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E-Receipt Rulebook Minimum Requirements for Transmitting E-Receipt Data

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E-Receipt Rulebook

Minimum Requirements for Transmitting E-Receipt Data

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Abstract	<p>The E-Receipt Rulebook has been prepared in the e-receipt working groups of the Real-Time Economy project. The purpose of the document is to clarify cases of use and operating methods so that structured receipts can be forwarded in the e-receipt ecosystem.</p> <p>The E-Receipt Rulebook is based on the principles defined in the RTECO project and it supports the objectives of the Nordic Smart Government project in transmitting cross-border e-receipts.</p> <p>The purpose of this rulebook is to describe the safe transmission of e-receipts in a four-corner model based on and using payment cards as payment instruments. The rulebook describes the basic requirements, responsibilities and obligations of those operating in the e-receipt ecosystem in order to be able to trust the transmission and operation of e-receipts in the market. The rulebook does not restrict the introduction of current and future transmission models or circles of trust.</p> <p>This rulebook will be updated when new technical implementations, such as a circle of trust, new wishes or payment methods, have been presented and are in production. The State Treasury prepares the amendment proposals and convenes a working group.</p>		
Keywords	e-receipt, digital economy, real-time economy		

Version History

Version	Date	Change Description
0.1E	23 August 2021	Updates based on feedback: technical component, integrity and data protection
0.1E	24 September 2021	Updates based on additional feedback: contract structure and technical specifications
0.2E	08 October 2021	Updates based on internal review: added picture of how the buyer's receipts can be transferred to the buyer's systems
0.5E	03 December 2021	Changes to the figures and definitions of the four-corner model
0.6E	10 December 2021	Small working group updates to the text based on comments received

Contents

1	Background, principles and objectives of the E-Receipt Rulebook	4
2	Purpose of the E-Receipt Rulebook	5
3	Roles, responsibilities and terms	6
4	Rights and obligations	8
5	Reference documents related to the receipt.....	9
6	Technical boundary conditions	9
6.1	General.....	9
6.2	Transmission models	9
6.3	Contractual relationships	11
6.4	E-receipt routing mechanisms	13
6.5	Conceptual four-corner model in the current situation.....	15
6.5.1	Exchange of information on registered payment cards between operators	16
6.5.2	Delivery of e-receipts to another actor (operator or other service).....	17
6.6	Conceptual four-corner model when e-Address is enabled.....	17
6.6.1	Configuring the e-Address	18
6.6.2	Attaching an e-Address to a payment transaction.....	19
6.6.3	Delivery of the e-receipt from the seller to the e-receipt operator	19
6.6.4	Delivery of e-receipts to another actor (operator or other service).....	20
7	Ensuring the integrity of the e-receipt.....	20
8	E-receipt operator's use of e-receipt data	21
9	Use of e-receipt in applications using e-receipt data	22
10	Compilation of Statistics	22
11	The binding nature of the E-Receipt Rulebook.....	22
12	Update and maintenance of the E-Receipt Rulebook	23

1 **Background, principles and objectives of the E-Receipt Rulebook**

This document has been prepared in the e-receipt working groups of the Real-Time Economy project. The purpose of the document is to clarify cases of use and operating methods so that structured receipts can be forwarded in the e-receipt ecosystem.

The E-Receipt Rulebook is based on the principles defined in the RTECO project and it supports the objectives of the Nordic Smart Government project in transmitting cross-border e-receipts.

It should also be stressed that the rulebook does not restrict the introduction of current and future models for transmitting or circles of trust in the future. Their introduction will depend on market development and possible future legislation with regard to the circle of trust. This limitation does not exclude the implementation of new innovative solutions related to the transmission of e-receipts when new payment instruments or transmission networks are created.

In the future, the market will choose the most cost-effective and best ways to transmit e-receipts between companies and from companies to consumers.

This version of the E-Receipt Rulebook describes the roles, obligations and responsibilities of the parties operating in the four corner model of the e-receipt ecosystem. The purpose of said parties is to enable the transmission of e-receipts from the seller to the buyer safely, reliably and in accordance with common rules.

The spring 2021 workshops worked on this description and it was possible to define a solution concept for the four-corner model, which at least some of the current actors can use to join the four-corner model. This concept is documented in a technical part that requires further development in terms of details and new technological solutions.

The rulebook will next be updated with regard to other payment instruments and the introduction of the e-Address.

The E-Receipt Rulebook is published on the State Treasury's website for further development comments.

Comments can be submitted and the work of the e-receipt team can be participated in by registering at RTE@valtiokonttori.fi.

2 Purpose of the E-Receipt Rulebook

The purpose is to describe the basic requirements, responsibilities and obligations of those operating in the e-receipt ecosystem in order to be able to trust the transmission and operation of e-receipts in the market.

In the e-receipt ecosystem, the seller delivers the e-receipts via its own e-receipt operator to the buyer's e-receipt operator, which forwards it to the system/application selected by the buyer.

