

Update on the work of the digital euro scheme's Rulebook Development Group

09 April 2025

Executive summary

One of the key deliverables of the digital euro preparation phase is the draft digital euro scheme rulebook, which is being developed in cooperation with the digital euro scheme's Rulebook Development Group (RDG).¹ To ensure a high level of transparency, the European Central Bank (ECB) frequently provides updates on the status of the rulebook's development and the work of the RDG. This report provides information about the RDG's activities since the last progress report on its work, which was published in September 2024.²

A digital euro would be central bank money in digital form, issued by the Eurosystem. It would serve as a means of payment for use by consumers and businesses in retail transactions across the entire euro area.³ In addition, it would be free for basic use, available both online and offline and designed to offer the highest level of privacy and safety.

The digital euro scheme rulebook will provide a single set of rules, standards and procedures for digital euro payments. The rulebook's requirements and specifications will be addressed to payment service providers (PSPs), enabling them to develop basic digital euro services and potentially offer additional, innovative services. The rulebook's open standards will facilitate private retail payment solution providers to roll out solutions across the euro area, thereby mitigating the current market fragmentation, supporting innovation and competition. PSPs' adherence to the rulebook will ensure that, if a digital euro is issued, the user experience is consistent across basic use cases throughout the entire euro area, irrespective of the country or the PSP used. Since the last progress report, progress has been made in three key areas.

First, as a follow-up to the RDG's interim review of the intermediate version of the rulebook in the first half of 2024, existing sections have been updated to reflect comments received from the RDG. The third progress report provided an extensive description of the review process, which resulted in more than 2,500 comments. As of 1 March 2025, the cut-off date for this fourth report, well over 2,000 comments had been addressed and 254 comments were still considered to be

¹ For more information about the RDG, see the "[Digital euro scheme rulebook](#)" section of the ECB's website.

² see the MIP News item of 5 September 2024 entitled "[ECB reviews progress on digital euro rulebook](#)" on the ECB's website.

³ For more information, see the "[Digital euro](#)" section of the ECB's website.

“open” as they require further elaboration or depend on outstanding dossiers, including the regulation.

Second, the rulebook has been further developed together with market participants in dedicated RDG workstreams.

Since September 2024, there have been eight active RDG workstreams⁴, each consisting of a range of experienced professionals. Since January 2025, two of these workstreams have concluded their work for the time being, while six of the workstreams are still active and have ongoing or planned sprints. The main aspects covered are (i) refining minimum user experience standards based on clear principles, (ii) creating the guidelines ensuring a consistent roll out and recognition of the future digital euro brand and (iii) developing a front-end certification and approval framework for drawing on existing standards to ensure a harmonised approach across the euro area. The focus has also been on developing risk management requirements to mitigate risks such as fraud risk and operational risk, and on further developing front-end and back-end implementation specifications.

Third, the RDG has been involved in several ad hoc discussions – mainly in the form of expert sessions with market representatives nominated by the RDG – concerning topics that do not require a dedicated workstream. Expert sessions have been held on latency⁵ and on dispute management⁶. In addition, the RDG has been informed of interactions with standardisation bodies about standards identified as being potentially suitable for use with the digital euro.

Looking ahead, the next draft of the digital euro scheme rulebook will be prepared and shared with RDG members and their constituents so that they can provide their comments.

In parallel, the RDG will continue to work on the next version of the rulebook, including additions like further implementation specifications, non-functional requirements and risk management matters. Additionally, significant updates will be delivered on the end-to-end flows and illustrative user journeys. The draft rulebook will be flexible enough to accommodate any future adjustments arising from the legislative discussions among the co-legislators on the digital euro regulation proposed by the European Commission in June 2023.⁷

⁴ For more information, see the MIP news item of 18 March 2024 entitled “[Creation of seven additional workstreams of the digital euro Rulebook Development Group \(deadline extended to 23 April 2024\)](#)” and the MIP news item of 29 November 2024 entitled “[Call for candidates to contribute to the digital euro brand rules \(deadline extended to 13 January 2025\)](#)”, both on the ECB’s website.

⁵ Latency is defined as the time that elapses from the moment the acquiring PSP receives the payment instruction until the time the acquiring PSP receives confirmation/notice of rejection.

⁶ Dispute management covers the rules and mechanisms for resolving disputes between scheme participants and ultimately end users.

