM-34]**	Pilot PSP (Payer)	DESP	Subprocess of pre-settlement (Payer's perspective) **[sTM-34].**
TM-2.4.08	**Settlement [sTM-55]**	DESP	Pilot PSP (Payer) and/or Pilot PSP (Payee)	The subprocess of settlement. The DESP performs settlement **[sTM-55].**
TM-2.4.09	**Sends settlement rejection notification, unlocks funds and/or increases the online balance**	Pilot PSP (Payer)	Mobile app (payer)	The Payer's Pilot PSP receives the settlement rejection notification and rejection reason from the DESP, sends the rejection notification to the Payer. The Payer's Pilot PSP increases the online balance of the Payer if previously decreased and unlocks the funds, if previously locked, in the Payer's commercial bank money account. *Step-specific business rules: LM-030-003, TM-000-003*
TM-2.4.10	**Displays rejection notification**	Mobile app (payer)	Individual End-User (Payer)	The Payer's mobile app displays the rejection notification with the rejection reason to the Payer.
TM-2.4.11	**Settlement rejection notified**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement rejection and the rejection reason.
TM-2.4.12	**Sends settlement rejection notification**	Pilot PSP (Payee)	Business End-User (Payee)	The Payee's Pilot PSP sends the settlement rejection notification with the rejection reason to the Business End-User (Payee). *Step-specific business rules: TM-000-003*
TM-2.4.13	**Settlement rejection notified**	Business End-User (Payee)	N/A	The Payee is notified of the settlement rejection and the rejection reason.
TM-2.4.14	**Settlement confirmation notification**	Pilot PSP (Payer)	N/A and/or Mobile app (payer)	The Payer's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payer. *Step-specific business rules: TM-000-006*
TM-2.4.15	**Displays confirmation**	Mobile app (payer)	Individual End-User (Payer)	The Payer's mobile app displays the confirmation notification to the Payer.
TM-2.4.16	**Settlement confirmation notified**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement.

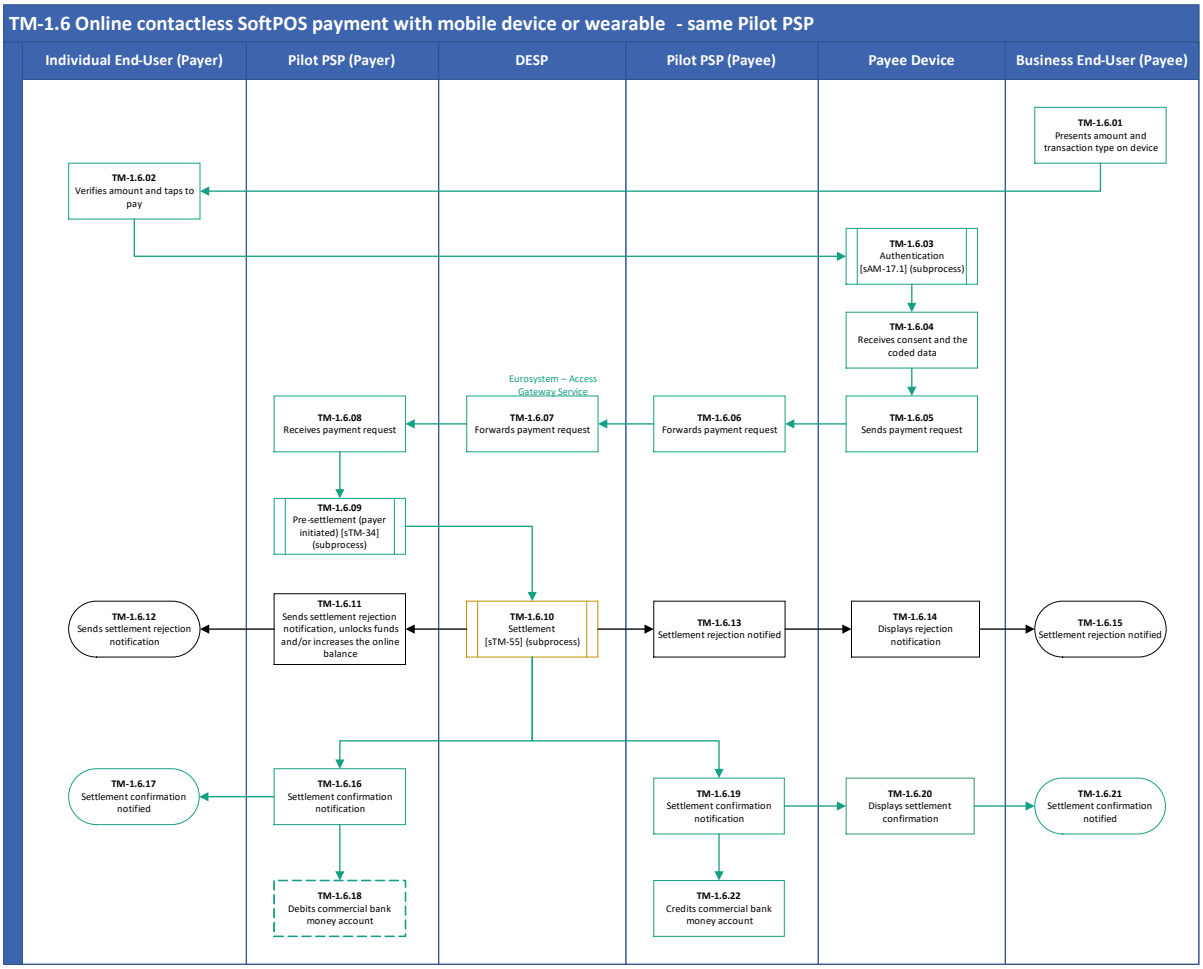
TM-2.4.17	**Debits commercial bank money account**	Pilot PSP (Payer)	N/A	**Optional** - the Payer's Pilot PSP debits the Payer's commercial bank money account for the funded amount (which may have been blocked earlier on the account). This step is required in case of reverse waterfall (i.e., not sufficient online Beta Digital Euro on Payer side for this payment). *Step-specific business rules: TM-000-006*
TM-2.4.18	**Settlement confirmation notification**	Pilot PSP (Payee)	Business End-User (Payee) and/or N/A	The Payee's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payee. *Step-specific business rules: TM-000-006*
TM-2.4.19	**Settlement confirmation notified**	Business End-User (Payee)	N/A	The Payee is notified of the settlement.
TM-2.4.20	**Credits commercial bank money account**	Pilot PSP (Payee)	N/A	The Pilot PSP credits the commercial bank money account for the defunded amount. This step is required in case of waterfall (mandatory in case of a Business End-User, optional in case of an Individual End-User). *Step-specific business rules: LM-050-003, TM-000-006*

3.3 Point-of-Sale payment

At the SoftPOS an Individual End-User may always choose to pay with a smartphone.

3.3.1 NFC-based online payment via mobile device at SoftPOS – same Pilot PSP

The following flow presents all the steps characterising SoftPOS online payments with NFC:



TM-1.6 Online contactless SoftPOS payment with mobile device - same Pilot PSP

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-1.6.01	**Presents amount and transaction type on device**	Business End-User (Payee)	Individual End-User (Payer)	The Business End-User opens the SoftPOS application and enters the total amount to be paid, the transaction type and presents it to the Payer on the device.
TM-1.6.02	**Verifies amount and taps to pay**	Individual End-User (Payer)	Payee Device	The Payer verifies the amount on Payee device and consents by holding their NFC enabled device near the Payee device. Depending on the Payer's chosen settings and recent transactions (e.g. authentication frequency and limit) the authentication step may not be required. *Note: the Payer does not share the user and account details with the Payee but only the previously generated surrogate value.* The surrogate value needs to contain the identification of the Payer's Pilot PSP in readable format to facilitate routing. In case of decoding by

				the Payer's Pilot PSP (the design choice is yet to be confirmed).
TM-1.6.03	**Authentication [sAM-17.1]**	Payee Device	N/A	The Payee device initiates the authentication **[sAM-17.1].**
TM-1.6.04	**Receives consent and the coded data**	Payee Device	N/A	The Payee device receives the consent (including the Payer's coded user details).
TM-1.6.05	**Sends payment request**	Payee Device	Pilot PSP (Payee)	The Payee device sends the payment request to the Payee's Pilot PSP.
TM-1.6.06	**Forwards payment request**	Pilot PSP (Payee)	DESP	The Payee's Pilot PSP forwards the payment request to the DESP.
TM-1.6.07	**Forwards payment request**	DESP	Pilot PSP (Payer)	The Eurosystem - Access Gateway Service forwards the payment request to the Payer's Pilot PSP.
TM-1.6.08	**Receives payment request**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP receives the payment request.
TM-1.6.09	**Pre-settlement (payer initiated) [sTM-34]**	Pilot PSP (Payer)	DESP	Subprocess of pre-settlement (Payer's perspective) **[sTM-34].**
TM-1.6.10	**Settlement [sTM-55]**	DESP	Pilot PSP (Payer) and/or Pilot PSP (Payee)	The DESP performs settlement **[sTM-55].**
TM-1.6.11	**Sends settlement rejection notification, unlocks funds and/or increases the online balance**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP receives the settlement rejection notification and the rejection reason from the DESP, sends the rejection notification to the Payer. The Payer's Pilot PSP increases the online balance of the Payer if previously decreased and unlocks the funds, if previously locked, in the Payer's commercial bank money account. *Step-specific business rules: LM-030-003, TM-000-003*
TM-1.6.12	**Sends settlement rejection notification**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement rejection and the rejection reason.
TM-1.6.13	**Settlement rejection notified**	Pilot PSP (Payee)	Payee Device	The Payee's Pilot PSP sends the settlement rejection notification and the rejection reason to the SoftPOS. *Step-specific business rules: TM-000-003*
TM-1.6.14	**Displays rejection notification**	Payee Device	Business End-User (Payee)	The Payee device displays the rejection notification with the rejection reason to the Business End-User.
TM-1.6.15	**Settlement rejection notified**	Business End-User (Payee)	N/A	The Payee is notified of the settlement rejection and the rejection reason.

TM-1.6.16	**Settlement confirmation notification**	Pilot PSP (Payer)	Individual End-User (Payer) and/or N/A	The Payer's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payer. *Step-specific business rules: TM-000-006*
TM-1.6.17	**Settlement confirmation notified**	Individual End-User (Payer)	N/A	The Payer is notified of the settlement.
TM-1.6.18	**Debits commercial bank money account**	Pilot PSP (Payer)	N/A	**Optional** - the Pilot PSP debits the Payer's commercial bank money account for the funded amount (which may have been blocked earlier on the account). This step is required in case of reverse waterfall (i.e., not sufficient Beta Digital Euro on Payer side for this payment). *Step-specific business rules: TM-000-006*
TM-1.6.19	**Settlement confirmation notification**	Pilot PSP (Payee)	N/A and/or Payee Device	The Payee's Pilot PSP is notified of the settlement and sends confirmation of settlement to the SoftPOS Terminal. *Step-specific business rules: TM-000-006*
TM-1.6.20	**Displays settlement confirmation**	Payee Device	Business End-User (Payee)	The Payee Device displays the settlement confirmation to the Payee.
TM-1.6.21	**Settlement confirmation notified**	Business End-User (Payee)	N/A	The Payee is notified of the settlement.
TM-1.6.22	**Credits commercial bank money account**	Pilot PSP (Payee)	N/A	**Optional** - the Pilot PSP credits the commercial bank money account for the defunded amount. This step is required in case of waterfall (mandatory in case of a Business End-User, optional in case of an Individual End-User). *Step-specific business rules: LM-050-003, TM-000-006*

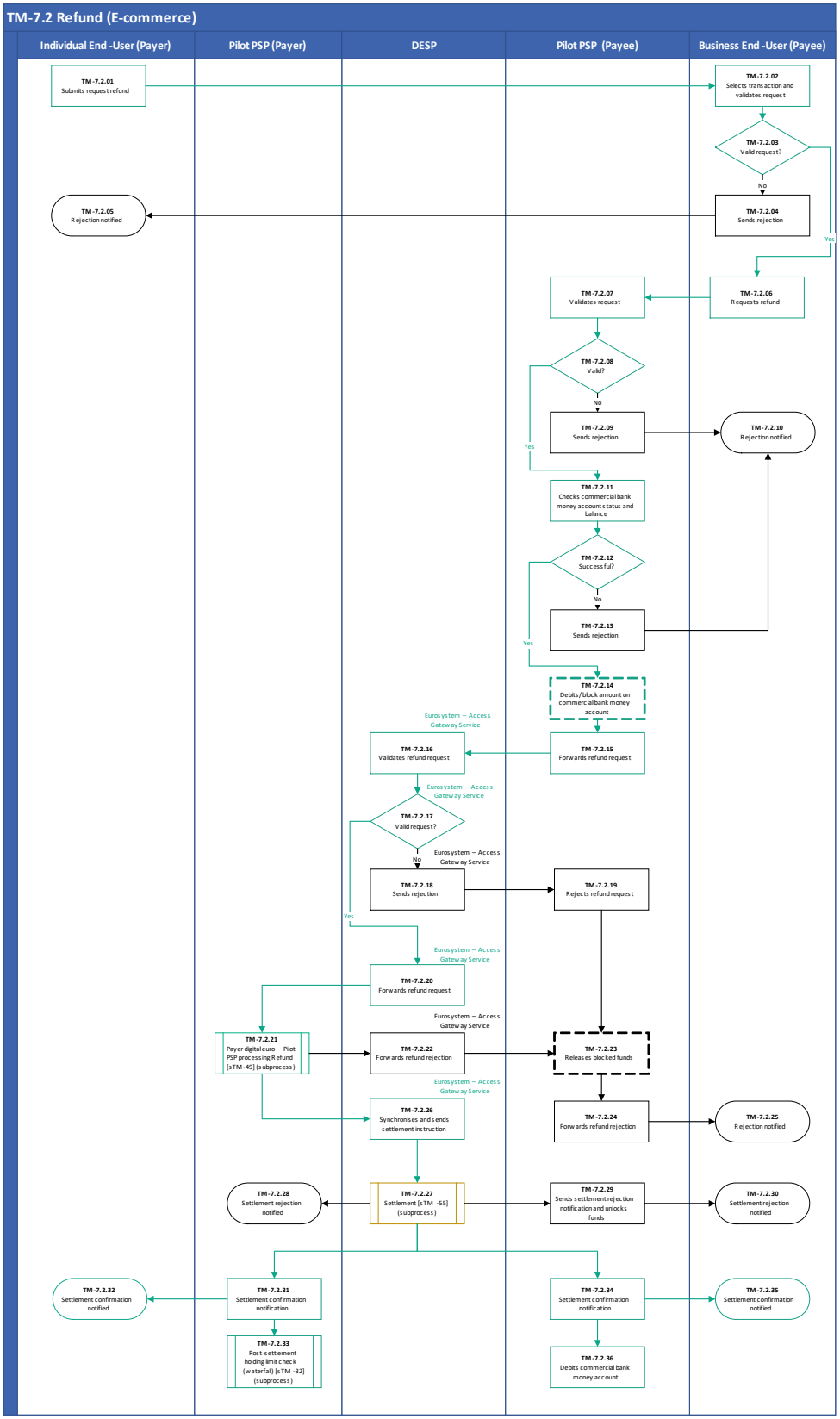
3.4 Refund by business

Digital euro Individual End-Users will be able to use a Beta Digital Euro in payment refunds.