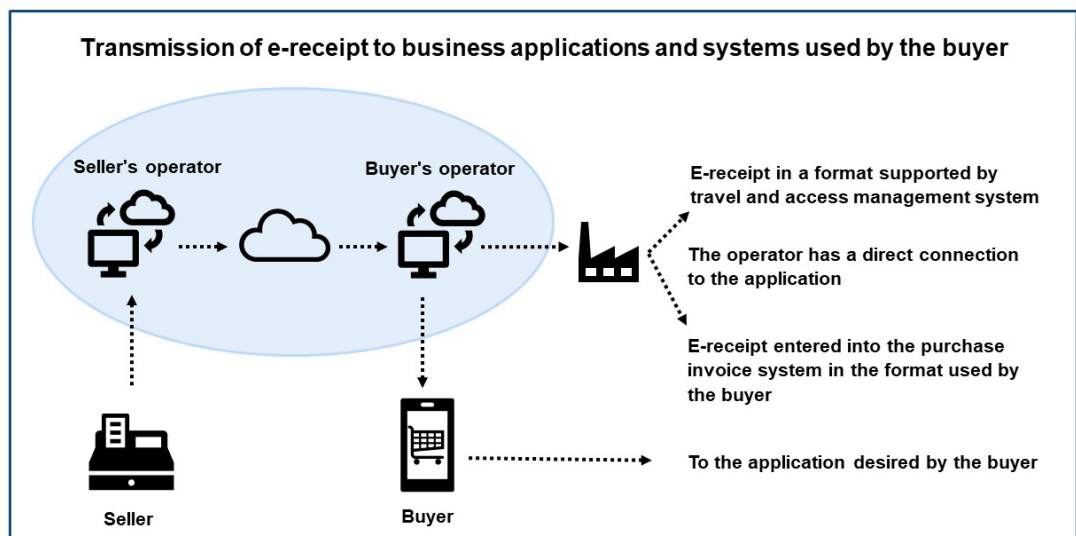


Figure 1 Transmission of e-receipt to business applications and systems used by the buyer

The model shown in the figure is a conceptual, non-technical, four-corner model in which the seller's and buyer's operators inside the ellipse can be replaced by any simpler solution that allows the seller to transmit the receipts to the buyer.

However, the scope of this document does not include describing how the e-receipt will be processed once it has been delivered to the buyer.

The rulebook does not exclude e-receipt transmitting mechanisms that are currently in use or will be developed in the future. The purpose of this rulebook is to describe the safe transmission of e-receipts in a four-corner model using payment cards as a payment instrument. It is therefore a basic model.

This ensures that it is possible to start transmitting e-receipts safely. The authors of the rulebook are aware that ultimately the buyer must be able to determine how and where they want to receive e-receipts. The seller remains responsible for choosing the route through which the e-receipts will be delivered and then transmitting the e-receipt via the party of their choice.

3 Roles, responsibilities and terms

Roles associated with the purchase transaction and their definition

Role	Definition
Buyer	The company, organisation or person ultimately responsible for the purchase. Owner of receipt data.
Seller	The company that produces a receipt from the purchase data and is the controller for the receipt data.
Receipt	A receipt in a structured machine-readable format.
E-receipt operator	Transmits e-receipts in a four-corner model from the seller to the buyer's e-receipt operator. For own customers, the controller if an e-receipt service is provided
Application using e-receipt data	Travel or access control system, purchase invoice processing system in which e-receipt data is used.
E-receipt service	An API or other device used to visualise an e-receipt to a user. Enables forwarding of e-receipts. The e-receipt service is the controller for its own customers.
E-receipt archive	The customer's e-receipts archive, which, for example, the e-receipt service offers to its customers. For own customers, the controller.
E-Address	The address to which the receipt data is forwarded. The e-receipt solutions currently implemented do not use a solution that corresponds to the e-Address, but the identification of the owner of the receipt is based on other types of technology.
E-Address identifier	Identifier used by the buyer to indicate that the receipt for the purchase in question will be delivered to a specific address or application. Not personal data of the buyer.
Unique identifier of the receipt	Unique identifier of the receipt generated in the seller's sales system. For example, a unique identifier generated in the cash register system.

Roles related to the payment transaction

Role	Definition
Buyer	The company, organisation or person ultimately responsible for the purchase. Owner of the delivered receipt.
Seller	The company that produces the purchase data and is the controller for the receipt data. Owner of receipt data.
Holder of the payment instrument	The consumer or the representative of the undertaking, i.e. the holder of the payment instrument used to make the purchase.
Payment channel	A service channel that may have different payment instrument options.
Payment instrument	For example, a payment card.
Payment transaction intermediary (PSP)	Payment transaction broker as defined in PSD2.
User identifier of the payment instrument	A person using the e-receipt service receives an unambiguous user ID in the service. The user ID determines who the receipt is displayed to in the e-receipt service.
Cash register system (POS)	A shop sales system that manages sales transactions.
Payment terminal	A device that reads payment card information and stores a payment transaction electronically.
Issuer	Issuer of the payment card.

Roles related to e-receipt transmission

Role	Definition
E-receipt operator	Transmits e-receipts in a four-corner model from the seller to the buyer's e-receipt operator.
Application using e-receipt data	For example, travel or access control system, purchase invoice processing system in which e-receipt data is used.
E-receipt service	An API or other device used to visualise an e-receipt to a user. Enables forwarding of e-receipts.