⁷ [Proposal for a Regulation of the European Parliament and of the Council on the establishment of the digital euro, COM \(2023\) 369 final, 28 June 2023.](#)

One of the key objectives of the digital euro project⁸ is to prepare a draft digital euro scheme rulebook. The rulebook will consist of a single set of rules, standards and procedures to standardise digital euro payments and related activities across the euro area. It will draw on existing technical standards, for instance for the interfaces at the front end and back end. The rulebook will be addressed to payment service providers (PSPs) participating in the scheme, who will have to adhere to the rulebook's requirements while preserving ample flexibility to develop innovative solutions. Thanks to this standardisation, users' experience of the digital euro will be the same across the entire euro area for all main use cases (whether at the point of sale, in person-to-person transactions or in e-commerce), irrespective of the PSP used or the country in which the payment was made – just as is the case for euro cash today. Furthermore, the digital euro rulebook will enable private retail payment solution providers to utilise and build on its open standards to launch new products with immediate access to markets beyond their domestic borders, addressing market fragmentation and promoting innovation and competition.

The draft digital euro rulebook is being developed with the digital euro scheme's Rulebook Development Group (RDG). The RDG was established in January 2023, and its members are senior representatives from European associations representing both the supply and demand side of the retail payments market. These associations represent consumers, retailers and PSPs. In addition, representatives of the national central banks, the European Commission, the (rotating) Presidency of the Council of the European Union and the European Parliament are invited as observers to RDG meetings. The Governing Council of the European Central Bank (ECB) ultimately will decide on the adoption of the initial digital euro rulebook.

The rulebook builds on the current design choices made by the Governing Council of the ECB and will be fully in line with the digital euro regulation.⁹ The draft rulebook will be flexible enough to accommodate any future adjustment arising from the legislative discussions among the co-legislators on the digital euro regulation proposed by the European Commission in June 2023.¹⁰ In addition, the Eurosystem is committed to drawing on and building on existing standards and scheme solutions as much as possible to create synergies and limit implementation costs – all the while preserving the Eurosystem's freedom of choice when it comes to further developing the digital euro.

Since the last update in September 2024, the work of the RDG has progressed in three main areas. Following the RDG's interim review of the intermediate version of the rulebook in 2024, the existing sections were updated in light of the 2,500 comments provided by the RDG. Second, in a total of seven RDG workstreams,

⁸ The ECB's Governing Council will only decide whether to issue a digital euro once the relevant legislative act has been adopted

⁹ See "A stocktake on the digital euro – Summary report on the investigation phase and outlook on the next phase", ECB, October 2023.

¹⁰ See Proposal for a Regulation of the European Parliament and of the Council on the establishment of the digital euro, COM (2023) 369 final, 28 June 2023.

market experts appointed by RDG members further developed existing and new sections of the rulebook. Since September 2024, these workstreams have delivered a framework for establishing minimum user experience (UX) requirements, the mapping of relevant standards and certifications, measures to mitigate fraud-related risks and implementation specifications defining the interactions taking place among the end-user, PSP and digital euro service platform (DESP) domains. Third, expert sessions and workshops with RDG-nominated members have been held on dispute management and latency, while discussions of other topics have also taken place, for example in the ongoing exchanges with standardisation bodies.

Figure 1
Sections and annexes

Sections & Annexes
Section 1. Document information: overview of versions and updates to the rulebook
Section 2. Scheme scope and interplay: actors involved in the digital euro, their relationships, and the rulebook's scope.
Section 3. Functional and operational model: functional requirements for digital euro use cases, using high-level flows and business rules, and reference to annexed user journeys, end-to-end flows, identification, authentication, and dispute management.
Section 4. Adherence model: scheme adherence, including participant eligibility, obligations, and termination rules, and reference to annexed detailed processes.
Section 5. Technical scheme requirements: overview of digital euro architecture, implementation domains, link to detailed specifications, non-functional PSP requirements, and related annex.
Section 6. Risk management: risk management requirements for PSPs, including fraud and operational risk management, based on existing regulations with additional digital euro specifics.
Section 7. Scheme management: incl. rulebook management and change request process for rulebook within release cycles.
Section 8. Defined terms and abbreviations: glossary of key terms used across the rulebook
Annex A – Functional and operational model: Illustrative user journeys, end-to-end flows, branding standards and dispute management
Annex B – Testing, certification and approval
Annex C – Technical scheme requirement
Annex D – Implementation specifications
Annex E – Scheme management
Annex F – Applicable standards and certification

This report is part of the ECB's regular updates on the status of the rulebook and the RDG's progress, reflecting its commitment to ensuring that the digital euro project adheres to the principle of transparency.¹¹ It is the fourth progress report, with the previous update having been published by the ECB in September 2024. This latest report provides a structured overview of the RDG's working process and the progress made towards the aim of delivering a draft digital euro scheme

¹¹ In addition, the agenda and the minutes of the RDG meetings are regularly shared on the "Technical documents and research" section of the ECB's website.

rulebook. Section 2 sets out the progress made on addressing the RDG's comments on the intermediate draft rulebook. Section 3 takes a closer look at the set-up and progress of the dedicated workstreams, while Section 4 covers the RDG's non-workstream related activities. Finally, Section 5 looks ahead to the activities and deliverables planned for the remainder of 2025 and beyond.