Business refunds might be initiated online via the e-commerce website or app. In this case, the refund procedure might be initiated by the Individual or the Business End-User. Please note that for refund flows presented in this section the terminology Payer and Payee is swapped. The Business End-User (Payee) aims to pay the Individual End-User (Payer).

3.4.1 Refund for e-commerce payment

The following flow presents and depicts the steps characterising an online individual-initiated refund process following a general e-commerce payment.



TM-7.2 Refund (E-commerce)

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-7.2.01	**Submits request refund**	Individual End-User (Payer)	Business End-User (Payee)	**Optional** - the merchant may initiate the refund, e.g., if the product is out of stock. If the Payer had purchased physical goods, these would have to be returned (not displayed here).
TM-7.2.02	**Selects transaction and validates request**	Business End-User (Payee)	N/A	The Payee selects the transaction to be refunded and validates the refund request (including the refund amount). *Note: the Payee may hold a coded user details instead of the Payer's details. In that case a decoding step is required. In this flow it is assumed the Payee's Pilot PSP requests decoding upon receipt of the refund request (see below).*
TM-7.2.03	**Valid request?**	Business End-User (Payee)	N/A	If the request is not valid, the Payee rejects the request and informs the Payer. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
TM-7.2.04	**Sends rejection**	Business End-User (Payee)	Individual End-User (Payer)	The Payee rejects the request and sends a rejection message specifying the error type to the Payer.
TM-7.2.05	**Rejection notified**	Individual End-User (Payer)	N/A	The Payer is informed about the rejection and the rejection reason.
TM-7.2.06	**Request refund**	Business End-User (Payee)	Pilot PSP (Payee)	The Payee requests the Payee's PSP to process the refund transaction. Authentication for the Business End-User (Payee) takes place in this step, details will be discussed in a future version of the document.
TM-7.2.07	**Validates request**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP validates the refund request that should relate to an original Beta Digital Euro payment. *Step-specific business rules: TM-000-002, TM-062-001*
TM-7.2.08	**Valid?**	Pilot PSP (Payee)	N/A	If the refund request is invalid, the Pilot PSP sends the rejection to the Business End-User (Payee). *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.* *Step-specific business rules: TM-000-002, TM-062-001*
TM-7.2.09	**Sends rejection**	Pilot PSP (Payee)	Business End-User (Payee)	The Payee's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Payee. *Step-specific business rules: TM-000-003*

TM-7.2.10	**Rejection notified**	Business End-User (Payee)	N/A	The Business End-User (Payee) is notified of the rejection and the rejection reason.
TM-7.2.11	**Checks commercial bank money account status and balance**	Pilot PSP (Payee)	N/A	The Pilot PSP (Payee) checks the status of the Business End-User commercial bank money account and if its balance is sufficient to fund the Beta Digital Euro payment account as requested.
TM-7.2.12	**Successful?**	Pilot PSP (Payee)	N/A	If the commercial bank money account is inactive and/or its balance is insufficient, the operation is not executed.
TM-7.2.13	**Sends rejection**	Pilot PSP (Payee)	Business End-User (Payee)	The Payee's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Payee. *Step-specific business rules: TM-000-003*
TM-7.2.14	**Debits/block amount on commercial bank money account**	Pilot PSP (Payee)	N/A	Optional - The Payee's Pilot PSP blocks the funds on the merchant's commercial bank money account. Alternatively, the Pilot PSP debits the transaction amount from the merchant's commercial bank money account at this stage.
TM-7.2.15	**Forwards refund request**	Pilot PSP (Payee)	DESP	If the request is valid, Pilot PSP (Payee) indicates that reverse waterfall is required, includes funding details and forwards the request to the Eurosystem - Access Gateway Service. *Step-specific business rules: LM-030-002*
TM-7.2.16	**Validates refund request**	DESP	N/A	The Eurosystem - Access Gateway Service validates the refund request.
TM-7.2.17	**Valid request?**	DESP	N/A	If the refund request is invalid, the Eurosystem - Access Gateway Service sends the rejection to the PSP (Payee). *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
TM-7.2.18	**Sends rejection**	DESP	Pilot PSP (Payee)	The Eurosystem - Access Gateway Service rejects the request and sends a rejection message specifying the error type to the Payee's Pilot PSP.
TM-7.2.19	**Rejects refund request**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP rejects the refund request. *Step-specific business rules: TM-000-003*
TM-7.2.20	**Forwards refund request**	DESP	Pilot PSP (Payer)	The Eurosystem - Access Gateway Service forwards the refund request to the Payer's Pilot PSP.
TM-7.2.21	**Payer Pilot PSP processing Refund [sTM-49]**	Pilot PSP (Payer)	DESP	The Payer Pilot PSP initiates the Pilot PSP processing for a refund **[sTM-49].**

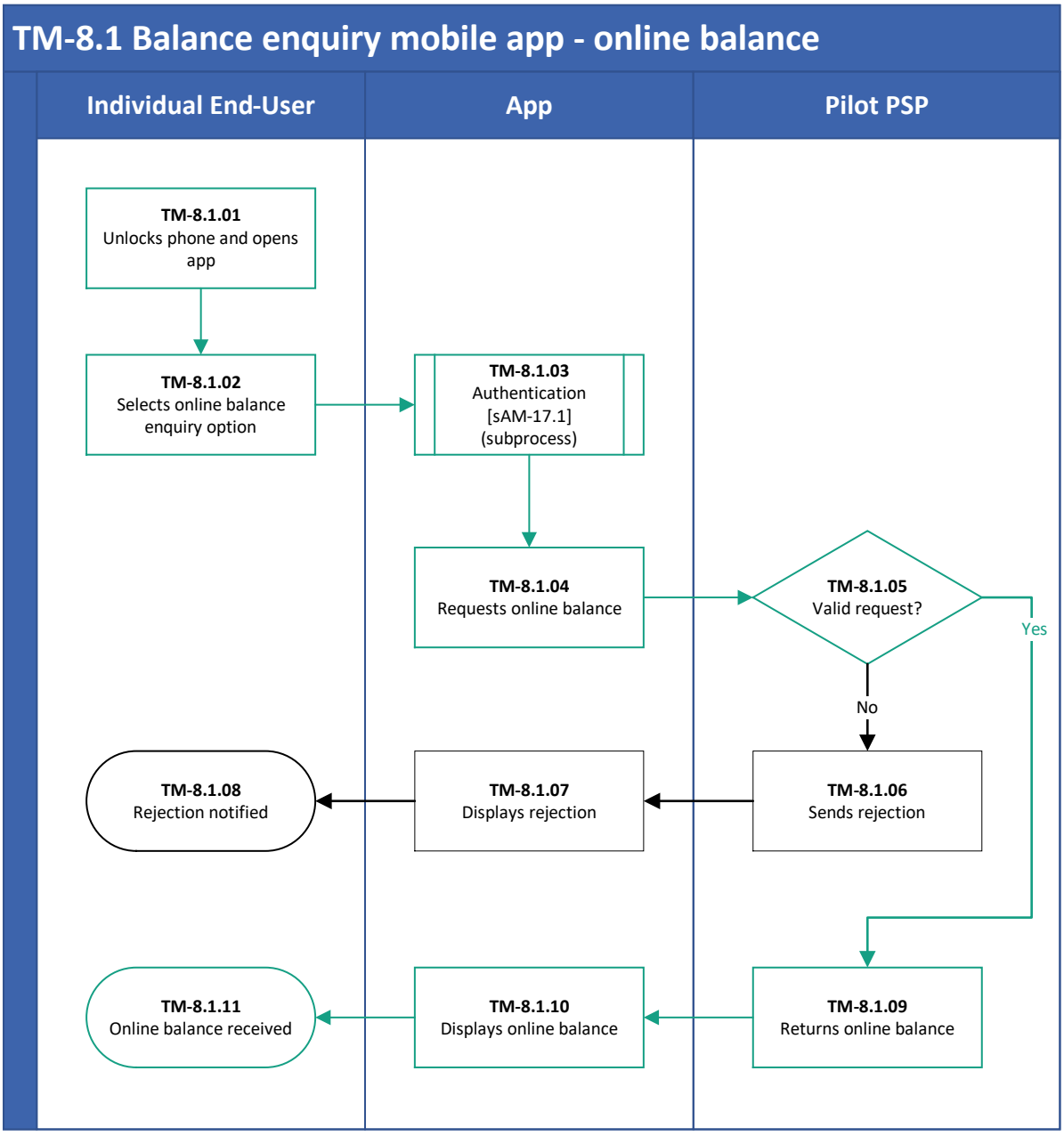
TM-7.2.22	**Forwards refund rejection**	DESP	Pilot PSP (Payee)	The Eurosystem - Access Gateway Service forwards the rejection of the refund request to the Pilot PSP (Payee).
TM-7.2.23	**Releases blocked funds**	Pilot PSP (Payee)	N/A	Optional - The Pilot PSP (Payee) releases the blocked funds in the Business End-User's commercial bank money account. Alternatively, the Pilot PSP credits the refund amount to the merchant's commercial bank money account at this stage. *Step-specific business rules: LM-030-003*
TM-7.2.24	**Forwards refund rejection**	Pilot PSP (Payee)	Business End-User (Payee)	The Pilot PSP (Payee) forwards the refund rejection and the rejection reason to the Business End-User (Payee). *Step-specific business rules: TM-000-003*
TM-7.2.25	**Rejection notified**	Business End-User (Payee)	N/A	The Business End-User is notified of the rejection and the rejection reason.
TM-7.2.26	**Synchronises and sends settlement instruction**	DESP	N/A	The Eurosystem - Access Gateway Service synchronises the request and sends the settlement instruction. In case of a refund, reverse waterfall is always required. The settlement instruction will include the funding amount.
TM-7.2.27	**Settlement [sTM-55]**	DESP	Pilot PSP (Payer) and/or Pilot PSP (Payee)	The DESP initiates the settlement **[sTM-55].**
TM-7.2.28	**Settlement rejection notified**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP is informed about the rejection and the rejection reason.
TM-7.2.29	**Sends settlement rejection notification and unlocks funds**	Pilot PSP (Payee)	Business End-User (Payee)	The Payee's Pilot PSP receives the settlement rejection notification and the rejection reason from the DESP and sends the rejection notification to the Payee. The Payee's Pilot PSP unlocks the funds, if previously locked, in the Payee's commercial bank money account or credits the Payee's commercial bank money account, if previously debited. *Step-specific business rules: LM-030-003, TM-000-003*
TM-7.2.30	**Settlement rejection notified**	Business End-User (Payee)	N/A	The Business End-User is informed about the rejection and the rejection reason.
TM-7.2.31	**Settlement confirmation notification**	Pilot PSP (Payer)	Individual End-User (Payer) and/or N/A	The Payer's Pilot PSP is notified of the settlement and sends confirmation of settlement to the Payer. *Step-specific business rules: TM-000-006*

TM-7.2.32	**Settlement confirmation notified**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the settlement.
TM-7.2.33	**Post-settlement holding limit check (waterfall) [sTM-32]**	PSP (Payer)	N/A	The subprocess of post-settlement holding limit check (waterfall) **[sTM-32]** is responsible for increasing the online balance and eventually crediting the Payer's commercial bank money account. *Note: this sub process is triggered post settlement to ensure that the holding limit is not exceeded in case of concurrent inbound payments.* An additional defunding step after settlement in case of incoming payment to Individual End-User is required to handle the following scenario: -Incoming transaction 1 is received. The check is performed to verify if it would result in a breach of the holding limit. This is not the case. Waterfall is not triggered. -Incoming transaction 2 is received. The check is performed to verify if it would result in a breach of the holding limit. This is not the case at this point in time. However, after settlement of incoming transaction 1, transaction 2 would breach the holding limit. Waterfall is not triggered by the standard validation. To ensure the holding limit, the additional waterfall step post settlement is performed.
TM-7.2.34	**Settlement confirmation notification**	Pilot PSP (Payee)	Business End-User (Payee) and/or N/A	The Pilot PSP (Payee) is notified of the settlement and sends confirmation of settlement to the Payee. *Step-specific business rules: TM-000-006*
TM-7.2.35	**Settlement confirmation notified**	Business End-User (Payee)	N/A	The Business End-User (Payee) is notified of the settlement.
TM-7.2.36	**Debits commercial bank money account**	Pilot PSP (Payee)	N/A	If the Payee's Pilot PSP has blocked the funds on the merchant's commercial bank money account, the reservation is replaced by a debit posting. If the Pilot PSP has debited the merchant's commercial bank money account earlier, this step is skipped. *Step-specific business rules: TM-000-006*

3.5 Balance enquiry and transaction history

3.5.1 Balance enquiry – online balance

Online balance enquiry can be done via mobile app (either Eurosystem-provided app or proprietary Pilot PSP app) installed on the Individual End-User's mobile device.