4 Rights and obligations

Role	Rights and obligations
Buyer	<ul style="list-style-type: none"> • A consumer customer receives the receipt in an agreed manner to the agreed system • In the event of a purchase, the buyer checks the correctness of the receipt. • A corporate buyer, whose financial administration system the e-receipt for card purchases is entered into, <ul style="list-style-type: none"> ○ makes payment for the purchases to the Issuer ○ Accounting of expenses
Seller	Is responsible for the correctness of the e-receipt, transmits the e-receipt to the address desired by the buyer.
User of payment instrument	Checks the correctness of the e-receipt in the payment situation and possibly updates the necessary additional information to the metadata of the e-receipt in the e-receipt service (cost, cost centre, etc.) or in the financial administration system.
Payment transaction intermediary (PSP)	<p>Transmits the payment transaction to the acquirers of the card transactions.</p> <p>Sends the details of the payment transaction to the e-receipt operator by order of the merchant.</p>
Payment terminal	Reads the card data and sends the card data in connection with the purchase transaction.
E-receipt operator	<ul style="list-style-type: none"> • Transmits e-receipts to its own customers. • Transmits e-receipts belonging to another e-receipt operator as agreed (acknowledgement of receipt, message format). • Is responsible for the integrity of the receipt data in the e-receipt transmission network. • If necessary, combines the payment transaction with the receipt.
Application using e-receipt data	<p>Recipient and user of receipt data.</p> <p>The application may not change the receipt data, additional information related to the receipt is added to the metadata of the receipt.</p>
Issuer	The issuer of the payment instrument.

5 Reference documents related to the receipt

Other specifications and regulations related to the receipt

- Act on the Obligation to Offer Receipts in Cash Trading¹
- The European Cards Stakeholders Group (ECSG) documents² describe the requirements for card-based services in the SEPA payment area.
- Ministry of Transport and Communications report 5/2017 Buyer's rights to receipt data - Boundary conditions, implementation options and recommendations³.
- PCI DSS obligations⁴ for card data processing
- The model for using data fields is described using the Finvoice message⁵ as an example.

6 Technical boundary conditions

6.1 General

The technical part of the E-Receipt Rulebook describes how e-receipts can currently be transferred in a four-corner model between e-receipt operators in card payment. The technical solution is suitable for both B2B and B2C receipts; at this stage, however, the focus is on B2B receipts.

The technical section is based on the spring 2021 workshops, in which stakeholders' technical representatives participated.

In the workshops, a solution concept was defined for the four-corner model, with which at least some of the current actors can join the four-corner model. This concept is documented below, and the concept should be developed in terms of details in the future.

6.2 Transmission models

The two most important actors in terms of the e-receipt are the receipt provider and the recipient of the receipt. Without these, the e-receipt is irrelevant. At minimum, the e-receipt ecosystem requires a solution in which the receipt provider can deliver the e-receipt directly to the recipient of the receipt.

¹ <https://www.finlex.fi/fi/laki/alkup/2013/20130658>

² <https://www.e-csg.eu/scs-volume>

³ <https://julkaisut.valtioneuvosto.fi/handle/10024/79518>

⁴ <https://www.pcisecuritystandards.org/>

⁵ <https://www.finanssiala.fi/en/topics/finvoice-standard/>

In the triangular model, there is an e-receipt operator between the receipt provider and the receipt recipient. In the four-corner model, the recipient of the receipt may have its own e-receipt operator and the receipt is transferred from the seller (the receipt provider) to the seller's e-receipt operator, from which it is transferred to the buyer's (the recipient of the receipt) e-receipt operator, from which it is eventually transferred to the buyer. Please note that the receipt operator could also be the seller itself.

At the conceptual level, the buyer can be any party designated by the buyer to whom the buyer's e-receipt operator delivers the e-receipt. This can be, for example, the buyer's own wallet application or the financial management application selected by the buyer.

The scope of this document does not include how the e-receipt can be further processed once it has been delivered to the buyer.

A conceptual non-technical four-corner model is shown below. In the figure, the seller's and buyer's operators inside the ellipse can be replaced by any simpler solution that allows the seller to transmit the receipts to the buyer:

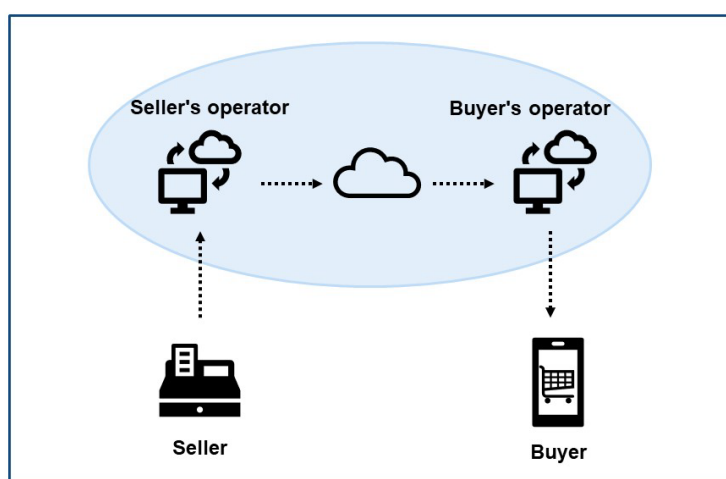


Figure 2. Four-corner model

For the four-corner model to work at least the following is required:

- Mechanism for identifying the final recipient of the artefact to be transmitted (here e-receipt) and its e-receipt operator
- Mechanism for conveying artefacts between e-receipt operators

Typically, the reasoning process works as follows:

- 1) The e-receipt operator receives an e-receipt from its seller customer
- 2) The e-receipt operator checks if the buyer is the operator's own customer
 - a) If the buyer is the e-receipt operator's own customer, the operator transmits the receipt to this customer

- b) If the buyer is not the e-receipt operator's own customer
 - i) The e-receipt operator identifies to which e-receipt operator the receipt should be forwarded
 - ii) The e-receipt operator will forward the receipt to this e-receipt operator, which will forward the receipt to its customer

Both the e-invoicing model and the 2018 RTECO project have defined that the mechanism for identifying the final destination of the receipt is a kind of address field called e-Address.

The e-receipt solutions currently implemented do not use a solution that corresponds to the e-Address, but the identification of the owner of the receipt is based on other types of technology.

If a functional e-Address solution is available, this technical description does not in any way prevent its use. The above description is based on the use of a method (e-Address or other mechanism) to identify the destination of the receipt in the four-corner model.

6.3

Contractual relationships

The following figure shows the possible contractual relationships in the four-corner model:

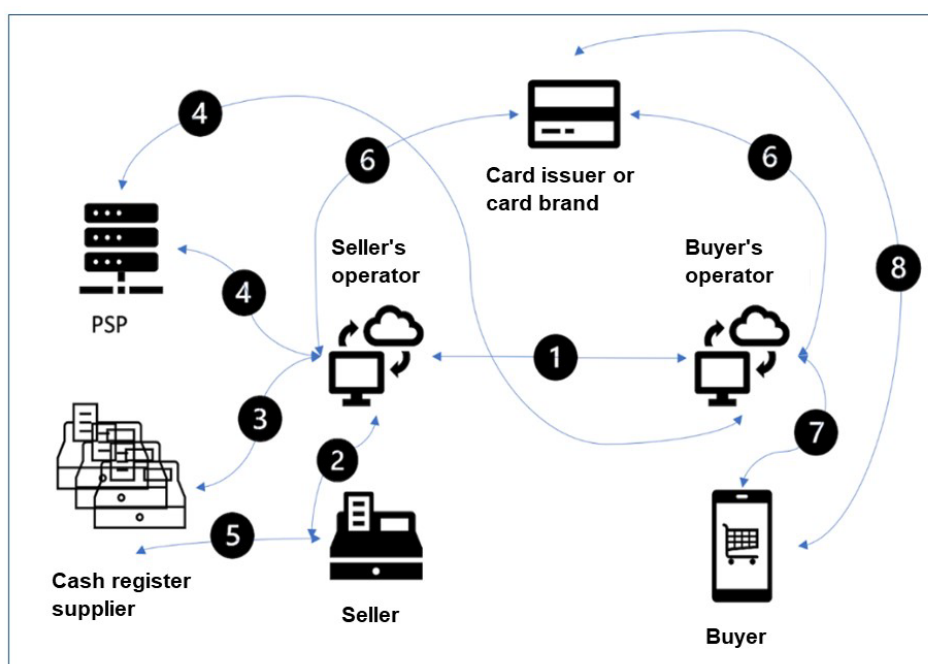


Figure 3. Four-corner model - contractual relationships

The figure shows the possible contractual relationships between e-receipt operators. However, the contractual relationships are determined according to the implementation needs, as a result of which some of the agreements shown in the figure are not required:

1. E-receipt operators must have a mutual agreement on the exchange of e-receipts. The agreement can be either bilateral or based on a joint framework agreement or agreement framework in the field. The agreement must at least

take into account data protection, technical solutions and commercial issues and, if necessary, the requirements of the payment card security standard (PCI DSS).