2

Follow-up to the RDG review of the intermediate draft rulebook

As a follow-up to the RDG's interim review of the intermediate version of the rulebook in the first half of 2024, existing sections of the rulebook were updated to reflect comments received from the RDG. The third progress report provided an extensive description of this process, which resulted in more than 2,500 comments. The ECB carefully considered each comment and either directly addressed it in the rulebook or explained why the comment could not be addressed in the rulebook. There could be various reasons for not addressing a comment in the rulebook, for instance if the comment refers to an item outside the RDG's mandate or if it would be addressed in documentation other than the rulebook. For some of the comments, further consideration was required, and the ECB followed up on these in discussions with the RDG. The RDG was regularly asked to provide, where necessary, additional clarification on its comments to ensure that a detailed analysis could be made.

As at 1 March 2025, over 2,000 comments had been addressed, while only 254 comments were still considered "open" as still further elaboration was required on related topics which, according to the project planning, had not yet been addressed. Comments that initially required consideration by the ECB have since been addressed and have had a significant effect on user journeys and end-to-end (E2E) flows. The comments have served as input for further refining the user journeys, which now provide a more comprehensible and consistent view of the various digital euro services. For example, the E2E flows have been restructured, with more intuitive categorisation and mapping to the user journeys. Additionally, the RDG review has served as input for adjusting, for example, pay by link¹² flows and QR-code¹³ based payment flows with the addition of steps that increase data protection. The RDG review of the operational rules led to the restructuring of Section 3.3 of the rulebook (entitled "Overview of services"). Individual operational rules have been refined and made specifically applicable to different digital euro services (e.g. onboarding and notification services), payment methods (i.e. more specific operational rules for point of sale, person-to-person (P2P) and electronic and mobile commerce (e/m-commerce) payments), and liquidity management services. In addition, the refinement of operational rules has allowed these operational rules to be mapped to the E2E flows, clarifying the activities and conditions for the actors

¹² An online digital euro payment transaction method in which a payee generates a digital euro payment transaction request link and sends it to the payer via a third-party communication channel (e.g. e-mail, SMS, messaging application).

¹³ Quick Response code based digital euro transactions via the use of a two-dimensional matrix barcode in the form of a machine-readable optical label with digital information, shared between payer and payee.

involved in offering digital euro services. Finally, Section 8, entitled “Defined terms and abbreviations”, has been revised based on the RDG’s review.

The ECB together with the RDG will continue working on the comments still open to ensure that all of them are addressed. The open comments relate to areas including the adherence model¹⁴, dispute management, the onboarding and offboarding of PSPs to the scheme and various initiation and acceptance technologies for digital euro payments. In addition, certain comments are linked to the final draft of the digital euro regulation. These comments will be addressed as the RDG further elaborates on the topics in question. The ECB is supported in these efforts by the RDG’s workstreams, the progress of which will be described in more detail below. Alongside these work streams, several expert sessions have been organised. The outcome of these discussions is also set out in further detail below.

3 Report on the progress of the RDG workstreams

In parallel with the review of the intermediate draft rulebook, the RDG continued to further develop existing sections and draft additional sections of the rulebook. This section reports on the status of the workstreams in which rulebook content is being developed. Participants in the workstreams are either nominated by RDG members or assigned to the workstreams on an individual basis. Approximately 50 participants are active across all workstreams. They come from over 30 different organisations, spanning most of the euro area countries. They offer expert input from a range of organisations, such as banks, technical service providers, payment schemes, consumer groups, acquirers, merchants, IT providers, certification bodies and standardisation organisations. Figure 2 provides an overview of the workstreams. Workstreams A1 and F1 concluded already prior to the September progress report. Since September 2024, workstreams A2 and B1 have concluded the work for the time being and the delivered outputs are being used to draft the respective rulebook sections. Workstream C1 has evolved into the four G workstreams.

¹⁴ The adherence model outlines the requirements, procedures, and standards that PSPs need to meet to ensure compliance and become and remain participants to the scheme.