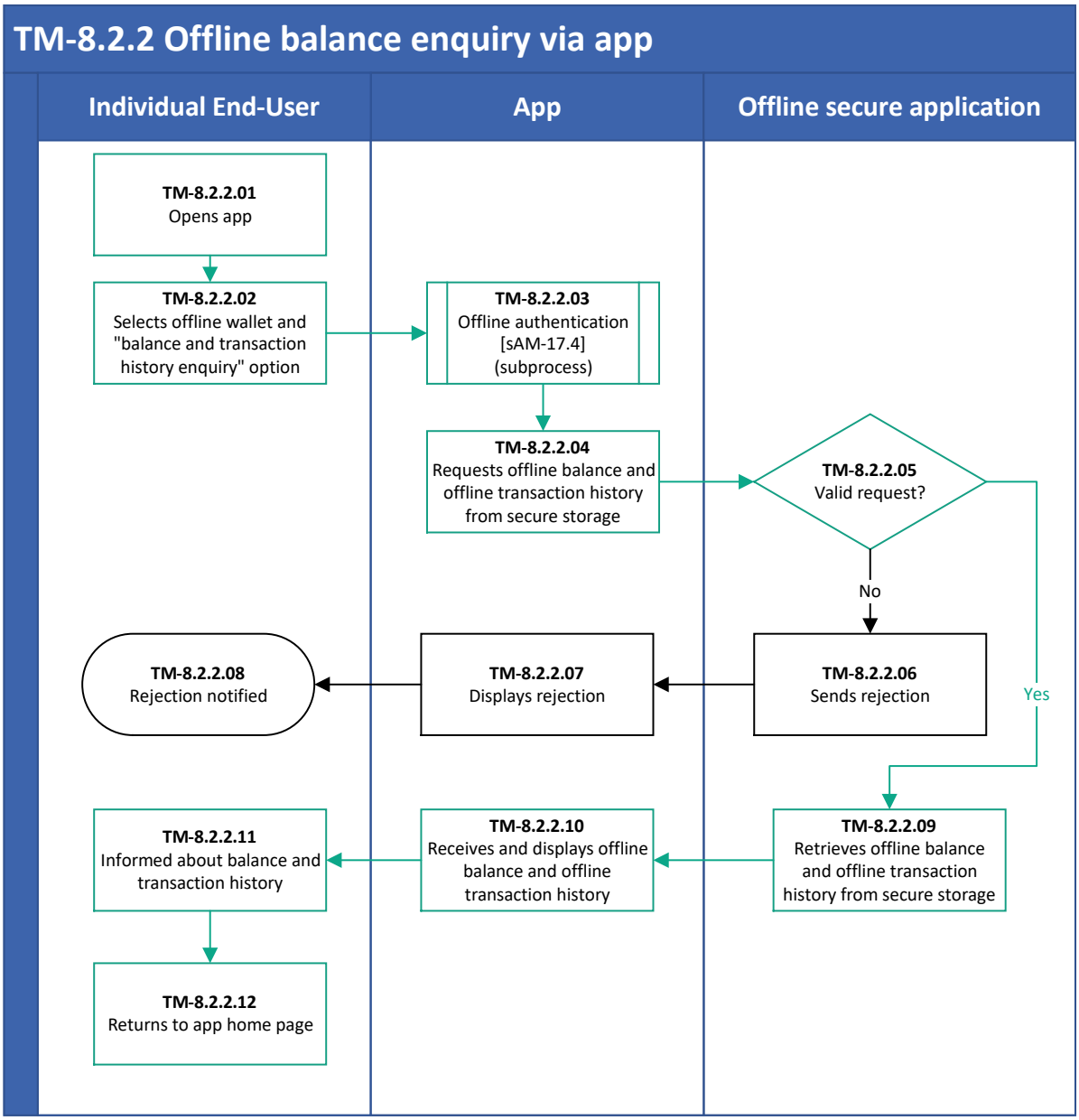


TM-8.1 Balance enquiry mobile app - online balance

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-8.1.01	**Unlocks phone and opens app**	Individual End-User	N/A	The Individual End-User unlocks their phone and opens the app.
TM-8.1.02	**Selects online balance enquiry option**	Individual End-User	App	The Individual End-User selects the online balance enquiry option from the menu.
TM-8.1.03	**Authentication [sAM-17.1]**	App	N/A	The app initiates the authentication **[sAM-17.1].**
TM-8.1.04	**Requests online balance**	App	Pilot PSP	If authentication is successful, the app requests to the Individual End-User's Pilot PSP the online balance of the Individual End-User. *Step-specific business rules: AM-020-002*
TM-8.1.05	**Valid request?**	Pilot PSP	N/A	If the request is not valid, the Pilot PSP rejects it. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
TM-8.1.06	**Sends rejection**	Pilot PSP	App	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the app.
TM-8.1.07	**Displays rejection**	App	Individual End-User	The app displays the rejection message with the rejection reason to the Individual End-User.
TM-8.1.08	**Rejection notified**	Individual End-User	N/A	The Individual End-User is notified of the rejection and the rejection reason (and may try again).
TM-8.1.09	**Returns online balance**	Pilot PSP	App	The Pilot PSP checks the online balance of the Individual End-User and returns the information to the user's app. *Step-specific business rules: AM-020-002*
TM-8.1.10	**Displays online balance**	App	Individual End-User	The app receives the online balance from the Individual End-User's Pilot PSP and displays the balance information to the Individual End-User. *Step-specific business rules: AM-020-002*
TM-8.1.11	**Online balance received**	Individual End-User	N/A	The Individual End-User receives the online balance.

3.5.2 Balance enquiry – offline balance

Offline balance enquiry can be done via mobile app (either Eurosystem-provided app or proprietary Pilot PSP app) installed on the Individual End-User's mobile device.



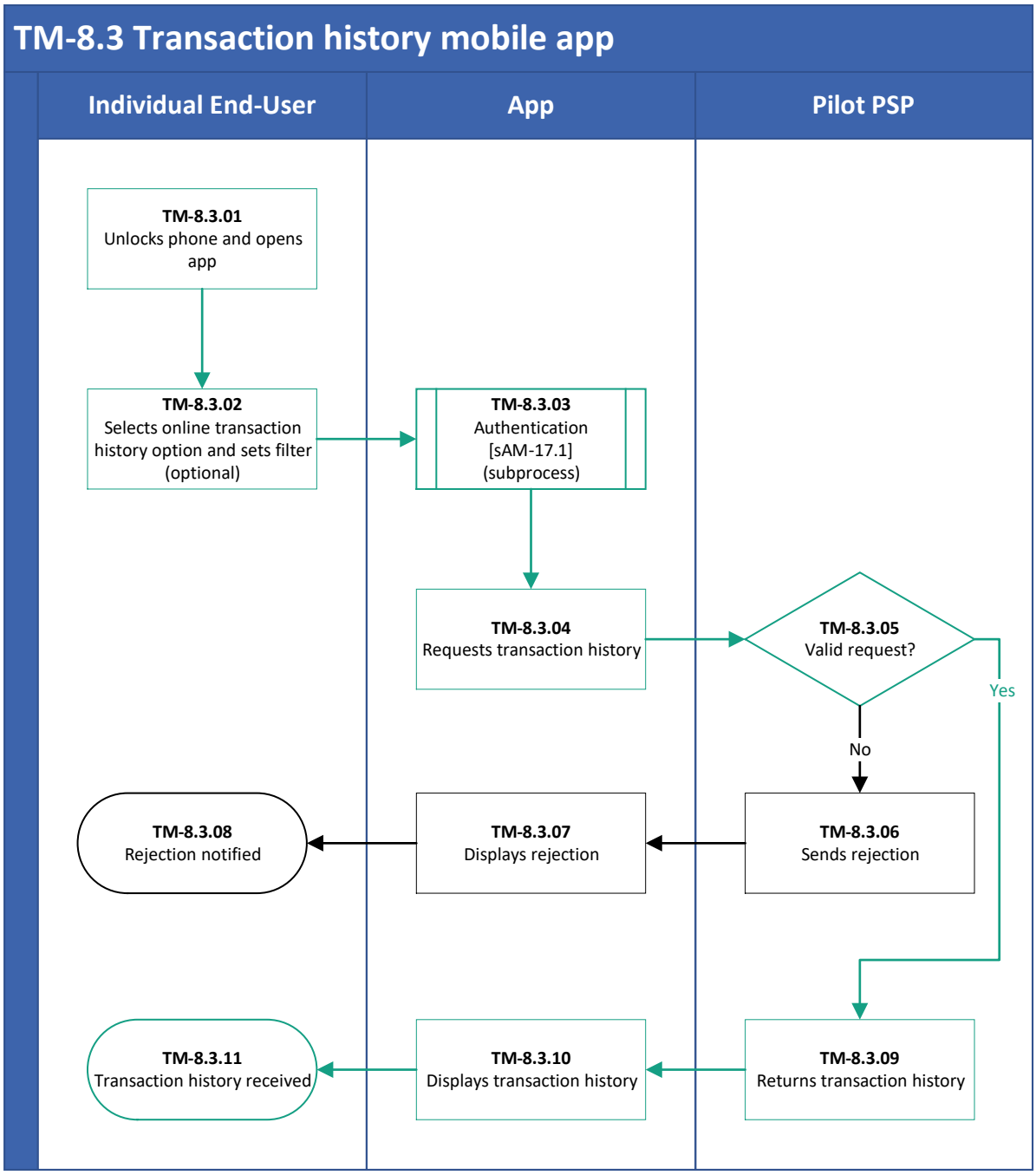
TM-8.2.2 Offline balance enquiry via app

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-8.2.2.01	**Opens app**	Individual End-User	N/A	The Individual End-User opens the app.
TM-8.2.2.02	**Selects offline wallet and "balance and transaction history enquiry" option**	Individual End-User	App	The Individual End-User selects the offline wallet, "balance and transaction enquiry" option in the app.
TM-8.2.2.03	**Offline authentication [sAM-17.4]**	App	N/A	The app initiates the offline authentication **[sAM-17.4].**

TM-8.2.2.04	**Requests offline balance and offline transaction history from secure storage**	App	Offline secure application	The app requests to the offline secure application the offline balance and offline transaction history of the Individual End-User. *Step-specific business rules: AM-020-002*
TM-8.2.2.05	**Valid request?**	Offline secure application	N/A	If the request is not valid, the offline secure application rejects it. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
TM-8.2.2.06	**Sends rejection**	Offline secure application	App	The offline secure application rejects the request and sends a rejection message specifying the error type to the app.
TM-8.2.2.07	**Displays rejection**	App	Individual End-User	The app displays the rejection message with the rejection reason to the Individual End-User.
TM-8.2.2.08	**Rejection notified**	Individual End-User	N/A	The Individual End-User is notified of the rejection and the rejection reason (and may try again).
TM-8.2.2.09	**Retrieves offline balance and offline transaction history from secure storage**	Offline secure application	App	The offline secure application retrieves the information about the offline balance and offline transaction history from the secure storage.
TM-8.2.2.10	**Receives and displays offline balance and offline transaction history**	App	Individual End-User	The app receives the offline balance and offline transaction history from the offline secure application and displays the information to the Individual End-User. *Step-specific business rules: AM-020-002*
TM-8.2.2.11	**Informed about balance and transaction history**	Individual End-User	N/A	The Individual End-User is informed about the offline balance and offline transaction history.
TM-8.2.2.12	**Returns to app home page**	Individual End-User	N/A	The Individual End-User returns the app home page.

3.5.3 Transaction history (online)

Online transaction history can be consulted via mobile app (either Eurosystem-provided app or proprietary Pilot PSP app) installed on the Individual End-User's mobile device.