2. The seller and the e-receipt operator selected by the seller must have an agreement that the e-receipt operator will process and forward receipts produced by the seller. The agreement must at least take into account data protection, technical solutions and commercial issues. It would be important to specify in the contracts whether the seller allows the use of receipts in any way for analysis, marketing or for any purpose other than the transmission of the receipts. The starting point of the agreement must be the collection of individual e-receipts from the seller, unless the contracting parties have separately agreed otherwise. The contracting parties have been identified and it is technically ensured that the seller's receipts are received as agreed.
3. The cash register system supplier and the e-receipt operator may have a contract if the implemented solution requires this. The reasons may include, for example, the necessary software development by which the cash register system supports the e-receipt operator or possibly a receipt archive maintained by the cash register system supplier, to which the e-receipt operator needs access. The necessary content of the agreement depends fully on the solution. The cash register system suppliers must have the opportunity to offer an interface to the e-receipt operator desired by the seller.
4. The e-receipt operator may have an agreement with the payment service provider (PSP) if the solution is based on the e-receipt operator registering the payment cards of its customers to the PSP and receiving information from the PSP about the use of the card and the identification information related to the transaction that can be used to identify the e-receipt from the receipt archive. The agreement must at least take into account data protection, the requirements of the payment card security standard (PCI DSS), technical solutions and commercial issues.
5. The seller and the cash register system supplier must have an agreement if the cash register system supplier offers an e-receipt archive from where the seller's e-receipt operator retrieves the e-receipts. The necessary content of the agreement depends fully on the solution to be used.
6. The e-receipt operator may have an agreement with the card issuer or the card brand. In this case, information on the use of the card is sent to the e-receipt operator from the card issuer or the card brand. The agreement must at least take into account data protection, technical solutions and commercial issues. Card brands and card issuers operate at their own risk, so any PCI DSS requirements come from there.
7. The buyer and the buyer's e-receipt operator must have an agreement. This agreement is created when the buyer registers with the e-receipt service. Typically, this agreement is completely asymmetric, i.e. dictated by the e-receipt operator. The agreement must at least take into account data protection, technical solutions and commercial issues.

The e-receipt operator must have the possibility to transmit the e-receipts to the buyer, for example, through the electronic invoice transmission network or another circle of trust.

Depending on the solution implementation, the buyer can register their card through the card issuer to the e-receipt solution. Typically, this agreement is completely asymmetric, i.e. dictated by the card issuer. The agreement must at least take into account data protection, technical solutions and commercial issues.

6.4 E-receipt routing mechanisms

Daily merchandise stores use their loyalty programs to identify their customers who are in their own e-receipt software. The e-receipt is delivered to the loyalty application. The actual routing is not used here, as the trading group produces the entire infrastructure and the destination of the e-receipt is derived from the loyalty relationship. Every grocery chain produces its own service, and based on working group discussions, the intention is not to combine the services with the four-corner model for B2B receipts. This routing mechanism is not within the scope of this rulebook.

The actual e-receipt operators, i.e. operators who do not produce receipts but transmit them, operate conceptually as follows:

- **Registration**
 - Customer (consumer or company) registers their payment card with the e-receipt operator
 - If necessary, the e-receipt operator registers said payment card with the payment service provider (PSP)

- **Purchase situation**
 - When a buyer uses a registered payment card on a payment terminal, the payment terminal sends an authorisation to the PSP or another similar message indicating the use of the card. PSP forwards this message in the card payment message hierarchy.
 - PSP notifies the seller's receipt operator of the registered payment terminal's authorisation hold or a similar message on which the charge is made; the message contains sufficient information to identify the corresponding receipt for the transaction - typically such information includes the time stamp of the payment transaction, payment terminal identifier, payment transaction amount, transaction reference and the truncated card number. If a payment terminal is completely isolated from the cash register, only the time stamp and amount can be used to identify the correct receipt; each e-receipt operator must resolve its own processing rules for sufficiently reliable identification of the receipt. Upon request, the e-receipt operator must be able to describe its processing rules to its customers.

- **Further processing**

- The seller's e-receipt operator will retrieve from the seller's receipt archive the individual receipt that corresponds to the identifiers of the transaction and transmits it to the buyer's e-receipt operator.
- The buyer's e-receipt operator transmits the receipt to the application specified by the customer (the application selected by the customer from the e-receipt operator's application list)

There are variations to the above, in which, for example, the cash register terminal can deliver the receipt to the e-receipt operator - however, the routing of the receipt is based on the fact that a certain payment card has been registered for the e-receipt and PSP provides the receipt operator with sufficiently identifying information about the payment transaction made with the card.

However, there are more actors in the payment card infrastructure that operate in the hierarchy above the PSP, i.e. "behind the PSP". Such actors include card issuers and card brand networks (e.g. VisaNet). At least some e-receipt operators cooperate with such broader background network and receive event information from it in a similar manner as from the PSP. The card brand networks process (almost⁶) all events related to the card brand in question, in which case the coverage is significantly wider than the event coverage offered by PSP. In conceptual terms, however, the information received by the receipt operator is almost the same as in the current implementations, so it is not essential for this rulebook where the receipt operator receives information about the payment transaction and the receipt generated/to be generated. If the e-Receipt operator works with a party above the PSP, it is also possible to have newer payment solutions based on payment cards, such as Apple Pay and Google Pay, covered by e-receipts because these higher parties can identify and link the derived card numbers used by newer payment solutions to the original card number.

The end situation is that the seller's e-receipt operator has an e-receipt, which the seller's e-receipt operator can connect to the registered payment card and thus with the party that registered the payment card. In other words, information is available on whose receipt it is and where it must be delivered. This information is conceptually equivalent to the e-Address.