Figure 2
Overview of the RDG workstreams

	A1. Identification and authentication
	A2. Minimum user experience standards
	A3. Brand rules
	B1. Certification and approval framework
	C1. Technical scheme requirements
	D1. Risk management
	F1. Scheme compatibility
	G1. Front-end implementation specifications for end-user interfaces
	G2. Front-end Implementation specifications for individual-user PSP interfaces
	G3. Front-end Implementation specifications for acquiring PSP interfaces
	G4. Back-end implementation specifications for PSP-to-DESP interfaces
	Currently active workstreams

3.1 Workstream A2: Minimum user experience standards

The main objective of workstream A2 is to propose a set of minimum user experience (UX) standards that help ensure a state-of-the-art, harmonised and recognisable UX. The definition of minimum standards in the rulebook helps achieve a consistent UX across different digital euro use cases, independently of the country of use and the PSP providing the digital services – as it is for cash today. The consistent UX experience complements and mirrors the consistent experience of using banknotes, which are uniform and used in the same manner across the euro area. At the same time, PSPs are able to integrate the digital euro into their existing proprietary interfaces, allowing for innovation and building on existing strengths and best practices while minimising cost implications.

Based on expert input and an analysis of existing market practices, the workstream has made a comprehensive set of UX recommendations. These include both generic recommendations and specific ones tailored to selected use cases across various user journeys, such as access management and liquidity management. In addition, the workstream has engaged in a workshop with external accessibility experts to discuss integrating the requirements of the European Accessibility Act (EAA)¹⁵, thus ensuring that the guidelines provided by the workstream participants are inclusive and adhere to accessibility standards.

A framework has been developed to determine where UX requirements are needed and what should be included in such requirements. The framework builds on two principles. The principle of proportionality ensures that UX standards are defined in a way that includes as few as possible, but as many as necessary.

¹⁵ Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services (OJ L 151, 7.6.2019, p. 70). The digital euro app will incorporate all the requirements under the EAA, and additional accessibility measures are being explored with the aim of increasing the accessibility and inclusivity of the solution.

The principle of equivalence means that the minimum UX requirements set out in the rulebook will apply to all PSPs. If comparable digital means of payment also provided by the PSP exceed these requirements, PSPs must ensure that the digital euro UX is at least equivalent to the UX of their respective proprietary services. Four criteria have been developed to assess the necessity of a minimum UX requirement, in accordance with the proportionality principle. These criteria assess whether adding a minimum UX requirement would be necessary to:

1. ensure the functionality of the digital euro including security and privacy considerations;
2. ensure the fair positioning of the digital euro in relation to other front-end payment services provided by PSPs;
3. ensure sufficient information on the digital euro is displayed to the end-user to ensure they are fully in control of their actions;
4. optimise accessibility and inclusion for the digital euro.

For each criterion that is met, one or more mandatory minimum UX requirements will be drafted. If none of the four criteria are fulfilled, the UX requirements will be optional rather than mandatory.

The digital euro user journeys and the workstream recommendations will be evaluated in light of these principles and supplemented with UX requirements to be included in the rulebook. Figure 3 illustrates how the methodology is applied to a user journey where an end user requests an alias¹⁶ during the onboarding process. To ensure the functionality of the digital euro, a seamless registration process, which includes requesting and selecting an alias,¹⁷ is considered necessary. Therefore, a minimum UX requirement would be established based on the equivalence principle. Such requirements set a baseline standard for the user's experience when requesting an alias. They also ensure that the UX is equivalent to that of any comparable flows already offered by the PSP.

¹⁶ An alias is an alternative means of identification that could be used in the same way as the digital euro account number (DEAN). A user could register an alias, for example a phone number, with their respective PSP.

¹⁷ See [Proposal for a Regulation of the European Parliament and of the Council on the establishment of the digital euro](https://eur-lex.europa.eu/resource.html?uri=cellar:6f2f669f-1686-11ee-806b-01aa75ed71a1.0001.02/DOC_1&format=PDF), COM (2023) 369 final, 28 June 2023. "Regulation of the European Parliament and of the Council on the Establishment of the Digital Euro", https://eur-lex.europa.eu/resource.html?uri=cellar:6f2f669f-1686-11ee-806b-01aa75ed71a1.0001.02/DOC_1&format=PDF

Figure 3

Example of applying the minimum UX approach

User journey: Onboarding through mobile app, individual already known to intermediary, no existing digital euro account
Step 3 – End user requests alias: selection of alias type and entry of alias value

1. Applying the proportionality principle to each step of all user journeys

Functionality	✓ Seamless registration is required for adoption.
Positioning	✗ No positioning of the digital euro is involved in this specific step.
Information	✗ No information specific to this UJ has to be displayed to the end-user.
Accessibility	Will be addressed based on compliance with European Accessibility Act.