TM-8.3 Transaction history mobile app

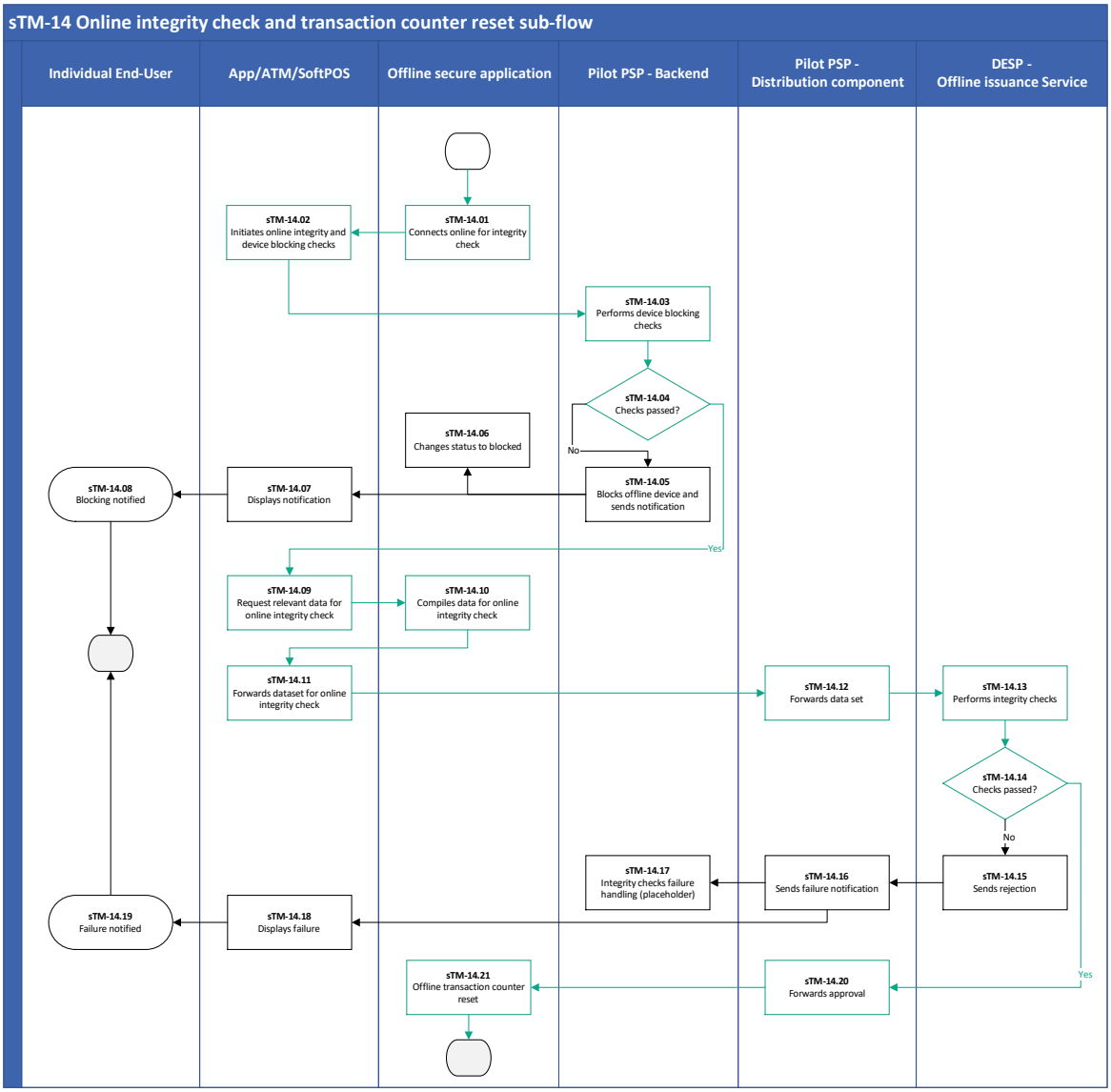
#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
TM-8.3.01	**Unlocks phone and opens app**	Individual End-User	N/A	The Individual End-User unlocks their phone and opens the app.
TM-8.3.02	**Selects online transaction history option**	Individual End-User	App	The Individual End-User selects the online transaction history option from the menu.

	and sets filter (optional)			
TM-8.3.03	**Authentication [sAM-17.1]**	App	N/A	The app initiates the authentication **[sAM-17.1**].
TM-8.3.04	**Requests transaction history**	App	Pilot PSP	If authentication is successful, the app requests to the Individual End-User's Pilot PSP the transaction history of the Individual End-User. *Step-specific business rules: AM-020-002*
TM-8.3.05	**Valid request?**	Pilot PSP	N/A	If the request is not valid, the Pilot PSP rejects it. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
TM-8.3.06	**Sends rejection**	Pilot PSP	App	The Pilot PSP rejects the request and sends a rejection message specifying the error type to the app.
TM-8.3.07	**Displays rejection**	App	Individual End-User	The app displays the rejection message with the rejection reason to the Individual End-User.
TM-8.3.08	**Rejection notified**	Individual End-User	N/A	The Individual End-User is notified of the rejection and the rejection reason (and may try again).
TM-8.3.09	**Returns transaction history**	Pilot PSP	App	The Pilot PSP retrieves the Individual End-User's transaction history information as per filter criteria and returns the information to the user's app. *Step-specific business rules: AM-020-002*
TM-8.3.10	**Displays transaction history**	App	Individual End-User	The app receives the transaction history from the Individual End-User's Pilot PSP and displays the transaction history information to the Individual End-User. *Step-specific business rules: AM-020-002*
TM-8.3.11	**Transaction history received**	Individual End-User	N/A	The Individual End-User receives the transaction history.

3.6 Transaction management sub-flows

3.6.1 Online integrity check

The integrity check process can be performed (i) via app (either Eurosystem-provided app or proprietary Pilot PSP app) or (ii) via SoftPOS.



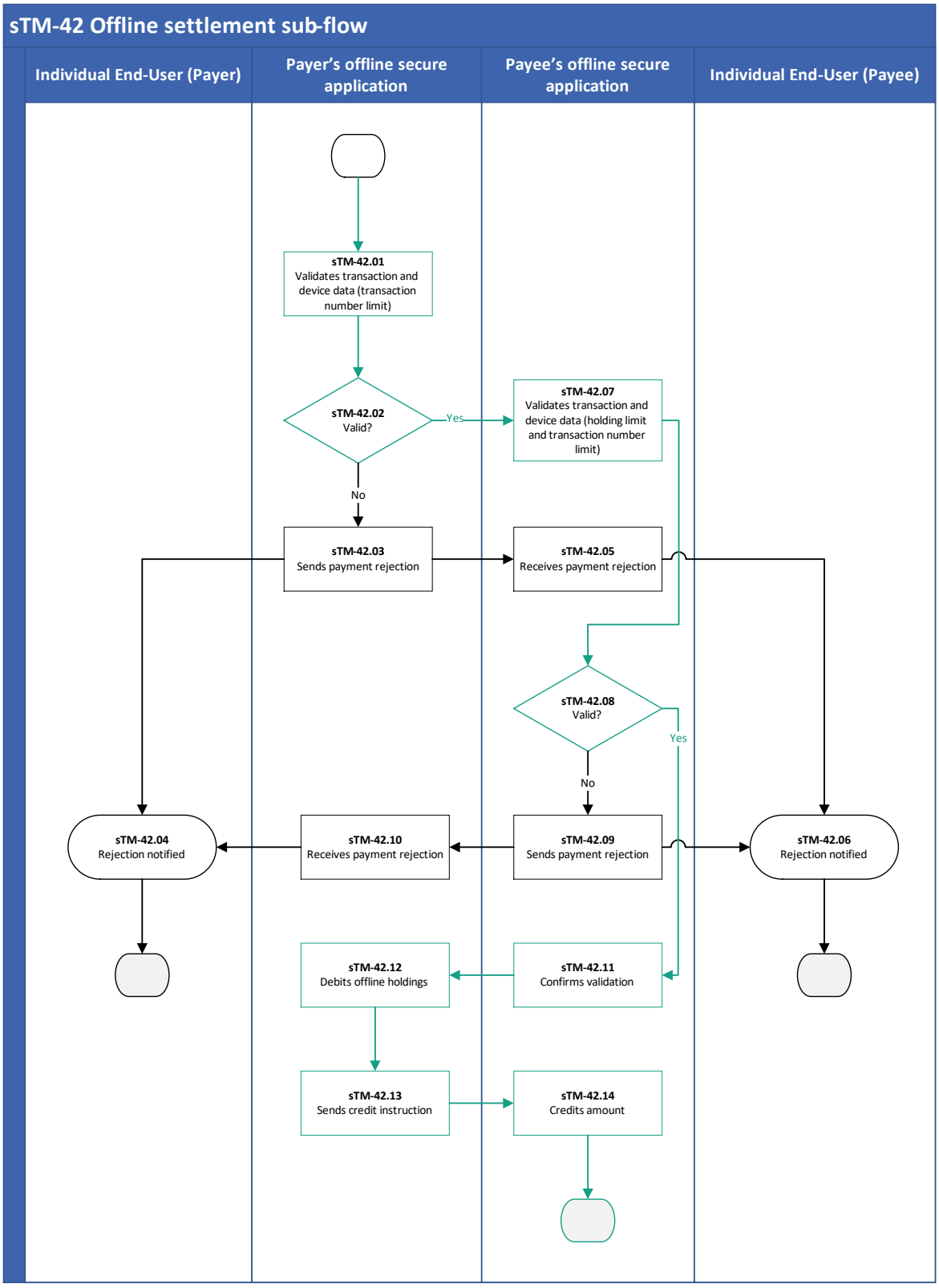
sTM-14 Online integrity check and transaction counter reset sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-14.01	**Connects online for integrity check**	Offline secure application	App/ SoftPOS	The offline secure application connects online via the app to initiate the integrity check process and reset the transaction counter.
sTM-14.02	**Initiates online integrity and device blocking checks**	App/ SoftPOS	Pilot PSP - Backend	The app initiates the online integrity and device blocking checks.
sTM-14.03	**Performs device blocking checks**	Pilot PSP - Backend	N/A	The Pilot PSP- Backend performs checks to determine if the device needs to be blocked e.g., against a list of stolen or blocked devices.

				Step-specific business rules: AM-021-021
sTM-14.04	**Checks passed?**	Pilot PSP - Backend	N/A and/or App /SoftPOS	If the device does not pass the integrity checks, it is blocked. *Step-specific business rules: AM-021-021*
sTM-14.05	**Blocks offline device and sends notification**	Pilot PSP - Backend	Offline secure application and/or App/SoftPOS	The Pilot PSP- Backend blocks the offline device and sends a notification to the offline secure application and the App, or SoftPOS. *Step-specific business rules: AM-021-021*
sTM-14.06	**Changes status to blocked**	Offline secure application	N/A	The offline secure application changes its status to blocked.
sTM-14.07	**Displays notification**	App/SoftPOS	Individual End-User	The app displays the blocking notification.
sTM-14.08	**Blocking notified**	Individual End-User	N/A	The Individual End-User is informed that the offline wallet is blocked for further use. Depending on the reasons, the user may contact the Pilot PSP to have it unblocked.
sTM-14.09	**Request relevant data for online integrity check**	App/SoftPOS	Offline secure application	The app requests the offline secure application for data for the online integrity check.
sTM-14.10	**Compiles data for online integrity check**	Offline secure application	App/ SoftPOS	The offline secure application compiles the data for the online integrity check and sends it to the app.
sTM-14.11	**Forwards dataset for online integrity check**	App/SoftPOS	Pilot PSP - Offline Distribution Component	The app forwards the data to the Pilot PSP (Offline Distribution Component).
sTM-14.12	**Forwards data set**	Pilot PSP - Offline Distribution Component	DESP - Offline Issuance Service	The Pilot PSP (Offline Distribution Component) forwards the data to the Offline Issuance Service.
sTM-14.13	**Performs integrity checks**	DESP - Offline Issuance Service	N/A	The Offline Issuance Service performs the integrity checks.
sTM-14.14	**Checks passed?**	DESP - Offline issuance Service	Pilot PSP - Offline Distribution component and/or N/A	If the data fails the check, the Offline Issuance Service sends a failure notification. If the data passes the check, the Offline Issuance Service sends an approval notification.
sTM-14.15	**Sends rejection**	DESP - Offline issuance Service	Pilot PSP - Offline Distribution component	The Offline issuance Service rejects the request and sends a rejection message specifying the error type to the Pilot PSP (Offline Distribution component).

sTM-14.16	**Sends failure notification**	Pilot PSP - Offline Distribution component	Pilot PSP - Backend and/or App/SoftPOS	The Pilot PSP (Offline Distribution component) sends a failure notification with the failure reason to the Pilot PSP (Backend) and the app or SoftPOS.
sTM-14.17	**Integrity checks failure handling**	Pilot PSP - Backend	N/A	The Pilot PSP (backend) will handle the failure deriving from the integrity checks.
sTM-14.18	**Displays failure**	App/ SoftPOS	Individual End-User	The app or SoftPOS displays the failure notification with the failure reason to the Individual End-User.
sTM-14.19	**Failure notified**	Individual End-User	N/A	The Individual End-User is informed of the failure and the reason of the failure.
sTM-14.20	**Forwards approval**	Pilot PSP - Offline Distribution component	Offline secure application	The Pilot PSP (Offline Distribution Component) receives the approval from the Offline issuance Service and forwards it to the offline secure application.
sTM-14.21	**Offline transaction counter reset**	Offline secure application	N/A	The offline secure application resets the counter to zero to allow for a new series of consecutive payments.

