



# **Real-Time Economy Project, final report**

Real-Time Economy | 18 December 2024



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## Summary of the final report

The Real-Time Economy project was implemented in 2021–2024 with funding from the EU's Recovery and Resilience Facility (RRF) and as part of Finland's Sustainable Growth Programme. The project contributed to the objectives of Prime Minister Orpo's Government Programme on moving towards a real-time economy. The aim of the project was to promote real-time economy, in which the financial information of companies, such as procurement messages, invoices and receipts, is automatically transferred in a digital, structured format between different parties. This reduces manual work, streamlines processes and enables significant cost savings for both companies and public administrations. In addition, the project promoted the goals of the Nordic Smart Government and Business programme in Finland.

### Key objectives and results:

- Real-time economy infrastructure:** The project facilitated conditions for the sharing and automation of financial data and the implementation of digital wallet services for companies. The Finnish Peppol authority was established to promote the use of the international Peppol information exchange infrastructure in Finland. Production capabilities for central government for the processing of digital procurement messages were built. Services for receiving digital financial statements from businesses were developed.
- Cost saving potential:** According to studies carried out in the project, the extensive use of digital documents will enable savings of almost EUR 6 billion per year by 2030. It is estimated that the centralised data exchange solution will bring annual benefits of approximately EUR 430 million. The majority of the cost benefits are realised for businesses. The use of digital business documents significantly increased during the project. The project achieved the volume targets in increasing the utilisation rate of e-invoices and e-receipts between organisations. The share of e-invoices and e-receipts is approximately 93% and 20% respectively.
- Digital solutions:** Structured business documents, opportunities for companies to use digital wallets, data sharing and opportunities to utilise data were tested in dozens of trials during the project. In addition, several customer insight studies related to digital solutions were conducted. The functionality and benefits of digital solutions were found to be significant for businesses and authorities. The costs of introducing digital solutions were found to be moderate in the trials. Guidelines for companies and public administration were produced, trainings were organised and marketing and communication campaigns were carried out to accelerate the adoption of digital solutions.
- Interoperability:** The solutions were designed to be compatible with international and EU standards, which promotes businesses' international competitiveness. In the project measures, different levels of interoperability in accordance with the European Commission's Interoperability Framework were taken into account.
- Ecosystem development:** The project developed a joint management model and tools for the real-time economy ecosystem, which ensure the continuous development of real-time economy in cooperation between private and public sector actors. The model includes actors' responsibilities, roles and cooperation principles.

In addition, a number of preliminary legislative studies and studies related to information security and data protection were carried out.

**Vision 2030:** Finland has a fully digitalised business economy ecosystem that works seamlessly both nationally and internationally. This enables businesses to have better predictability and risk management in their operations, new business opportunities, smooth transactions with authorities and significant growth in competitiveness. For the authorities, this brings improved operational efficiency and better services for businesses. The implementation of the real-time economy will improve efficiency in operations and processes for both businesses and authorities, increase productivity and bring significant cost savings at the society level.

### **Key recommendations**

The real-time economy ecosystem is part of the broader ongoing data economy development. For many businesses, the digitalisation of documents is the first step towards value-added exchange of information. The introduction of real-time economy solutions will serve as a stepping stone for businesses towards more data-driven and profitable operations and increased competitiveness. The project recommends that the further development of digitalisation should be gradually advanced, taking into account the broader data economy as a whole and the existing building blocks that enable digitalisation.

The Real-Time Economy project has established the conditions and structures for implementing the work towards Vision 2030. A roadmap for 2025–2030 was drawn up to serve as a basis for further work after the project's conclusion. The roadmap presents the following steps towards the expansion of real-time economy. In the next few years, investments should be made in the development and broad-based introduction of structured business documents, in reducing businesses' administrative reporting burden and duplication in reporting, and in facilitating the use of digital wallets for businesses. The changes require goal-oriented cooperation and commitment from private actors and public administration. The project recommends that the implementation of real-time economy be systematically promoted in Finland in order to achieve the benefits stated in Vision 2030.