2. Drafting the minimum UX requirement according to the equivalence principle

Min UX requirement: PSP must ensure default settings and data are used as much as possible to optimise user journeys (e.g. pre-filled data for alias) for the end user equivalent to comparable PSP flows.

Min UX requirement: PSP must ensure any existing validation flow is also provided to validate the newly entered information, if pre-filled information is not available for the alias.

3.2

Workstream A3: Brand rules

The most recent workstream started in January 2025 with the aim of developing a proposal for digital euro branding rules to be implemented by the PSPs in their end-user solutions (i.e. website, apps, different user interfaces).

Brand rules govern the use of visual and conceptual elements of the brand to ensure a unified image is maintained across various channels, enhancing brand recognition and building trust among consumers, while considering ease of implementation for PSPs. To ensure alignment with industry standards, the work builds on extensive market research into other external brand rulebooks from major payment schemes, international banks and other financial institutions. Industry experts with branding and payments expertise are being engaged to provide key insights and assist in drafting rules. The workstream began with a review of existing brand rulebooks.

As a next step, the minimum branding requirements for the use of the digital euro brand and assets will be defined, ensuring that the digital euro brand remains consistent, recognisable and effectively implemented by PSPs. This will involve defining guiding principles and general rules. These will be applicable to all brand touchpoints, referring to any interaction between the brand and its potential customers. Additionally, detailed rules will be set out for the use of brand assets in specific user journeys. The scope is limited to developing brand rules for PSP use within the digital euro scheme, excluding aspects related to the overall brand strategy and visual identity. Topics that will be addressed in the workstream include, but are not limited to, logo placement, integration guidelines for PSPs and digital brand security measures aimed at preventing misuse, infringement, and malicious activities that could harm the brand's integrity.

3.3 Workstream B1: Certification and approval framework

The goal of this workstream is to develop the applicable certification and approval framework for the digital euro scheme. The framework focuses on front-end elements, consisting of all the devices and applications the end user will interact with, such as payment terminals, ATMs or mobiles. The workstream has developed recommendations for certification as well as the scheme onboarding process, drawing as far as possible on existing certification processes and standards in the market.

Building on these initial recommendations, an overview of certifications and standards for each form factor¹⁸ has been developed, setting out the respective responsibilities of PSPs and technical solution providers (TSPs). A matrix has been constructed to assign a score to the criticality of each certificate and to determine whether and where certificates should be mandatory or whether a self-evaluation of testing requirements is enough, possibly reducing certification obligations. The back-end testing and certification process will be covered by the digital euro service platform (DESP) and is not within the scope of workstream B1.

Figure 4 shows a synthetic view of envisaged standards and related certification processes that may be used by the digital euro for the online use cases. At the current stage, the table simply shows working assumptions.

¹⁸ In the context of payments, “form factors” relate to the physical or digital design of a payment device or method. They describe how a payment instrument, such as a credit card, mobile phone, wearable or chip card, is presented or used. Form factors influence how consumers interact with payment systems.

Figure 4

Illustration of envisaged standards and related certification processes under investigation

				TSP related standards and certifications		TSP or PSP-related standards and certifications	PSP-related standards and certifications	
	Channel	Form factor	Technology	Security & authentication	Functional	Payment request QR code, pay by link, alias	Integration or personalisation	End to end testing
Online	Online POS channel	POS	QR code			EPC QR ⁽²⁾		
		Card	NFC/contact		CPACE ⁽¹⁾		Nexo ⁽³⁾	D€ specific
		Mobile application (SDK)	NFC		CPACE ⁽¹⁾			
	Online ATM channel	ATM	QR code			EPC QR ⁽²⁾		
		Card	NFC/contact		CPACE ⁽¹⁾		Nexo ⁽³⁾	D€ specific
		Mobile application (SDK)	NFC		CPACE ⁽¹⁾			
	E-commerce and m-commerce	Payment gateway (e-commerce)	QR code			EPC QR ⁽²⁾		
			Pay by link			D€ specific		
		Merchant Mobile app (m-commerce)	Alias (mobile)			Nexo ⁽³⁾		
	P2P channel	Mobile application	App to app (PbL + Alias)					D€ specific
Offline	Offline POS channel	POS	NFC/contact					
		Card	NFC/contact					
		Mobile application	NFC/contact					
	Offline P2P channel	Mobile application	NFC (mobile/mobile)					D€ specific
		Mobile application	NFC (mobile/card)					
		Card	Battery powered card					
		Bridge	Bridge (contact card/contact card)					