At the time of writing, no solutions based on an e-Address are used in e-receipt implementations in Finland. Once such a solution is received, e-receipts can be processed as follows:

- The Buyer provides their e-Address in connection with the payment transaction
 - A loyalty identifier can contain an e-Address
 - The e-Address can be transmitted optically in connection with a payment transaction (QR code or equivalent)

⁶ If the acquirer and the issuer are the same party, the transaction may not cycle through the card brand network

- The e-Address can be transmitted by radio in connection with a payment transaction (NFC, BT or equivalent)
- The e-Address can be provided with a separate smart card to a payment terminal (such as confirming a loyalty relationship)
- The e-Address can be transmitted in some other way in connection with a payment transaction
- The e-Address is attached to the e-receipt
 - The e-Address can be part of a structured receipt (for example, a Finvoice message)
 - The e-Address can be added to the digital envelope surrounding the e-receipt
 - The Seller transmits the e-receipt and the e-Address to its own e-receipt operator
 - The final situation above is that the seller's e-receipt operator has an e-receipt and an e-Address that enable the seller's e-receipt operator to route the receipt.

6.5 Conceptual four-corner model in the current situation

The conceptual four-corner model described below is generic and enables several actors to join the four-corner. The model is based on the current situation and the current way in which receipt operators and potential new operators can join the four-corner model.

Theoretically, receipt operators and PSP operators may have at least the following operating models:

- PSP can register one e-receipt operator's cards and submit the data to this receipt operator only
- PSP can register cards from multiple e-receipt operators and provide information to these e-receipt operators
- E-receipt operator can collaborate with one PSP
- E-receipt operator can collaborate with multiple PSPs

In addition, the above can be extended to solutions in which receipt operators cooperate with an operator higher in the hierarchy than PSP. Such operators include, among others, card issuers and card brands.

A conceptual four-corner model is needed in situations where the e-receipt operator does not receive information about all transactions in payment cards belonging to its customer base. Such a situation arises, for example, when the e-receipt operator only cooperates with PSP-A and the payment transaction is processed in PSP-B.

The conceptual four-corner model is based on e-receipt operators sharing card numbers (PANs) for payment cards registered in their service with each other and

each e-receipt operator registering for its PSP collaboration partner the card numbers of both its own and other e-receipt operators in the e-receipt service.

For payment transactions and e-receipts, the model works as follows:

- PSP provides the e-receipt operator with information about the payment transaction
- The e-receipt operator retrieves the corresponding receipt from the merchant's receipt archive (or receives the receipt in some other way)
- The e-receipt operator checks the registration of the payment card attached to the e-receipt:
 - If the card is registered with the e-receipt operator's own customer, the e-receipt is routed according to the e-receipt operator's internal rules
 - If the card is registered to another e-receipt operator, the receipt and the associated metadata will be delivered to this other e-receipt operator

The above conceptual model implements the four-corner without an e-Address included in the structured data.

Implementing a conceptual model that is technically functional requires defining the details of the issues presented in the following paragraphs. It should also be noted that in addition to technical implementation, the four-corner model requires extensive agreement, in which the operators' information security standards, such as the Payment Card Industry - Data Security Standard (PCI DSS) obligations, must be taken into account.

6.5.1 Exchange of information on registered payment cards between operators

The exchange of payment card information requires both an agreement between the e-receipt operators and a technical description on how to exchange card numbers. The technical description shall include at least the following items:

- Encryption solutions to be used⁷
- Changing encryption keys
- Transfer mechanisms
- Format of the data to be transferred
- Use cases:
 - Card addition (1-n)
 - Card removal (1-n)

⁷ The PCI DSS standard requires *strong encryption* for both card number storage and transfer.

6.5.2 **Delivery of e-receipts to another actor (operator or other service)**

Transmitting e-receipts requires both an agreement between the e-receipt operators and a technical description on how to transmit e-receipts. The technical description shall include at least the following items:

- E-receipt structure
 - Common JSON format
 - Common XML format (Finvoice)
 - Required fields
 - Optional fields
- E-receipt metadata structure
 - Common JSON format
 - Common XML format
 - Required fields
 - Optional fields
- API description of the transfer of an individual e-receipt
 - API Description
 - Authentication (API key)
- Attachment and link forwarding
 - Links and attachments may be included to the e-receipt.

According to this description, the e-receipt can be delivered to the operator, the buyer or a party specified by the buyer (either through the buyer or directly as defined by the buyer to the operator).

Metadata related to e-receipts include information related to routing and information provided to financial administration systems.

If a Finvoice record description is used in the visualisation of the e-receipt, a common e-receipt supporting scheme and style files were created in autumn 2021 for the Finvoice electronic invoice scheme, in which the headings correspond to the e-receipt needs and the ePIDetails structure has been changed to optional, as the information required for credit transfers is not available for all cash register programs.

6.6 **Conceptual four-corner model when e-Address is enabled**

The 2018 RTECO project described an e-Address as a pair with an e-receipt operator identifier and a customer identifier that is relevant to this e-receipt operator. The above is semantically the minimum level, because for routing, the receipt must be delivered to one of the e-receipt operators, who in turn must identify the customer to whom the receipt belongs.

Technically, however, the e-Address can only contain the buyer's identifier; in this case, there must be a mechanism in use, such as a directory, from which the e-receipt operator of the e-Address can be determined. Regardless of the solution, the e-Address for the e-receipt eventually indicates in a way or another the buyer's e-receipt operator, which in turn can connect the e-Address to its customer.