3.6.2 Offline settlement

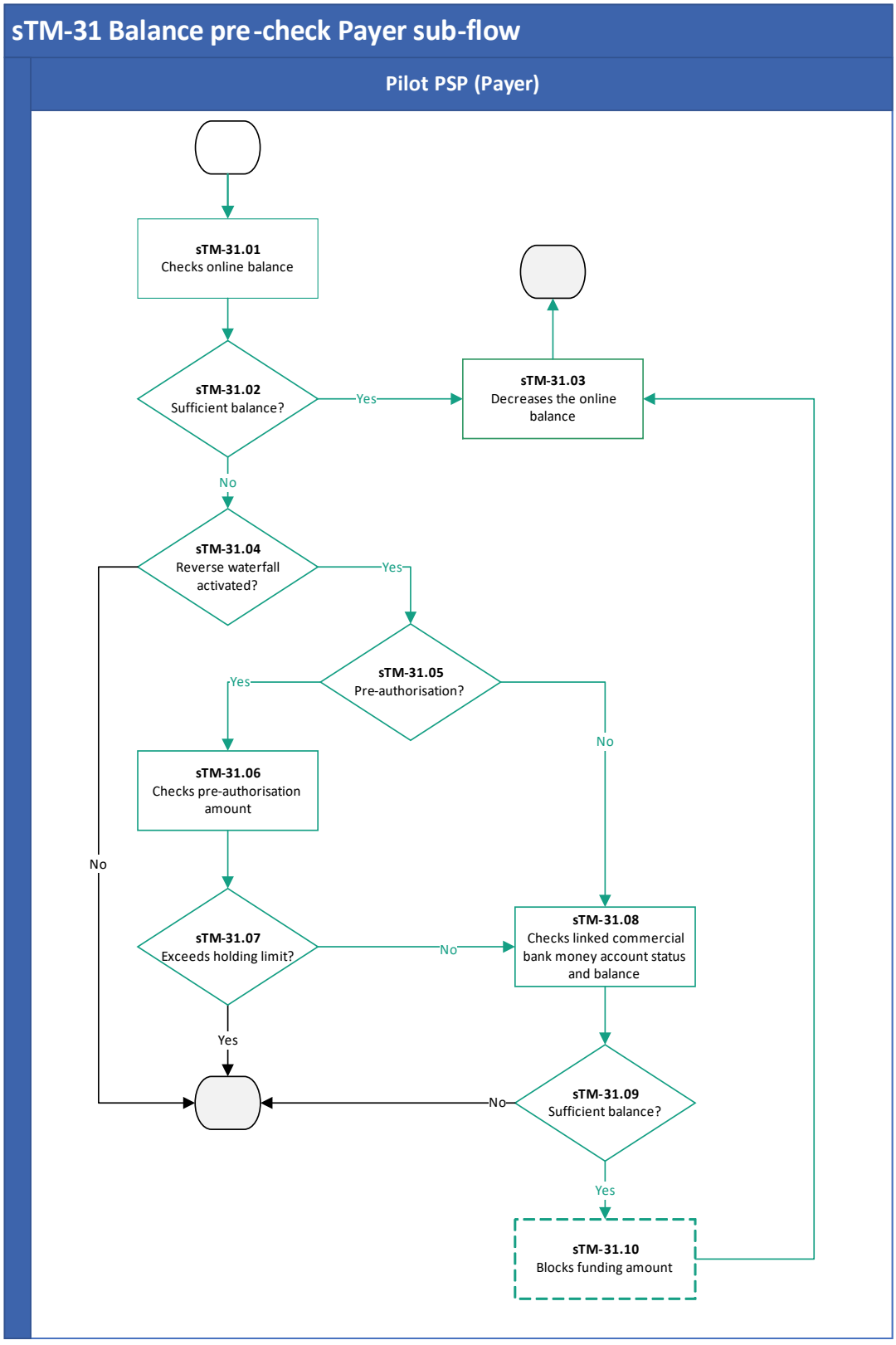


sTM-42 Offline settlement sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-42.01	**Validates transaction and device data (transaction number limit)**	Payer's offline secure application	N/A	The Payer's offline secure application validates the payment and checks if the payment would not exceed the transaction number limit (if not checked beforehand, if it's checked beforehand, there will be only a sufficient holding check).
sTM-42.02	**Valid?**	Payer's offline secure application	Payee's offline secure application and/or N/A	If the validation fails, the payment is rejected. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
sTM-42.03	**Sends payment rejection**	Payer's offline secure application	Individual End-User (Payer) and/or Payee's offline secure application	The offline secure application rejects the request and sends a rejection message specifying the error type to the Payee's offline secure application and the Payer.
sTM-42.04	**Rejection notified**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the rejection and the rejection reason.
sTM-42.05	**Receives payment rejection**	Payee's offline secure application	Individual End-User (Payee)	The offline secure application receives the payment rejection and the rejection reason and forwards it to the Payee.
sTM-42.06	**Rejection notified**	Individual End-User (Payee)	N/A	The Individual End-User (Payee) is notified of the rejection and the rejection reason.
sTM-42.07	**Validates transaction and device data (holding limit and transaction number limit)**	Payee's offline secure application	N/A	The Payee's offline secure application validates the payment and checks if the payment would not exceed the holding limit and transaction number limit (if not checked beforehand). *Step-specific business rules: LM-011-003*
sTM-42.08	**Valid?**	Payee's offline secure application	N/A	If the validation fails, the payment is rejected. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.* *Step-specific business rules: LM-011-003*
sTM-42.09	**Sends payment rejection**	Payee's offline secure application	Individual End-User (Payee) and/or Payer's offline secure application	The offline secure application rejects the request and sends a rejection message specifying the error type to the Payer's offline secure application and the Payee.
sTM-42.10	**Receives payment rejection**	Payer's offline secure application	Individual End-User (Payer)	The offline secure application receives the payment rejection and the rejection reason and forwards it to the Payer.
sTM-42.11	**Confirms validation**	Payee's offline secure application	Payer's offline secure application	The Payee's offline secure application confirms the validation to the Payer's offline secure application.
sTM-42.12	**Debits offline holdings**	Payer's offline secure application	N/A	The offline secure application debits the offline holdings for the defunded amount.

sTM-42.13	**Sends credit instruction**	Payer's offline secure application	Payee's offline secure application	The Payer's offline secure application sends an instruction to the Payee's offline secure application to increase the offline balance of the Payee.
sTM-42.14	**Credits amount**	Payee's offline secure application	N/A	The Payee's offline secure application increases the available balance with the transaction amount.

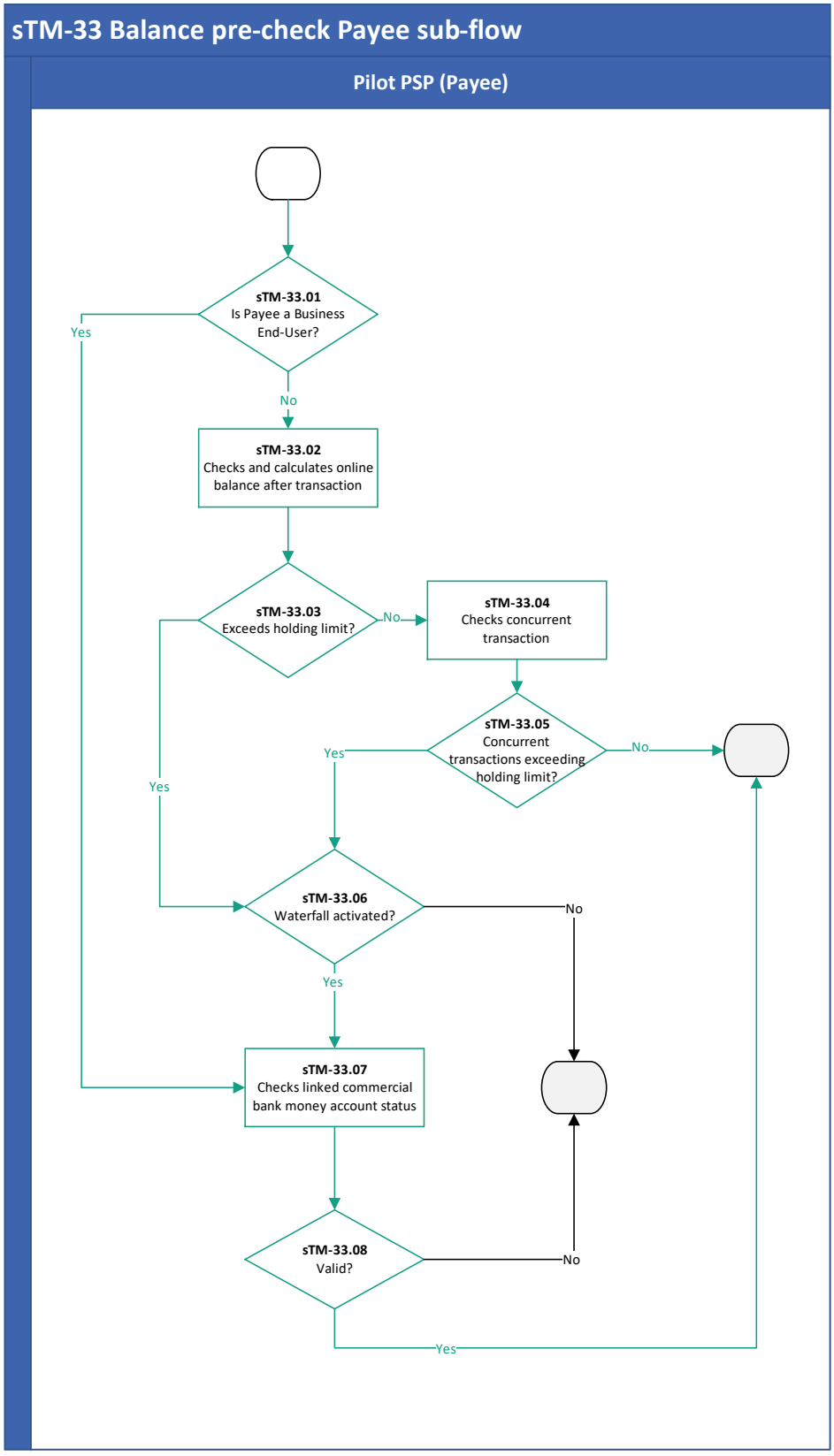
3.6.3 Balance pre-check on the Payer side



sTM-31 Balance pre-check Payer sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-31.01	**Checks online balance**	Pilot PSP (Payer)	N/A	The Pilot PSP checks if the user has sufficient funds to complete the transaction. *Step-specific business rules: TM-000-007*
sTM-31.02	**Sufficient balance?**	Pilot PSP (Payer)	N/A	If the user has sufficient funds, transaction processing continues. *Step-specific business rules: TM-000-007*
sTM-31.03	**Decreases the online balance**	Pilot PSP (Payer)	N/A	If the funds are sufficient, then the Payer's Pilot PSP decreases the online balance of the Individual End-User for the payment amount. In case the funds are not sufficient, the Pilot PSP decreases the online balance of the Individual End-User for the available funds.
sTM-31.04	**Reverse waterfall activated?**	Pilot PSP (Payer)	N/A	The Pilot PSP checks if the Individual End-User has configured the reversed waterfall option. If not, the transaction is rejected. *Step-specific business rules: TM-000-007*
sTM-31.05	**Pre-authorisation?**	Pilot PSP (Payer)	N/A	The Pilot PSP performs additional checks for pre-authorisation requests.
sTM-31.06	**Checks pre-authorisation amount**	Pilot PSP (Payer)	N/A	The Pilot PSP checks the pre-authorisation amount.
sTM-31.07	**Exceeds holding limit?**	Pilot PSP (Payer)	N/A	Pre-authorisation/reservation are possible for an amount up to the holding limit. If the amount exceeds the holding limit, the pre-authorisation request is rejected.
sTM-31.08	**Checks linked commercial bank money account status and balance**	Pilot PSP (Payer)	N/A	The Pilot PSP checks if the linked account is in a valid state and if the user has sufficient funds in commercial bank money on the linked account to complete the transaction.
sTM-31.09	**Sufficient balance?**	Pilot PSP Payer)	N/A	If the Individual End-User's commercial bank money account does not hold sufficient funds to complete the insufficient online funds, the transaction is rejected.
sTM-31.10	**Blocks funding amount**	Pilot PSP (Payer)	N/A	Optional - The Pilot PSP blocks the required funds on the Individual End-User's commercial bank money account.