## Terms used in the final report

Term	Description
Digital or electronic business document	In the project, a digital or electronic business document refers to a structured e-receipt, procurement message or e-invoice.
e-receipt	A standardised electronic receipt in structured format. E-receipts can be transmitted in structured format between computer programs.
European standard, EN standard	EU standard EU16931 on eInvoicing, known as the European standard.
Procurement message	A message in structured (machine-readable) format related to procurement processes. Procurement messages are used by organisations to share information in order and delivery processes, and they concern product catalogues, orders, order confirmations and deliveries.
Peppol	An international network for the electronic transmission of business documents through which parties can exchange electronic business documents in accordance with the Peppol specifications directly from their systems.
Real Time Economy, RTE	An entity, or an ecosystem, in which structured documents created by businesses' financial departments are transmitted between the members of the ecosystem in a timely and automated manner.
Structured data	Structured data refers to a standardised dataset/document that is machine-readable.
Transaction data	Data generated in a business process, such as data from purchases and orders.
E-invoice	An electronic invoice whose data are transmitted in a machine-readable format, typically as an XML message. An e-invoice can also be displayed on the computer screen as a document resembling a paper invoice. E-invoices are usually sent from the invoicing party's financial administration software, but an enterprise resource

	<p>planning system or an e-invoicing website can also be used.</p>
<p>XBRL GL (eXtensible Business Reporting Language, Global Ledger)</p>	<p>An international standard for the electronic representation of accounting (transaction level) exports in financial systems in a standardised format.</p>
<p>Once-only principle</p>	<p>The once-only principle essentially means that the same information does not need to be reported in different formats to different authorities. For example, a business could submit its information to one authority, which forwards the information to any other authorities that have the right to access that information. The first reporting authority can vary. Alternatively, the once-only principle can be implemented by enabling information to be sent directly from a business's financial system to multiple authorities for different purposes. The information needs and the requirements for the exchange of information are jointly defined so that businesses do not face additional administrative burdens due to different reporting needs.</p>

**Abbreviations used in the final report**

Abbreviation	Description
B2B, B2G, G2B	Business to Business, Business to Government, Government to Business (as parties of business transactions)
CEN	European Committee for Standardization
DVV	Digital and Population Data Services Agency
EIF	European Interoperability Framework
EU	European Union
EWC	EU Digital Identity Wallet Consortium
NSG&B	Nordic Smart Government and Business, a programme promoting real-time economy. Previously known as NSG, Nordic Smart Government
LVM	Ministry of Transport and Communications
PRH	Finnish Patent and Registration Office
RRF	The Next Generation Resilience and Recovery Facility of the European Union
RRP	The Next Generation Resilience and Recovery Plan of the European Union
TEM	Ministry of Economic Affairs and Employment
VM	Ministry of Finance
UM	Ministry for Foreign Affairs
RTE project	Real-Time Economy project



## 1 **Background and purpose of the project**

The Ministry of Economic Affairs and Employment set up the Real-Time Economy project (“the RTE project” or “the project”) to develop digital economy and real-time economy for businesses in the period between 15 June 2021 and 31 December 2024. The project is part of Finland’s sustainable growth programme, which supports ecologically, socially and economically sustainable growth. The programme is designed to enhance competitiveness, investment, capability uplift as well as statistical reporting, research, development and innovation. The RTE project was funded by the EU’s Next Generation Resilience and Recovery Facility (RRF).

Real-time economy refers to economic transactions based on digital structured information and its processing. The digitalisation of businesses’ financial management and of business documents generated in purchases and sales transactions is a prerequisite for the development of real-time economy.

In a real-time economy, businesses can use structured information and digitalisation to make their operations more efficient, reduce manual work and streamline their regulatory reporting. By using structured information, businesses get a better view of how their business can develop and how to anticipate and manage risks more efficiently. Business-to-business activities become more efficient when processes and systems are interoperable and highly automated. Structured data creates new business opportunities for service providers. A well-functioning real-time economy service package enables the development of automation and cost savings also for authorities using the data. A joined-up real-time economy increases the competitiveness of businesses both nationally and internationally, improves the efficiency of governmental functions and increases productivity in society as a whole.

Interoperability is a key objective in the development of real-time economy. Interoperability refers to the ability of actors, processes and information systems to function and communicate in a way that enables them to use and understand each other’s information. The European Commission’s European Interoperability Framework (EIF), which guides the development of interoperability at four different levels, was applied in the RTE project. Each of the levels should be taken into account when developing interoperability:

- Legal interoperability ensures that organisations operating under different legal frameworks can interact with each other. Europe aims to harmonise regulation in the Member States by means of directives and their national implementation.
- Organisational interoperability refers to the harmonisation of operating methods and processes so that different organisations can achieve shared common goals that benefit all parties.
- Semantic interoperability means that the exact meaning of exchanged information is clear, understood in the same way by all parties and unchangeable.
- Technical interoperability means that the technical implementation of information systems and communications is agreed together so that interaction and the exchange of information between systems is possible.