There is currently no e-Address suitable for all payment methods. The direction of the e-receipt used in this description from the seller to the buyer is based on other implementations.

The conceptual four-corner model described below is generic and implementation pursuant to it can be carried out using a variety of e-Address techniques. The model below is suitable for use in parallel with the model described in chapter 6.4.

The model works as follows:

- Seller receives the buyer's e-Address in connection with the payment transaction
- The seller attaches the e-Address to the e-receipt
 - The e-Address can be part of a structured receipt
 - The e-Address can be attached to a separate frame of a structured receipt (envelope)
- The seller delivers the e-receipt to its e-receipt operator
 - The seller can send a receipt
 - The e-receipt operator can retrieve the receipt from the seller's receipt archive
- The e-receipt operator analyses the e-Address of the e-receipt
 - If the e-Address refers to the e-receipt operator's own customer, the e-receipt operator delivers the e-receipt itself to the buyer
 - If the e-Address refers to another e-receipt operator, the e-receipt operator delivers the e-receipt to the referenced e-receipt operator, which delivers the e-receipt to the buyer

To make this conceptual model technically functional, it is necessary to define the details of the issues presented in the following paragraphs.

6.6.1 Configuring the e-Address

An e-Address can be any identifier that can be unambiguously associated to the buyer. There are several options for the format of the identifier. The following list contains examples:

- The e-Address contains only the buyer identifier; if the operator receiving the e-receipt is not the buyer's e-receipt operator, the buyer's e-receipt operator is searched in the directory
- An e-Address is a pair of data in accordance with the RTECO project with a buyer identifier and an e-receipt operator identifier; the buyer identifier can be such that only the buyer's e-receipt operator can connect the identifier to the buyer
- An e-Address can be a dataset that contains information about the buyer (but only in a certain context) and routing information where the e-receipt should be delivered; for example, a connection invitation used by Findy in the format of Uniform Resource Locator (URI), which allows the receipt to be routed directly to the buyer's receipt wallet.

The latest e-Address model presented above differs from the four-corner model in that the buyer and the buyer's e-receipt operator form the buyer's digital wallet.

6.6.2 Attaching an e-Address to a payment transaction

The e-Address must be made available for use in the e-receipt generating system. If the e-Address is not tied to a payment instrument, attaching the e-Address to a payment transaction is a separate measure by which the e-Address is delivered to the payment system in one way or another.

There are several options for delivering an e-Address, including:

- The e-address can be transmitted by radio (e.g. NFC and Bluetooth)
- The e-Address can be transmitted via an optical reader (e.g. QR code or bar code)
- The e-Address can be transmitted using a smart card, the payment terminal of which reads (e.g. loyalty cards); the corresponding information can also be attached to the payment card, in which case the payment terminal reads both the information needed for the payment transaction and loyalty information, including the e-Address, from the same card.

6.6.3 Delivery of the e-receipt from the seller to the e-receipt operator

As part of the process, the conceptual model described in chapter 6.4 includes the delivery of the e-receipt to the e-receipt operator. In a model where the e-Address is forwarded as part of a payment transaction, such a solution is not ready because the e-receipt operator is not automatically informed about the payment transaction.

When writing this, there is no concrete implementation in which the e-Address would be transmitted as part of the payment transaction and after that the e-receipt would be transmitted to the given e-Address.

There are several possibilities to transmit an e-receipt from the seller to the e-receipt operator.

At the conceptual level, the following two methods are presented:

- Seller transmits the e-receipts to its e-receipt operator via API
- The e-receipt operator retrieves the e-receipts from the seller's receipt archive

Technical matters to be agreed upon in the API model include the following:

- Authentication Solution
- API Description

Technical matters to be agreed upon when retrieving receipts from the receipt archive include:

- Authentication Solution
- Interface to the receipt archive

6.6.4 Delivery of e-receipts to another actor (operator or other service)

At this point, the e-receipt has been delivered to the e-receipt operator. The operation continues as described in chapter 6.4.

7 Ensuring the integrity of the e-receipt

Before starting this description work, the stakeholders handled possible misuse cases related to e-receipt. The consensus on the assessment of cases of misuse was that the receipts do not include integrity mechanisms based on electronic signatures. The consensus was that an adequate integrity mechanism can be created so that the buyer is not given easy access to structured receipt data, i.e. the applications only show the buyer a receipt image that is created from the receipt data.

E-receipt operators have the possibility to make the necessary conversions, but no changes are allowed to the actual receipt data. E-receipt operators also do not produce a product for end users that would enable the editing of structured receipt data. This does not prevent the development of applications where you can add, change, or delete e-receipt structured (separate from receipt) metadata.

It is possible to use stronger methods to verify authenticity of e-receipts. These methods are typically based on cryptographic solutions.

A typical cryptographic solution is the cryptographic signing of the e-receipt or its elements. This solution can be implemented either through a centralised public key infrastructure or through a decentralised public key infrastructure. A centralised public key infrastructure typically requires a certification authority solution, the implementation of which is a very significant investment, as the verification of trust is tied to a single location (certification authority). A decentralised public key system requires diversification to a sufficient number of parties, as individual nodes are typically not protected at the same level as the certification authority for the centralised solution.