3.6.4 Balance pre-check on the Payee side



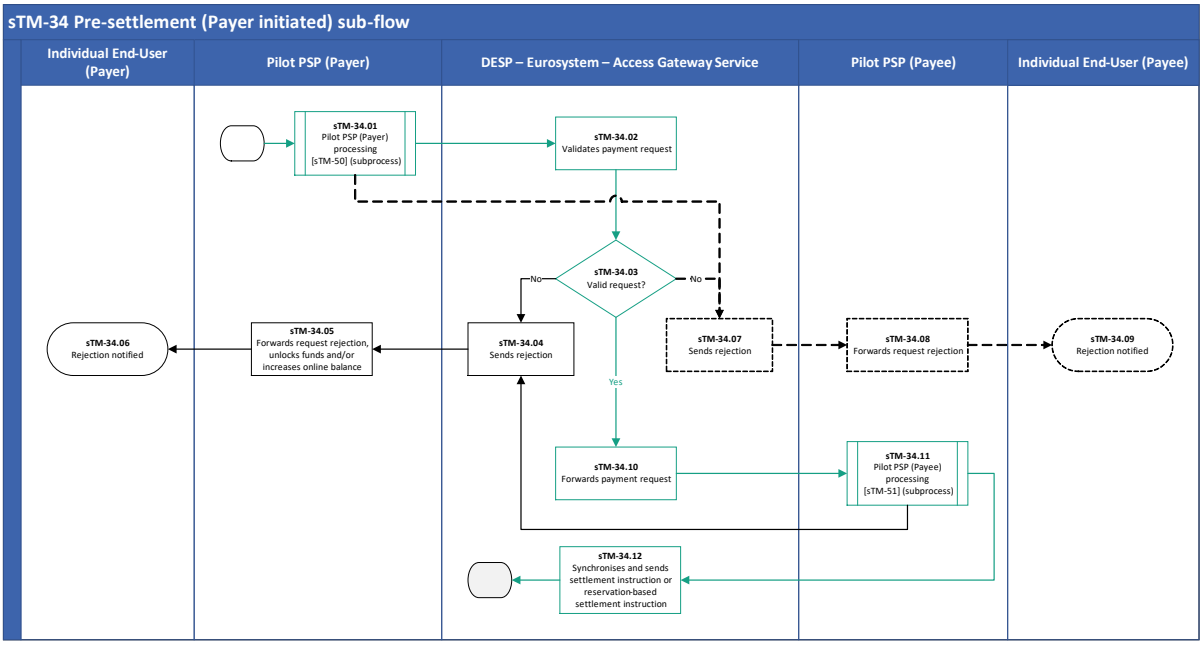
sTM-33 Balance pre-check Payee sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-33.01	**Is Payee a Business End-User?**	Pilot PSP (Payee)	N/A	If the Payee is a Business End-User, the Pilot PSP can directly pre-check the linked commercial bank money account status of the Payee. If not, it must calculate the balance after the transaction to see if it exceeds the holding limit. *Step-specific business rules: LM-012-001*
sTM-33.02	**Checks and calculates online balance after transaction**	Pilot PSP (Payee)	N/A	The Pilot PSP checks if the Payee will exceed the holding limit when the transaction is completed and calculates the forecast balance (including the current transaction) to check if it exceeds the holding limit. *Step-specific business rules: TM-001-001, TM-061-001*
sTM-33.03	**Exceeds holding limit?**	Pilot PSP (Payee)	N/A	If the forecast balance exceeds the holding limit, the Pilot PSP checks if waterfall is activated. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002, TM-001-001, TM-061-001*
sTM-33.04	**Checks concurrent transaction**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP checks if the transaction being processed is part of a set of concurrent transactions. That is, the Pilot PSP checks if other transaction(s) is/are still being processed (not settled or rejected). *Step-specific business rules: TM-061-001*
sTM-33.05	**Concurrent transactions exceeding holding limit?**	Pilot PSP (Payee)	N/A	In case of concurrent transactions, the Pilot PSP checks whether the sum of the online balance and all of these transactions (including the one in process) exceed the holding limit. If so, the incoming transaction can only be processed if the Payee has activated the waterfall functionality. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002, TM-001-001, TM-061-001*
sTM-33.06	**Waterfall activated?**	Pilot PSP (Payee)	N/A	The Pilot PSP checks if the user has configured the waterfall option. If not, the transaction is rejected, and the rejection is forwarded to the Individual End-User. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002, TM-001-001, TM-001-002, TM-061-001*
sTM-33.07	**Checks linked commercial bank money account status**	Pilot PSP (Payee)	N/A	The Pilot PSP checks if the linked account is in a valid state. *Step-specific business rules: LM-010-001, TM-001-001, TM-001-002*
sTM-33.08	**Valid?**	Pilot PSP (Payee)	N/A	If the Individual End-User's commercial bank money account is not valid, the transaction is rejected. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.* *Step-specific business rules: TM-001-001*

3.6.5 Pre-settlement

The sub-processes characterising the pre-settlement phase of a payment when initiated by the Payer or by the Payee, are presented and depicted in the flows down below.

Same Pilot PSP: two Pilot PSPs involved, one for the Payer and one for the Payee, no open funding.



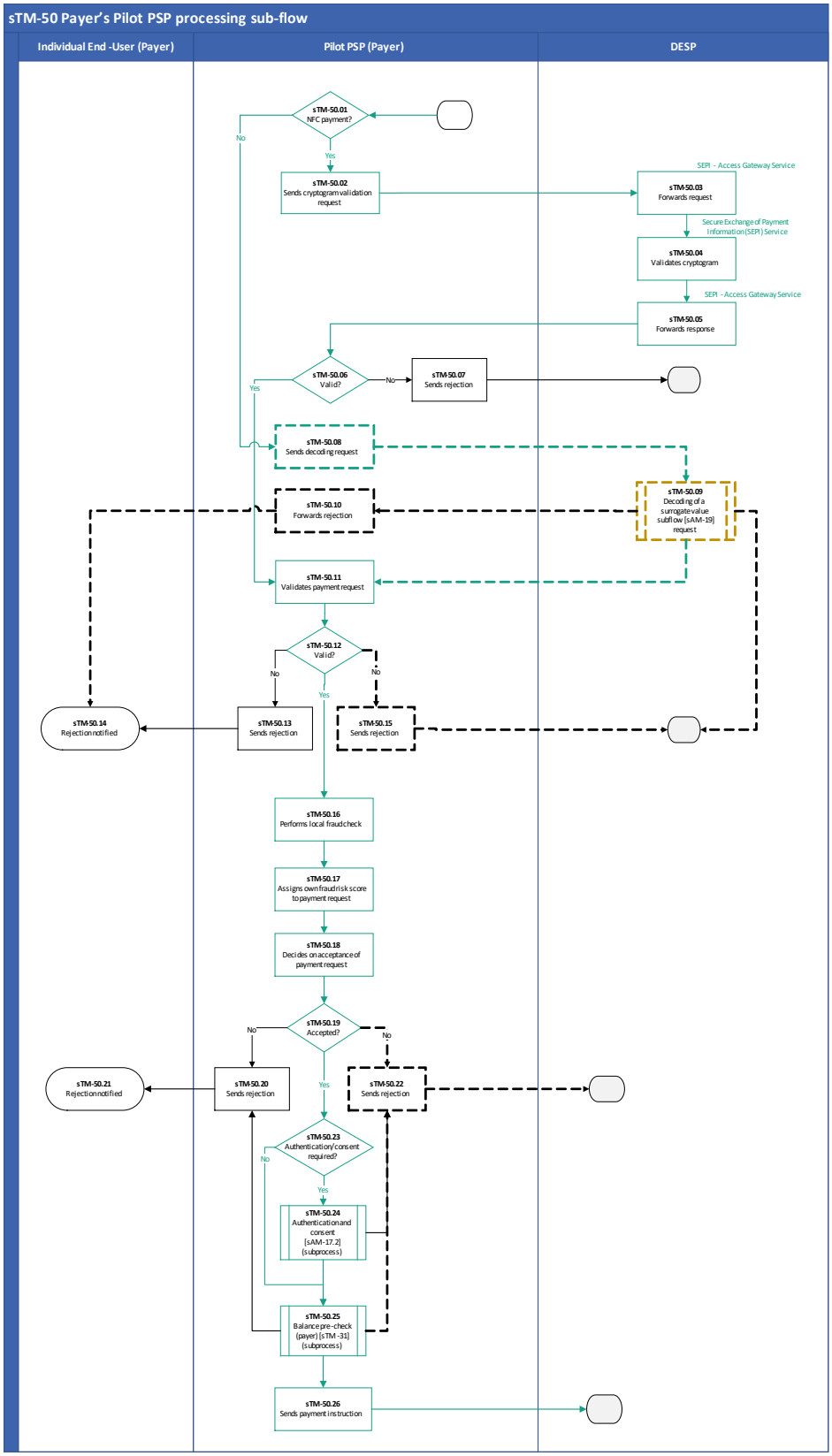
sTM-34 Pre-settlement (Payer initiated) sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-34.01	**Payer's Pilot PSP processing [sTM-50]**	Pilot PSP (Payer)	DESP – Eurosystem - Access Gateway Service	The subprocess of Payer's Pilot PSP processing **[sTM-50].**
sTM-34.02	**Validates payment request**	DESP – Eurosystem - Access Gateway Service	N/A	The Eurosystem - Access Gateway Service validates the payment request.
sTM-34.03	**Valid request?**	DESP – Eurosystem - Access Gateway Service	N/A	If validation is not successful, the payment is rejected. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*
sTM-34.04	**Sends rejection**	DESP – Eurosystem - Access Gateway Service	Pilot PSP (Payer)	The Eurosystem - Access Gateway Service rejects the request and sends a rejection message specifying the error type to the Payer's Pilot PSP.

sTM-34.05	**Forwards request rejection, unlocks funds and/or increases online balance**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP forwards the payment request rejection and the rejection reason to the Payer. The Pilot PSP also increases the online balance of the Payer if previously decreased and unlocks the funds, if previously locked, in the Payer's commercial bank money account. *Step-specific business rules: LM-030-003, TM-000-003*
sTM-34.06	**Rejection notified**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the rejection and the rejection reason.
sTM-34.07	**Sends rejection**	DESP – Eurosystem - Access Gateway Service	Pilot PSP (Payee)	**Optional** - (only for those Prioritised Use Cases where the Payee's Pilot PSP has been previously involved): The Eurosystem - Access Gateway Service rejects the request and sends a rejection message specifying the error type to the Payee's Pilot PSP.
sTM-34.08	**Forwards request rejection**	Pilot PSP (Payee)	Individual End-User (Payee)	**Optional** - (only for those Prioritised Use Cases where the Payee's Pilot PSP has been previously involved): The Payee's Pilot PSP forwards the payment request rejection and the rejection reason to the Payee. *Step-specific business rules: TM-000-003*
sTM-34.09	**Rejection notified**	Individual End-User (Payee)	N/A	**Optional** - (only for those Prioritised Use Cases where the Payee's Pilot PSP has been previously involved): The Individual End-User (Payee) is notified of the rejection and the rejection reason.
sTM-34.10	**Forwards payment request**	DESP – Eurosystem - Access Gateway Service	Pilot PSP (Payee)	The Eurosystem - Access Gateway Service forwards the payment request to the Payee's Pilot PSP.
sTM-34.11	**Pilot PSP (Payee) processing [sTM-51]**	Pilot PSP (Payee)	DESP – Eurosystem - Access Gateway Service	The subprocess of Payee's Pilot PSP processing **[sTM-51].**
sTM-34.12	**Synchronises and sends settlement instruction or reservation-based settlement instruction**	DESP – Eurosystem - Access Gateway Service	N/A	The Eurosystem - Access Gateway Service synchronises the request and sends the settlement instruction (of a combined transaction). The settlement instruction based on reservation includes the amount to be settled and optionally the amount to be released. The settlement may be for only a part of the total reservation amount and may be part of a series (multiple partial captures). In case it is the last of the series it would be indicated the possible remaining reserved amount to be released.

3.6.6 Pilot PSP processing

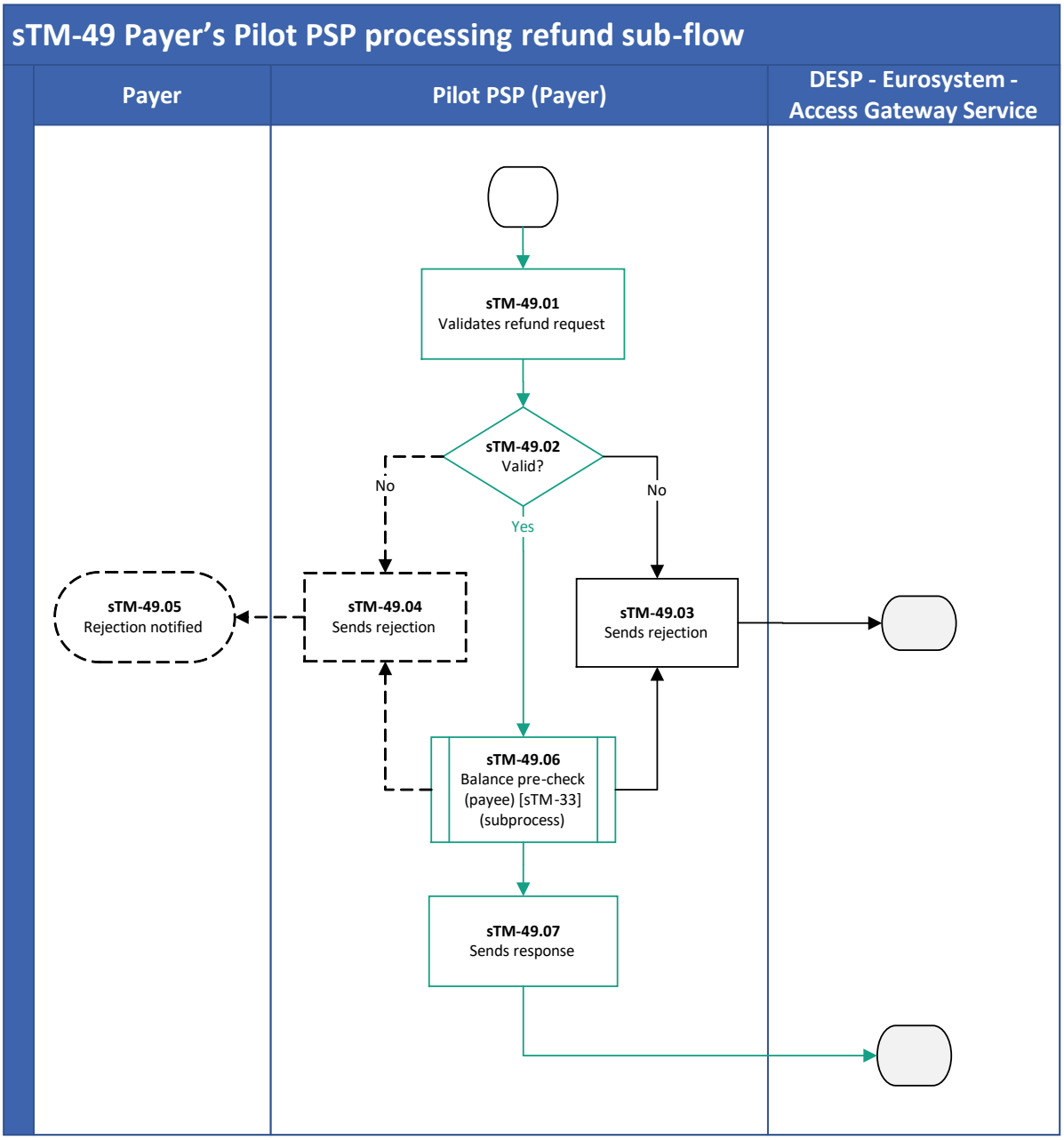
The sub-processes characterising the payment request processing, during the pre-settlement phase, from the Pilot PSP(s) of the Payer (one or multiple) and the Payee (one or multiple) are presented and depicted in the flows down below.