The development of real-time economy in Finland began in 2006. Notable projects preceding the RTE project include Full SEPA (2006-2008), Taru 2014, Taltio 2016, TALTIO eReceipt, TALTIO integration and data warehouse, TALTIO accounting services, NSG 2.0 2017, RTECO 2018, Digital Accounts and eReceipt Guidelines and NSG 3.0 2018. These projects have served as drivers and enablers of real-time economy and laid a strong technical and standardised foundation for the further development of real-time economy.

The Nordic countries' common real-time economy has been intensively advanced by the 2021–2024 Nordic Smart Government and Business (NSG&B) programme (<https://nordicsmartgovernment.org/>), which sought to assist SMEs in the Nordic region through real-time economy opportunities. The RTE project has ensured the national implementation of the NSG&B targets in Finland.

Similar developments promoting real-time economy and interoperability are ongoing in other EU countries and globally. For example, the European Union's objective of reducing administrative burden by 25% in regulatory reporting involves the development of interoperability. Administrative burden and its growth can be curbed by improving regulatory reporting processes, for example, by eliminating duplication and developing automation between authorities and stakeholders.

Real-time economy solutions have a significant impact on Finland's competitiveness and improved productivity. The purpose of the RTE project was to create solutions and structures that promote real-time economy and help to increase digitalisation in businesses and society as a whole, improve opportunities to utilise data and increase productivity.

## 1.1

### Vision 2030

The RTE project's vision is a national, secure real-time economy ecosystem that offers interoperability with other Nordic countries and EU member states by 2030. Structured orders, e-invoices, e-receipts and other business data are transmitted between parties in a seamless and secure manner in real time. The same structured information created in the daily business operations can be utilised efficiently by and between businesses, in public administration and in society as a whole. Real-time data can be used to create new innovative services. Businesses can engage in international trade more easily, and export opportunities and competitiveness will increase. Small businesses will also be able to produce and utilise structured information. According to the vision, Finland will be a pioneer in real-time economy and the most competitive operating environment for businesses by 2030. (Figure 1)



**Figure 1:** Many uses of structured cumulative data

By 2030, the entire life cycle of businesses will be digitalised. Businesses can use digital identity and wallet solutions, and they are able to operate digitally from the outset. Digital services support businesses across their life cycles.

Essential aspects of the vision's aim of promoting the competitiveness of businesses through digitalisation include structured information, the improved efficiency of financial data flows, interoperability, and reduced administrative burden. In the real-time economy ecosystem, value is created by the seamless flow of financial information in financial administration processes, between businesses, and between businesses and authorities.

A common real-time economy ecosystem and infrastructure will enable the creation of solutions that work across all sectors. This means that businesses have access to highly interoperable services that are easy to use.

The vision of the Real-Time Economy project is also part of Finland's Digital Compass national strategic roadmap to 2030 ([Digital Compass action plan](#)). According to the Digital Compass roadmap, Finland will be a leading country in combining digital platforms and technologies and an attractive investment destination in 2030.

## **1.2 Government programmes**

The RTE project was launched during Prime Minister Marin's government term. The aim of Marin's government was to promote the transition to real-time economy and make Finland a leading market in real-time economy.

According to Prime Minister Orpo's Government Programme, the Government will support the transition towards a real-time economy, for example, by promoting possibilities for business documentation, such as e-invoices and e-receipts, to be securely transferred between parties digitally in real time. According to the Government Programme, the Government will focus on cooperation between branches of government and promote the flow of information between the different information systems in use in public administration. The Government Programme states that transactions with authorities should be based on the once-only principle.

The programme of Prime Minister Orpo's Government also includes other objectives that promote digitalisation relating to the development of public administration operations. The aim is to fully seize the potential offered by new technologies and digitalisation.

## **1.3 Project funding and RRF objectives**

The RTE project was funded by the EU Recovery and Resilience Facility (RRF). The objective of the RRF is to promote the economic, social and territorial cohesion of the Union and to improve the resilience of the Member States. The aim is also to reduce the social and economic impacts of the COVID-19 crisis and to support the green transition and the digital transition.

The investment targeted at the RTE project was designed to help create common solutions and structures to facilitate the exchange of digital financial information between organisations in a machine-readable structured format (e.g. e-invoices, e-receipts, procurement messages and financial statements) in accordance with the real-time economy project. The exchange of structured business information supports the automation of processes that have a positive impact on productivity in both the public and private sectors, while at the same time promoting the digitalisation of central government and society as a whole.