The centralised public key infrastructure is mainly based on the X.509 standard. Today, decentralised public key systems are usually based on blockchains.

The cryptographic solution requires the seller to invest in the signature solution. The signature software must be connected to the e-receipt system, and the signature key must be protected from both internal and external attackers. In addition, appropriate processes are required to obtain the signature key. At the time of writing, there is no suitable commercial or non-commercial service for this purpose.

The cryptographic signature of e-receipts alone is not enough to authenticate e-receipts, but the signature must be verified when the receipt is validated. This requires that the validator has access to the signatory's public key and to the software

that performs the validation. At the time of writing, there is no suitable commercial or non-commercial solution for this purpose.

It is also possible to verify the accuracy of the e-receipt by using an authoritative validation service provided by a third party. Such a solution can be based on a number of different approaches; the following are two alternative methods:

- The e-receipt may have a cryptographically strong checksum, which is easy to calculate from the data on the receipt. Since any party that has changed the e-receipt can calculate a new checksum and add it to the receipt itself, it must be possible to validate the checksum by an authoritative third party. One of the solutions presented is that the checksum would always include the checksum of the previous receipt as a component; in this case, the checksums of the receipts would form a blockchain, the changing of which can be detected. However, this blockchain solution is mainly intended to authenticate receipts when the seller's activities are examined, as the seller has access to all of its own receipts. As it is not possible for the party handling the receipt to access the entire blockchain, the authenticity of the receipt checksum must be asked from a reliable third party. At the time of writing this, there is no practical implementation of how the e-receipt processor could take advantage of the blockchain based checksum on the e-receipt.
- The verification could be carried out in a service to which a structured receipt can be sent and the service responds if the receipt has been changed. At the time of writing this, such a service does not exist.

8 E-receipt operator's use of e-receipt data

E-receipt data can only be used to transmit an essential part of a receipt. Other use has been separately agreed upon between the parties.

E-receipt data is personal data because it contains an element corresponding to the e-Address (structured information or its framework) that can be attached to an individual person (although in theory it is possible to link an e-Address to an organisation, in practice all e-receipt use cases are such that the e-receipt is linked to an individual person).

Legislation on personal data must be taken into account in the processing of personal data. At least the following must be taken into account in the processing of e-receipt data:

- The seller and the e-receipt operator must have an agreement on the processing of personal data and other data.
 - For some receipts, the agreement can be a mere processing agreement (for example, the e-receipt operator has access to the seller's receipt archive, where the e-receipt operator retrieves all receipts and contractually only destroys those e-receipts that do not belong to the customers of the e-receipt operator).
- The e-receipt operator and buyer must have an agreement on the processing of personal data.
 - The agreement must also cover any transfers of e-receipts directly to the buyer's service provider (e.g. company card receipts are delivered

directly to the financial administration service).

- The e-receipt operators must have mutual agreements on the processing of personal data.
 - This can be a processing agreement under which the e-receipt operator can only forward the receipt.

9 Use of e-receipt in applications using e-receipt data

Applications using the e-receipt data content should support the principles of this description, which have also been compiled in one of the user working groups of the eInvoice Forum:

- Wallet services only visualise the e-receipt to the user, the user cannot make changes to the e-receipt data.
- Links on the e-receipt can be used.
- No marketing material should be transmitted as an attachment to the B2B channel.
- It is possible to forward the e-receipt in structured form.
- In the wallet application, the user decides which e-receipts are forwarded to another application.
- The user can receive e-receipts for several payment instruments in the wallet application.
- Possibility to ensure that the e-receipt has not already been forwarded.

10 Compilation of Statistics

The e-receipt market is to be monitored in the future. The e-receipt operators should compile statistics on the number of e-receipts and the number of companies offering e-receipts using a jointly defined statistical form. The definition of statistics will begin in autumn 2021.

Compilation of statistics on the number of e-receipts can only be published when there are several e-receipt operators.

11 The binding nature of the E-Receipt Rulebook

The parties operating in the e-receipt ecosystem have been involved in defining the E-Receipt Rulebook and the minimum requirements for transmitting e-receipts. All interested parties have the opportunity to participate in the working groups. The rulebook is not an agreement in itself, the parties may refer to the rulebook in their own agreements.

E-receipt service providers can, for example, state on their own websites that they comply with the rulebook and the responsibilities and obligations described therein.

The State will require the sellers in card payments to comply with section 4 Rights and obligations of this rulebook. The Real-Time Economy project will examine the need for possible accession criteria, an agreement and common terms, for example, as the task of the PEPPOL authority.

12 Update and maintenance of the E-Receipt Rulebook

This rulebook will be updated when new technical implementations, such as a circle of trust, new wishes or payment methods, have been presented and are in production. The State Treasury prepares the amendment proposals and convenes a working group.

Requests, corrections and changes can be emailed to RTE@valtiokonttori.fi During the Real-Time Economy project, the aim is to specify in more detail the maintenance and administrative model of the description.



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