sTM-50 Payer's Pilot PSP processing sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-50.01	**NFC payment?**	Pilot PSP (Payer)	N/A	In case of an NFC payment, the cryptogram needs to be validated.
sTM-50.02	**Sends cryptogram validation request**	Pilot PSP (Payer)	DESP	The Payer's Pilot PSP sends a cryptogram validation request to the DESP.
sTM-50.03	**Forwards request**	DESP	N/A	The Access Gateway of the Secure Exchange of Payment Information (SEPI) component forwards the validation request to the Service.
sTM-50.04	**Validates cryptogram**	DESP	N/A	The Secure Exchange of Payment Information (SEPI) Service recalculates the application cryptogram and sends the response to the Eurosystem - Access Gateway Service.
sTM-50.05	**Forwards response**	DESP	Pilot PSP (Payer)	The SEPI - Access Gateway Service forwards the result of the validation to the requesting Pilot PSP.
sTM-50.06	**Valid?**	Pilot PSP (Payer)	N/A	If the cryptogram is not valid, the Payer's Pilot PSP rejects the request.
sTM-50.07	**Sends rejection**	Pilot PSP (Payer)	DESP	The Payer's Pilot PSP rejects the request and sends a rejection message specifying the error type to the DESP.
sTM-50.08	**Sends decoding request**	Pilot PSP (Payer)	DESP	**Optional** - If the payment request contains a surrogate value, the Payer's Pilot PSP requests DESP to decode it.
sTM-50.09	**Decoding of a surrogate value sub-flow request [sAM-19]**	DESP	Pilot PSP (Payer) and/or N/A	**Optional** - The DESP performs decoding of a surrogate value sub-flow request **[sAM-19]**. If the decoding is not successful, the DESP rejects the payment request.
sTM-50.10	**Forwards rejection**	Pilot PSP (Payer)	Individual End-User (Payer)	**Optional** - The Payer's Pilot PSP forwards the rejection message specifying the error type to the Payer.
sTM-50.11	**Validates payment request**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP validates the payment request.
sTM-50.12	**Valid?**	Pilot PSP (Payer)	N/A	If the request is not valid, the Payer's Pilot PSP rejects the payment request and sends information to the DESP and the Payer. *Step-specific business rules: TM-000-002*
sTM-50.13	**Sends rejection**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Payer. *Step-specific business rules: TM-000-003*
sTM-50.14	**Rejection notified**	Individual End-User	N/A	**Optional** - The Individual End-User (Payer) is notified of the rejection and the rejection reason.
sTM-50.15	**Sends rejection**	Pilot PSP (Payer)	DESP	**Optional** - (performed if Payee's Pilot PSP previously involved): The Payer's Pilot PSP rejects the request and sends a rejection message specifying the error type to the DESP.
sTM-50.16	**Performs local fraud check**	Pilot PSP (Payer)	N/A	The Payer' Pilot PSP performs fraud check based on its own models.
sTM-50.17	**Assigns own fraud risk score to payment request**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP assigns fraud risk score to payment request.

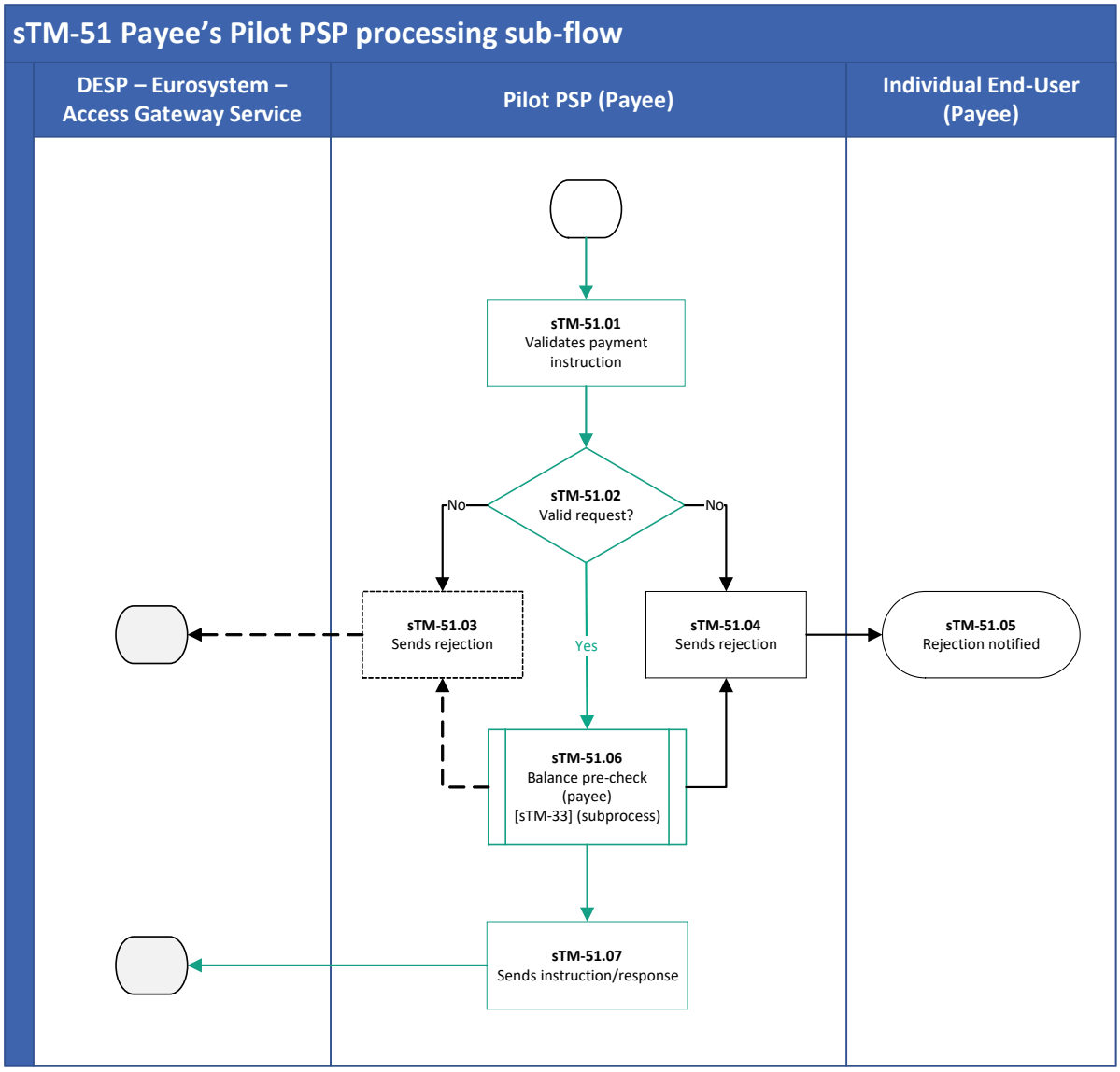
sTM-50.18	**Decides on acceptance of payment request**	Pilot PSP (Payer)	N/A	Based on the assigned risk score, the Payer's Pilot PSP decides whether to accept or not the payment request. *Step-specific business rules: TM-000-010*
sTM-50.19	**Accepted?**	Pilot PSP (Payer)	N/A	If the request is not accepted, the Payer's Pilot PSP rejects the payment request and sends information to the DESP and the Payer. *Step-specific business rules: TM-000-010*
sTM-50.20	**Sends rejection**	Pilot PSP (Payer)	Individual End-User (Payer)	The Payer's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Payer. *Step-specific business rules: TM-000-003*
sTM-50.21	**Rejection notified**	Individual End-User (Payer)	N/A	The Individual End-User (Payer) is notified of the rejection and the rejection reason.
sTM-50.22	**Sends rejection**	Pilot PSP (Payer)	DESP	**Optional** - (performed if Payee's Pilot PSP previously involved): The Payer's Pilot PSP rejects the request and sends a rejection message specifying the error type to the DESP.
sTM-50.23	**Authentication/ consent required?**	Pilot PSP (Payer)	N/A	After the fraud check, the Payer's PSP checks or decides whether the authentication and consent steps are necessary.
sTM-50.24	**Authentication and consent [sAM-17.2]**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP performs subprocess of authentication and consent **[sAM-17.2].** If the authentication and confirmation are not successful, the Payer's Pilot PSP rejects the payment.
sTM-50.25	**Balance pre-check (payer) [sTM-31]**	Pilot PSP (Payer)	N/A	The subprocess of balance pre-check for the Payer **[sTM-31].** *Step-specific business rules: LM-030-002*
sTM-50.26	**Sends payment instruction**	Pilot PSP (Payer)	DESP	The Payer's Pilot PSP sends the payment instruction to the DESP. *Step-specific business rules: LM-030-002*



sTM-49 Payer's Pilot PSP processing refund sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-49.01	**Validates refund request**	Pilot PSP (Payer)	N/A	The Payer's Pilot PSP validates the refund request, including the existence of the original transaction to be refunded. *Step-specific business rules: TM-000-002, TM-000-010*
sTM-49.02	**Valid?**	Pilot PSP (Payer)	N/A	If the request is not valid, the Payer's Pilot PSP rejects the refund request and sends information to the DESP. *Step-specific business rules: TM-000-002, TM-000-010*

sTM-49.03	**Sends rejection**	Pilot PSP (Payer)	DESP - Eurosystem - Access Gateway Service	The Payer's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Eurosystem - Access Gateway Service. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002, TM-001-002*
sTM-49.04	**Sends rejection**	Pilot PSP (Payer)	Payer	**Optional** - (performed if Payer's previously involved): The Payer's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Payer. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002, TM-000-003, TM-001-002*
sTM-49.05	**Rejection notified**	Payer	N/A	**Optional** - (performed if Payer's previously involved): The Payer is informed about the rejection and the rejection reason.
sTM-49.06	**Balance pre-check (payee) [sTM-33]**	Pilot PSP (Payer)	N/A	The subprocess of balance pre-check for the Payee **[sTM-33].** Note that the **Payer of the original transaction is the Payee of the refund**, so the Payee balance check needs to be executed to ensure the user's holding limit is not exceeded. *Step-specific business rules: LM-050-002*
sTM-49.07	**Sends response**	Pilot PSP (Payer)	DESP - Eurosystem - Access Gateway Service	The Payer's Pilot PSP sends the response to Eurosystem - Access Gateway Service. *Step-specific business rules: LM-050-002*



sTM-51 Payee's Pilot PSP processing sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-51.01	**Validates payment instruction**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP validates the payment instruction. *Step-specific business rules: TM-000-002*
sTM-51.02	**Valid request?**	Pilot PSP (Payee)	N/A	If the instruction is not valid, the Payee's Pilot PSP rejects it and notifies the Eurosystem - Access Gateway Service and the Payee about the rejection and the rejection reason. Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules. *Step-specific business rules: TM-000-002*

sTM-51.03	**Sends rejection**	Pilot PSP (Payee)	DESP - Eurosystem - Access Gateway Service	**Optional** - (performed if Payer's Pilot PSP previously involved): The Payee's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Eurosystem - Access Gateway Service. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002, TM-001-002*
sTM-51.04	**Sends rejection**	Pilot PSP (Payee)	Individual End-User (Payee)	The Payee's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Payee. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002, TM-001-002*
sTM-51.05	**Rejection notified**	Individual End-User (Payee)	N/A	The Individual End-User (Payee) is notified of the rejection and the rejection reason.
sTM-51.06	**Balance pre-check (payee) [sTM-33]**	Pilot PSP (Payee)	N/A	The subprocess of balance pre-check for the Payee **[sTM-33].** *Step-specific business rules: LM-050-002*
sTM-51.07	**Sends instruction/response**	Pilot PSP (Payee)	DESP – Eurosystem - Access Gateway Service	The Payee's Pilot PSP sends the instruction or response (depending on the situation, in the case of a Payer-initiated transaction it may be a response) to the Eurosystem - Access Gateway Service. In case waterfall is required, the payment instruction will include the defunding amount. *Step-specific business rules: LM-050-002, TM-002-001*

~~**sTM-52 Payer's Pilot PSP processing sub-flow**~~

~~#Step~~	~~Step name~~	~~Initiating actor(s)~~	~~Receiving actor(s)~~	~~Definition~~
~~sTM-52.01~~	~~**Validates request**~~	~~Pilot PSP (Payer)~~	~~N/A~~	~~The Payer's Pilot PSP validates the funding request.~~
~~sTM-52.02~~	~~**Valid?**~~	~~Pilot PSP (Payer)~~	~~N/A~~	~~If validation is not successful, the request is rejected.~~ ~~*Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.*~~
~~sTM-52.03~~	~~**Sends rejection**~~	~~Pilot PSP (Payer)~~	~~DESP – Eurosystem - Access Gateway Service~~	~~The Payer's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Eurosystem - Access Gateway Service.~~
~~sTM-52.04~~	~~**Checks commercial bank money account status and balance**~~	~~Pilot PSP (Payer)~~	~~N/A~~	~~The Payer's Pilot PSP checks if the linked account is in a valid status and has sufficient balance to execute the transaction.~~ ~~*Step-specific business rules: TM-000-007*~~
~~sTM-52.05~~	~~**Successful?**~~	~~Pilot PSP (Payer)~~	~~N/A~~	~~If the check is not successful, the request is rejected.~~

				Step-specific business rules: TM-000-007
sTM-52.06	**Sends rejection**	Pilot PSP (Payer)	DESP – Eurosystem - Access Gateway Service	The Payer's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Eurosystem – Access Gateway Service.
sTM-52.07	**Blocks funds on commercial bank money account**	Pilot PSP (Payer)	N/A	The Pilot PSP blocks the required funds on the Individual End-User's commercial bank money account.
sTM-52.08	**Sends confirmation and settlement details**	Pilot PSP (Payer)	DESP - Eurosystem - Access Gateway Service	The Pilot PSP sends the confirmation and required settlement details for the funding transaction to the Eurosystem - Access Gateway Service.