Standards under analysis

Discussion ongoing regarding gaps with the organisation owning the

No leverageable standard and certification process

No required certificate (under investigation)

(1) Existing certification process

(2) No certification process

(3) Existing certification process but specific to Cartes Bancaires & Girocard

CPACE = Common Payment Application Contactless Extension

EPC QR = European Payment Council Quick Response

NFC = Near-field communication

PbL = Pay by link

POS = Point of sale

P2P = Peer-to-peer

SDK = Software Development Kit

3.4

Workstream D1: Risk Management

The main objective of workstream D1 is to develop a proposal for the risk management section of the digital euro scheme rulebook covering the “end user to intermediary to DESP” space. The workstream has developed a detailed taxonomy covering the main risks faced by the scheme, such as fraud risk and operational risk (including risks to business continuity, cyber risk and third-party risk).

Since the last progress report, published in September 2024, the workstream has developed a proposal to manage the fraud risk associated with digital euro transactions. The proposal builds on existing regulatory requirements (the Payment

Services Directive, PSD2¹⁹) and the workstream has focused on due diligence measures when onboarding merchants, along with periodic controls to prevent the involvement of fraudulent actors. In addition, the workstream has proposed rules to reduce the risk of scams and impersonation. This is, as well as to ensure that payers are not misled and have the opportunity to give informed consent at each stage of a transaction (i.e. initiation of the payment, consent, authentication and confirmation). The workstream has also made proposals on (i) the exchange of information on fraud developments, (ii) creating situational awareness, and (iii) fraud reporting and interactions with the digital euro Risk and Fraud Management (RFM) component.

The workstream's work on operational risk has been focused on rules to address risks to business continuity arising from external events, system outages, unavailability of resources, cyber risk and general ICT risk, as well as risks from third-party service providers. To ensure business continuity, the workstream emphasises robust business continuity plans and frameworks tailored to the specific requirements of the digital euro. This includes making use of business impact analysis. This looks at the impact on participants and their clients (business and individual users), including redundancy expectations and how they manage their third-party dependencies.

The workstream has also focused on addressing cyber risk, which is the most significant element of general ICT risk. While ensuring PSPs comply with existing regulatory frameworks (particularly the Digital Operational Resilience Act, DORA²⁰), the workstream emphasises the need for additional measures tailored to the digital euro. This includes the implementation of a robust cybersecurity framework and relevant standards that cover identification, protection, detection, response and recovery from cyber threats. In addition, the workstream highlights the role of the scheme in developing and supporting situational awareness of cyber threats, fostering collaboration across participants and ensuring that cybersecurity measures are consistently applied throughout the ecosystem.

For third-party risk, the workstream participants agreed that PSPs remain responsible for outsourced services performed by third-party service providers (TPSPs). TPSPs could support a PSP's operations by providing cloud services, data storage, cybersecurity, payment processing systems and other IT services. The failure of a TPSP could materially impact the PSP's ability to provide services, particularly when the PSP relies on them for essential functions. The workstream's proposal includes adopting the DORA framework for maintaining and updating a list of critical TPSPs used by PSPs, as well as establishing criteria for identifying critical TPSPs (e.g. technical processors and utility providers).

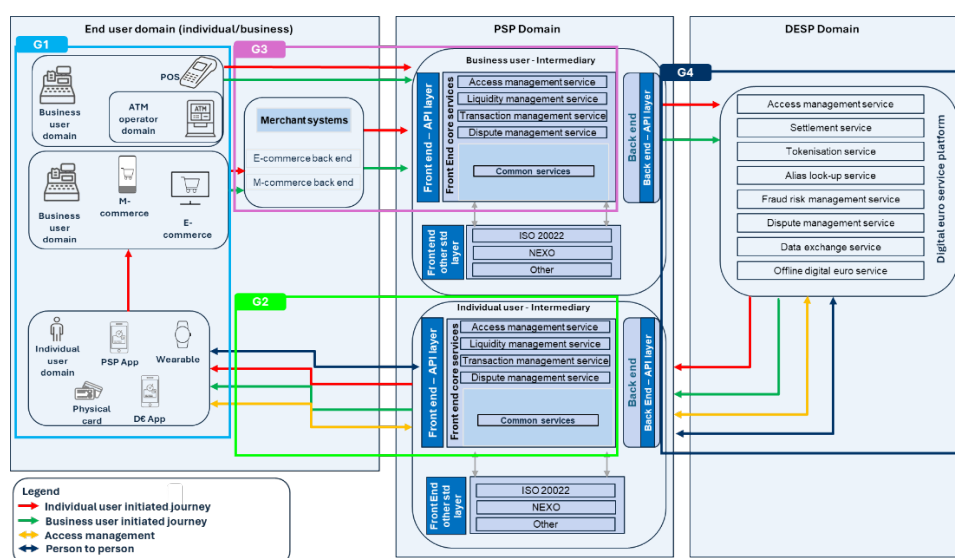
¹⁹ Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (OJ L 337, 23.12.2015, p. 35).