## **1.4 Nordic Smart Government and Business**

The Nordic countries share a vision of the Nordic region as the most sustainable and integrated region in the world by 2030. The NSG&B's vision was to create value for small and medium-sized enterprises by enabling the availability, usability and interoperability of real-time business information so that data can be used to create innovations and growth across the Nordic region. This means lighter administrative burden for small and medium-sized enterprises, better use of data in decision-making, innovative new services and easier statutory compliance. For the authorities, it offers better quality of data and easier monitoring. Markets will have new business opportunities from the use of high-quality real-time data.

The NSG&B 4.0 programme ran from spring 2021 until the end of 2024. The vision and objectives of the RTE project were aligned with the vision and objectives of the NSG&B programme. The RTE project contributed to the national implementation of NSG&B's objectives.

## **2 Project objectives**

### **2.1 Objectives identified in the decision to set up the project**

According to the decision to set up the RTE project, (Ministry of Employment and the Economy, 14 June 2021, Appendix 1), the aims of the project were as follows:

- 1 promote the digitalisation of companies by facilitating the generation and automated transfer of electronic financial administration documents between systems and the management of corporate finances
- 2 create a basis for an ecosystem that enables the automated transfer of financial data and the production of services supporting it
- 3 promote primarily the creation of market-based solutions and an infrastructure to enable seamless, real-time and secure automated transfer of data
- 4 enable the establishment and operation of a company digitally and create a digital identity for the company.

A key starting point in the RTE project was to develop solutions in cooperation between private and public sectors so that the project's approaches and solutions are based on the practical consideration of businesses' needs.

The aim was to define a management model for the exchange of information and the related needs and parties responsible for the tasks. According to the objectives, the infrastructure entity is implemented by the responsible parties specified in the project. In addition, the aim was to build central government capabilities for receiving electronic documents, to coordinate the authorities' information needs, to standardise the information content and to support their adoption in businesses.

According to the project decision, the purpose of the project was to solve issues related to the interoperability and technology of the real-time economy ecosystem, the operation and processes of financial administration, the organisation and the management model, and to assess the need for legislative changes.

The focus of the RTE project was to promote real-time economy solutions including business-to-business, business-to-government, and government-to-business (B2B, B2G, G2B). The project did not include solutions involving natural persons.

In the early stages, the project concretised the objectives identified in the project decision into more detailed objectives and outputs in the target state document. The project steering group approved the target state document in December 2021.

The target state document was updated in autumn 2022, and the project steering group approved the updated document in December 2022. After that, changes were made to the objectives and outputs in accordance with the change management procedure of the project, which meant that the changes were discussed and approved by the project's operational steering group and, if necessary, by the steering group. No significant changes were made to the objectives identified in the project decision.

The detailed objectives of the project are described in the target state document (Appendix 2).

## 2.2 RRF targets

[In the operational arrangements between the European Commission and Finland](#), the European Commission set the following two targets for the RTE project: [Countersigned – Finland – RRF – OA and annex.pdf \(europa.eu\)](#):

- 1 The Minimum Viable Ecosystem (MVE) has been successfully established in a production environment, based on common documented rules. It allows for the circulation of e-invoices in a structured machine-readable format to increase process automation.

The date of completion for the milestone was set to Q4/2022.

- 2 The standards and procedures for the exchange of electronic business information have been defined and are described in the final project report. The basic infrastructure allows for the circulation of digital business information in structured form, based on end user consent, covering the following elements: e-invoices - e-receipts - procurement messages. The pilot test on the exchange of digital business information has been successfully completed with at least two private operators (accounting software vendors and/or service providers) and two public agencies.

The date of completion for the milestone was set to Q4/2024.

## 2.3 Objectives of the NSG&B programme for the RTE project

The aim in the RTE project was to design and develop solutions that are interoperable in the Nordic countries and internationally. The RTE project was responsible for promoting and implementing NSG&B's vision and objectives nationally in Finland. The objectives of NSG&B were built into the objectives of the RTE project. The only specific objective for the RTE project directly from NSG&B was to pilot the use of cross-border e-receipts in line with the NSG&B target by the end of 2023.