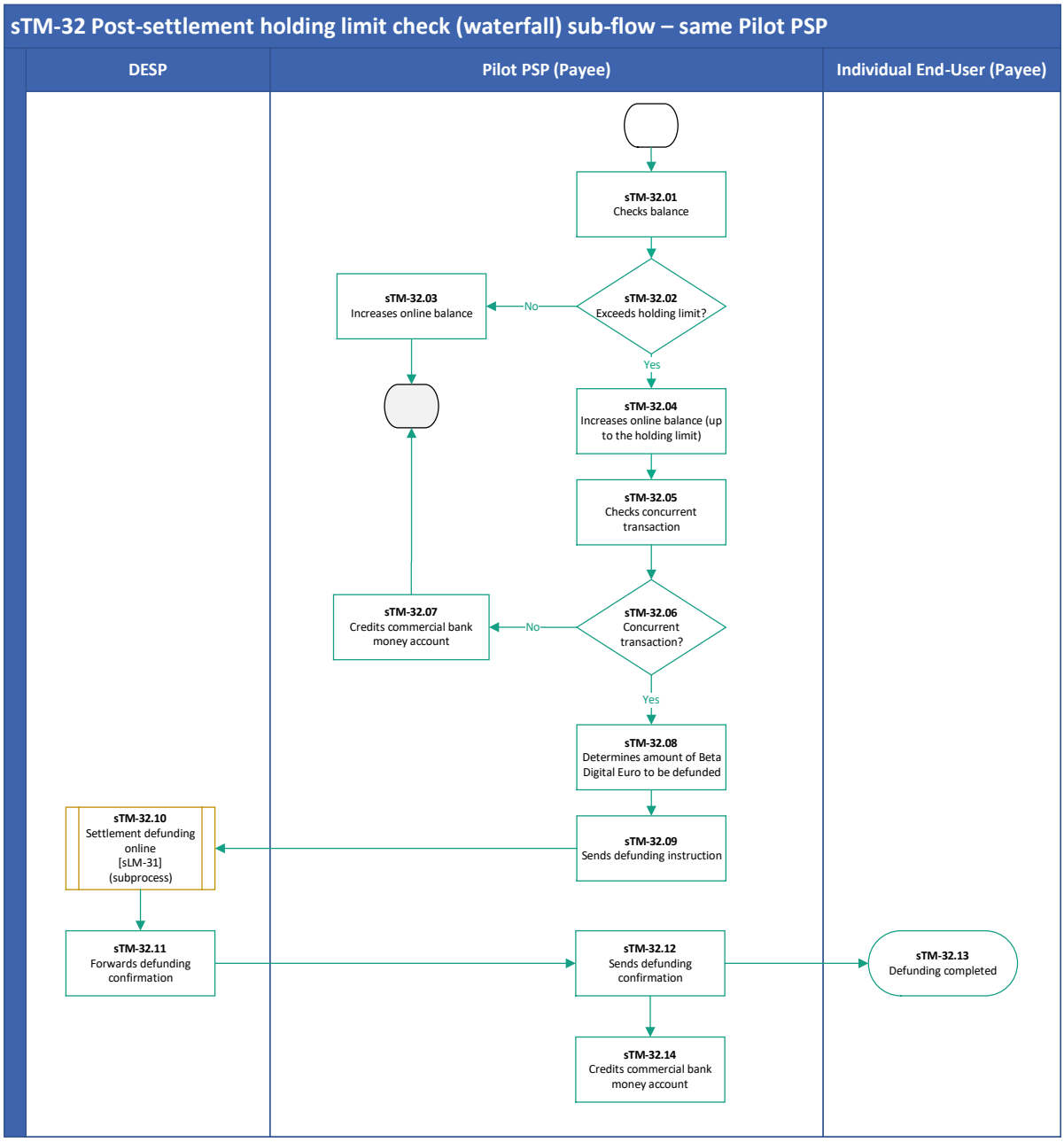
sTM-53 Payee's Pilot PSP processing sub-flow

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-53.01	**Validates request**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP validates the defunding request.
sTM-53.02	**Checks linked commercial bank money account status**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP checks if the linked account is in a valid state. *Step-specific business rules: TM-000-007, TM-001-001*
sTM-53.03	**Valid?**	Pilot PSP (Payee)	N/A	If the user's commercial bank money account is not valid, the transaction is rejected. *Note: Validation may be executed on the request's format or its content from a technical and functional perspective in accordance with established business rules.* *Step-specific business rules: TM-000-007, TM-001-001*
sTM-53.04	**Sends rejection**	Pilot PSP (Payee)	DESP – Eurosystem - Access Gateway Service	The Payee's Pilot PSP rejects the request and sends a rejection message specifying the error type to the Eurosystem – Access Gateway Service.
sTM-53.05	**Sends confirmation and settlement details**	Pilot PSP (Payee)	DESP – Eurosystem - Access	The Pilot PSP sends the confirmation and required settlement details for the defunding transaction to the Eurosystem - Access Gateway Service. *Step-specific business rules: TM-001-001*

			~~Gateway Service~~	

3.6.7 Post-settlement holding limit check – Waterfall

These sub-processes are only triggered post settlement to ensure that the holding limit is not exceeded in case of concurrent inbound payments. The standard waterfall is integrated into the payment settlement process. Steps characterising the post-settlement holding limit check, with possible waterfall, for same Pilot PSPs are presented and depicted in the following flows:

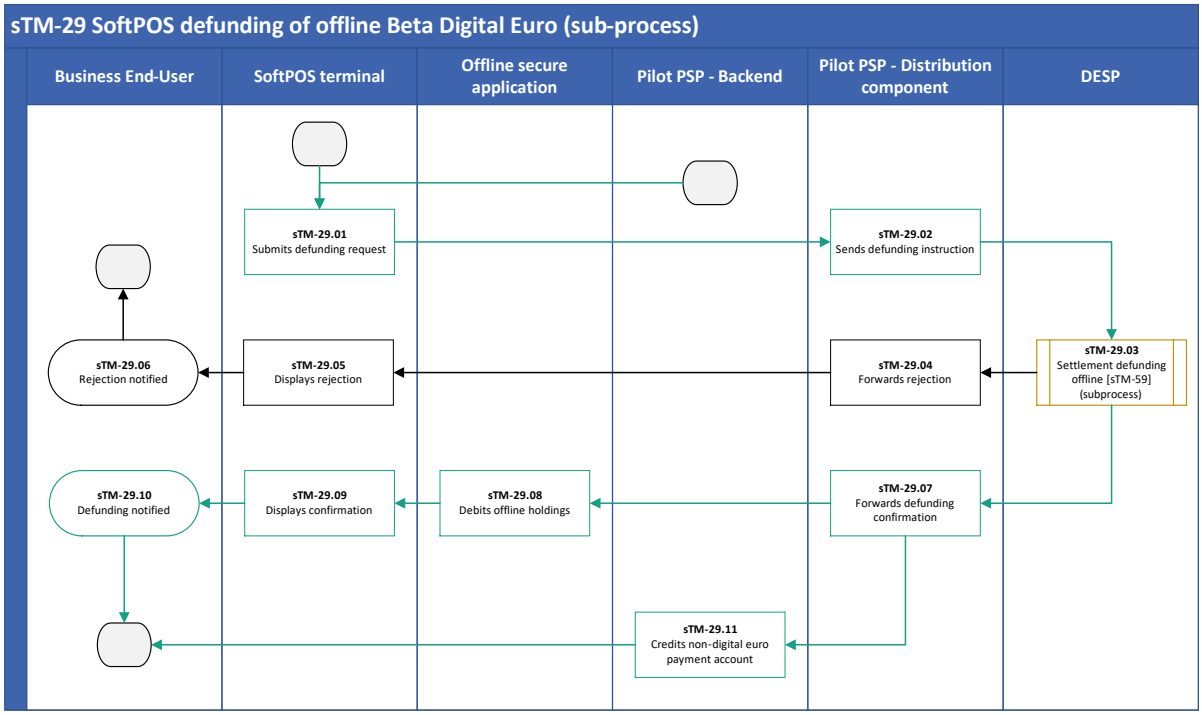


sTM-32 Post-settlement holding limit check (waterfall) sub-flow - same Pilot PSP

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-32.01	**Checks balance**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP checks additionally if the transaction received would push the Payee's balance over the holding limit.
sTM-32.02	**Exceeds holding limit?**	Pilot PSP (Payee)	N/A	If the holding limit would not be exceeded, the Pilot PSP increases the Payee's balance. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002*
sTM-32.03	**Increases online balance**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP increases the online balance of the Payee. *Step-specific business rules: LM-010-001, LM-011-001, LM-011-002*
sTM-32.04	**Increases online balance (up to the holding limit)**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP increases the online balance of the Payee up to the holding limit. If the user's online balance is already matching the holding limit, there is no need to further increase it.
sTM-32.05	**Checks concurrent transaction**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP checks if the transaction being processed was part of a set of concurrent transactions.
sTM-32.06	**Concurrent transaction?**	Pilot PSP (Payee)	N/A	If the transaction being processed is not part of a set of concurrent transactions, waterfall (if required) has been performed as part of the settlement of a combined transaction earlier in the process. In that case, the crediting of the user's commercial bank money account is the only step which remains to be performed. However, if the transaction being processed is part of a set of concurrent transactions (i.e., incoming payments or funding operations) defunding is required to ensure the balance remains below the holding limit.
sTM-32.07	**Credits commercial bank money account**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP credits the Payee's linked commercial bank money account with the defunding amount determined during the pre-validation phase. *Step-specific business rules: LM-050-003*
sTM-32.08	**Determines amount of Beta Digital Euro to be defunded**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP determines the amount of money that needs to be defunded (transferred from the user's Beta Digital Euro payment account to the user's linked commercial bank money account). *Assumption: the amount above the holding limit needs to be defunded.*
sTM-32.09	**Sends defunding instruction**	Pilot PSP (Payee)	DESP	The Payee's Pilot PSP sends a defunding instruction to the DESP.
sTM-32.10	**Settlement defunding online [sLM-31]**	DESP	N/A	The DESP initiates the settlement defunding online **[sLM-31].** *Note: the settlement verification step of online balance does not need to be executed in this case as previously performed during the transaction settlement.*

sTM-32.11	**Forwards defunding confirmation**	DESP	Pilot PSP (Payee)	The DESP forwards defunding confirmation to the Payee's Pilot PSP.
sTM-32.12	**Sends defunding confirmation**	Pilot PSP (Payee)	Individual End-User (Payee) and/or N/A	The Payee's Pilot PSP informs the Payee about the defunding.
sTM-32.13	**Defunding completed**	Individual End-User (Payee)	N/A	The Individual End-User (Payee) is informed that the defunding operation has been completed successfully.
sTM-32.14	**Credits commercial bank money account**	Pilot PSP (Payee)	N/A	The Payee's Pilot PSP credits the Payee's linked commercial bank money account with the defunded amount.

3.6.8 SoftPOS defunding of offline Beta Digital Euro



sTM-29 SoftPOS defunding of offline Beta Digital Euro (sub-process)

#Step	Step name	Initiating actor(s)	Receiving actor(s)	Definition
sTM-29.01	**Submits defunding request**	SoftPOS terminal	Pilot PSP – Distribution component	The SoftPOS terminal submits a defunding request. This can happen for an offline amount received as payments or in the context of an offboarding operation, triggered by the Pilot PSP, where funds need to be defunded. *Step-specific business rules: LM-012-002*
sTM-29.02	**Sends defunding instruction**	Pilot PSP – Distribution component	DESP	The Pilot PSP's distribution component sends the defunding instruction to the DESP.

sTM-29.03	**Settlement defunding offline [sTM-59]**	DESP	Pilot PSP – Distribution component	The DESP performs the Settlement defunding offline **[sTM-59]** to redeem offline Beta Digital Euro and to credit the Pilot PSP's DCA for the same amount.
sTM-29.04	**Forwards rejection**	Pilot PSP – Distribution component	SoftPOS terminal	If the Settlement defunding offline sub process resulted in a rejection of the instruction, the Pilot PSP (Distribution component) receives the rejection and forwards it to the SoftPOS terminal.
sTM-29.05	**Displays rejection**	SoftPOS terminal	Business End-User	The SoftPOS displays a rejection message to the Business End-User.
sTM-29.06	**Rejection notified**	Business End-User	N/A	The Business End-User is notified of the rejection and the rejection reason.
sTM-29.07	**Forwards defunding confirmation**	Pilot PSP – Distribution component	Offline secure application and/or Pilot PSP - Backend	The Pilot PSP's distribution component forwards the defunding confirmation to the backend of the Pilot PSP and to the offline secure application.
sTM-29.08	**Debits offline holdings**	Offline secure application	SoftPOS terminal	The offline secure application debits the offline holdings for the defunded amount.
sTM-29.09	**Displays confirmation**	SoftPOS terminal	Business End-User	The SoftPOS terminal displays the defunding confirmation to the Business End-User.
sTM-29.10	**Defunding notified**	Business End-User	N/A	The Business End-User is notified about the defunding.
sTM-29.11	**Credits commercial bank money account**	Pilot PSP - Backend	Business End-User	The Pilot PSP's backend credits the commercial bank money account of the Business End-User.