²⁰ Regulation (EU) 2022/2554 of the European Parliament and of the Council of 14 December 2022 on digital operational resilience for the financial sector and amending Regulations (EC) No 1060/2009, (EU) No 648/2012, (EU) No 600/2014, (EU) No 909/2014 and (EU) 2016/1011 (OJ L 333, 27.12.2022, p. 1).

3.5 Workstreams G1 to G3: Front-end implementation specifications; and workstream G4: Back-end implementation specifications

Four workstreams were initially established to specify the interactions taking place within and among the end-user domain, PSP and DESP domains. For practical reasons a single group now covers workstreams G1 to G3. Each of the workstreams G1 to G3 addresses implementation specifications for interactions between end users and PSPs in the front-end domain, while workstream G4 focuses on the back end domain. An overview of the functional architecture and interactions in these domains can be found in Figure 5.

Figure 5
The functional architecture specifying the digital euro's domains and their interfaces



Workstream G1 to G3 focus on the front-end implementation specifications as follows:

- G1 is responsible for implementation specifications at the device level;
- G2 focuses on implementation specifications for interactions between the individual user and the distributing PSP;
- G3 focuses on implementation specifications for interactions between the business user and the acquiring PSP.

Meanwhile, workstream G4 focuses on implementation specifications for interactions between PSPs and the DESP, representing the back-end domain.

Workstreams G1 to G3 are primarily concerned with aspects concerning the front-end domain, such as notification management and interactions among individual users, business users and PSPs in areas such as transaction management and access management. Workstream G1 has developed

specifications for acceptance devices in the proximity environment (i.e. point of sale and ATM) and remote environment (i.e. e-commerce and m-commerce). Workstream G2 has been dedicated to drafting implementation specifications for P2P transactions via QR code, pay by link, alias and the digital euro account number (DEAN). The specifications for recurring payments are also being considered.

The workstream participants agreed on a DEAN structure made up of an EU code, check digits an indicator digit and a basic European account number (BEAN) (Figure 6). The DEAN will have a fixed length of 18 characters. The DEAN may include digits from 0 to 9, as well as the Latin alphabet characters “E” and “U”. This standard will be applicable to all countries, irrespective of the national language’s alphabet. The DEAN supports the unique digital euro functionality of carrying over, or “porting”, the account number when the user switched from one PSP to another. Furthermore, implementation specifications are being drafted related to e-commerce and m-commerce, focusing on the interaction between business users and PSPs. The type of payments covered include one-time payments, recurring payments and pre-authorisation. E-commerce transactions are planned to be initiated via QR code, pay by link, alias and DEAN. This workstream’s activities also include the development of a data model and data dictionary for the front-end domain of the digital euro scheme rulebook.

Figure 6
The characteristics of the digital euro account number



Workstream G4 defines back-end implementation specifications that include an overview of DESP interfaces, message types and applicable data elements. Work in the last quarter of 2024 focused on the alias lookup service, which for instance allows a DEAN associated with an optional proxy alias (mobile number) to be retrieved, and on the Secure Exchange of Payment Information (SEPI) service, including QR-code and pay by link tokenisation.²¹ Since January 2025 the workstream has focused on settlement services, and this activity is currently ongoing.

²¹ “Tokenisation” here refers to the process of replacing real account or card details with a unique identifier or “token” that can be used in place of the actual data, ensuring security and privacy during digital transactions.

RDG input on further areas of relevance for the rulebook

The RDG has been involved in several ad hoc discussions – mainly in the form of market expert sessions – concerning topics that do not require a workstream. Expert sessions have been organised on the topics of latency, dispute management and standardisation bodies.

Expert sessions have been held on latency, beginning with an assessment of the back-end E2E latency for the use case of a near-field communication (NFC)²² payment at the point of sale. Low latency is a key feature ensuring the immediate transfer of digital euro or check-out at the point of sale or in e-commerce. In the expert sessions, RDG members provided latency inputs for comparable flows currently in place, for instance for card payments. The latency figures were used to assess the potential E2E latency for digital euro payments, with a particular focus on understanding the time needed for the PSP to perform the necessary processing tasks in digital euro transactions. The outcome of these discussions will be used to ensure that digital euro transactions can be carried out at high speed in line with market and user expectations.

Expert sessions have also been held on dispute management – a key means of ensuring end-user protection in digital euro payment transactions. The establishment of suitable dispute management mechanisms to provide digital euro users and PSPs with technical and functional support for dispute resolution aligns with the mandate set out in the proposed regulation on the establishment of the digital euro²³. Potential disputes can arise for technical reasons (such as wrong transaction amounts or data, as well as duplicated transactions) but can also relate to fraud (such as merchant identity fraud, counterfeit goods and identity theft). The RDG expert session included a discussion on viable alternative ways for possible arbitration bodies to resolve cases that are not solved during the dispute management process. Several options are currently being explored further. The work on dispute management is still going on, and the RDG will continue to be involved in drafting this important element of the digital euro to support end-user protection.

Updates to the E2E flows have also been presented to the RDG. A significant change since the interim version 0.8 of the rulebook reviewed by the RDG in 2024, is the revision of “unhappy flows” (i.e. paths for rejected transactions). These unhappy flows highlight unsuccessful transactions due to functional exceptions occurring when the system is unable to process a transaction due to issues such as incorrect information being entered or insufficient funds in a wallet. In contrast, technical rejections, such as network errors, are included in the implementation specifications of the rulebook. Another important update is the mapping of operational rules to individual steps within the E2E flows, which was also suggested by the RDG. Additional flows and sub-flows have also been created to go alongside newly added user journeys and to improve readability. These additions concern reservation

²² A digital euro transaction conducted with a short-range wireless (frequently referred to as contactless) connectivity technology that enables communication between devices when in proximity.

²³ See, for example, Recital 60 and Article 27 of [Proposal for a Regulation of the European Parliament and of the Council on the establishment of the digital euro, COM \(2023\) 369 final, 28 June 2023](#).

transactions, recurring payments, PSP ID lookups, point of sale payment request validations and holding limit checks.

Finally, the RDG has been informed about interactions with the standardisation bodies on standards that have been identified as potentially suitable for use with the digital euro. These standardisation bodies include the European Card Payment Cooperation (ECPC, governing the CPACE generic card and mobile application), the Berlin Group, Nexo and the European Payments Council (EPC). Common to all those standards is their open, non-proprietary nature with a European base. The ECB regularly engages with these bodies as it is committed to using open standards wherever applicable. This is not solely to ensure compliance with the draft regulation but also to ease the Eurosystem's development of the digital euro and make it easier to integrate market actors. In addition, re-using existing standards would improve interoperability and lead to greater harmonisation of the standards used within the European payments infrastructure. Although interaction with standardisation bodies is progressing, individual technical standards will be formally selected by the Governing Council of the ECB. In addition, work is still being carried out to investigate the extent to which standards will be prescribed or whether they will serve more as reference standards to make implementation as easy as possible. The ECB will continue to engage with the standardisation bodies and to inform the RDG of its progress.

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Next steps

Looking ahead, the next draft of the digital euro scheme rulebook will be shared with the RDG and its constituents so that they can add their comments.

Following on from the version reviewed by the RDG during the first quarter of 2024, this new version will elaborate further on dispute management principles, minimum UX standards and non-functional requirements, which all contribute to establishing a similar or better experience for the user compared with current retail payment solutions. Moreover, a stakeholder management approach will be developed to maintain a broad engagement of the retail payment market for future updates and changes to the rulebook, once operational. An extensive update to the risk management section, covering fraud risk, operational risk and cyber risk will also be included. Finally, the new version of the rulebook will include a first version of the implementation specifications for P2P, e-commerce and m-commerce use cases. This will allow the RDG to better understand and assess the implementation aspects of the digital euro. The review of the next complete draft is crucial as it will give time to RDG members to take a comprehensive view and share the draft with their constituents. In turn, the review will help to further strengthen the draft rulebook and provide the benefit of the market's expertise.

Following the review of the next draft version, further improvements and versions of the rulebook are planned, which will cover areas and requirements that have not yet been fully completed. This will help ensure consistency between the rulebook and the final version of the draft digital euro regulation. It is recognised that, pending the

progress of the legislation, there may be elements that need to remain flexible to accommodate any future adjustment deriving from the legislative discussions.

The draft rulebook will be sufficiently flexible to accommodate any future adjustments arising from the amendments that co-legislators may make to the draft regulation. The ECB's Governing Council will only decide whether to issue a digital euro once the relevant legislative act has been adopted. A new progress report on the work of the RDG will be shared in the third quarter of 2025.