All persons participating in the NSG&B programme from Finland (approximately 15 people) also worked in the RTE project within a specified allocation. One sub-area of NSG&B (Solution Area Open accounting and Simplified reporting) was coordinated by a Finnish project leader. The project director of the RTE project served as Finland's national lead in the NSG&B. The members of the NSG&B steering forums (Change Advisory Board CAB and Steering Group STG) were also members of the steering forums of the RTE project. In practice, having the same personnel ensured synergies between the projects, the consistency of objectives and outputs, and the development of interoperable solutions between the RTE project and the NSG&B programme.

### **3 Key dependencies**

There were several external dependencies that contributed to the RTE project. Key legislative changes at the EU-level included the revised eIDAS Regulation on electronic identification and trust services and European digital identity wallets (EU No 910/2014) and the Corporate Sustainability Reporting Directive (CSRD, EU 2022/2464) and their national implementation. The digital age directive proposal (ViDA), which was approved by Ecofin on 5 November 2024, significantly influenced the reporting target state and the schedule for changes leading to it.

The Interoperable Europe Regulation and the Cybersecurity Directive (NIS2 Directive, 2022/2555) were also taken into account in the project, and the potential effects of the Data Governance Act 2022/868, Data Act 2023/2854, Digital Markets Act 2022/1925, Digital Services Act 2022/2065 and the Artificial Intelligence Act 2024/16 were also investigated. The RTE project also monitored regulatory developments regarding the new Ecodesign for Sustainable Products Regulation and the Habitats Directive, and examined the relationship of digital business documents with digital product passports and traceability reporting.

With regard to international projects and organisations, the RTE project had links with the NSG&B programme, the EU Digital Identity Wallet Consortium (EWC), the SDG OOTS project on the Digital Gateway, the Estonian Real Time Economy programme, the European Standardisation Organisation CEN (European Committee for Standardization), the Semantic Interoperability Community SEMIC, and the OpenPeppol organisation (set up as an AISBL, L'association internationale sans but lucratif, under Belgian law).

With regard to national projects and forums, the work of the RTE project had notable links with the national implementation of the revised eIDAS Regulation (responsible party: VM), the Virtual Finland project (responsible party: UM), the eFTI project (responsible party: LVM), the programme to promote life event-based digitalisation (responsible party: VM), the e-invoicing forum (responsible party: Tiekery), XBRL Finland, and the Findynet cooperative for the development of a trusted network for verifiable data.

The internal target state projects of the organisations participating in the RTE project were the most significant dependencies in the content of the reporting target-state component of the work and in the scheduling of the planned changes. In addition, the support and policies of the participating organisations' internal strategies also influenced the work of the RTE project.

## **4 Benefits and changes for operators**

### **4.1 Benefits of real-time economy in general**

A functional real-time economy ecosystem makes it possible to develop automation and increase efficiency both in the business sector and in public sector agencies. In businesses, financial administration will become more efficient as the visibility of the company's finances is improved by real-time financial data and there is less need for manual processing and reporting.

Service providers such as software companies and financial management services will have new business opportunities as the quality and availability of information improves. Ecosystem actors can redirect time and money to focus on activities that generate more added value. Paper consumption in financial administration is reduced, which helps businesses to act in a more responsible and environmentally friendly manner. Internationally interoperable solutions improve the

competitiveness of businesses and the productivity of society as a whole.

Government agencies can provide smoother services for businesses and improve their own efficiency with the help of real-time information. High-quality structured information enables the automation of processes and allows monitoring to be targeted more efficiently than at present.

## 4.2 Benefits for businesses

Real-time economy offers businesses several significant benefits that can help them improve the efficiency and competitiveness of their operations. These include:

- Information on sales transactions can be directly transmitted to the company's and the client's records.
- Business can monitor their finances in real time and take necessary action, for example, in stock management, orders or logistics.
- Real-time purchase orders mean that information can be automatically reconciled with accounts payable records.
- Financial administration processes can be automated and reporting requirements can be easily met.
- Real-time information enables better predictability of business operations and more efficient risk management.
- Businesses can self-identify and share their information via their digital identity and corporate wallet.

Figure 2 describes the benefits for businesses identified above.



**Figure 2:** Benefits of real-time economy for businesses

Business documents in digital standardised format enable the use and processing of data also in the wider context of businesses' value chains and data economy. The EU is set to impose more requirements on corporate sustainability reporting, emissions data and product passports in the near future. The solutions presented by the project will also facilitate the fulfilment of future statutory obligations, as the same financial information base can be used to handle new reporting obligations.



### 4.3 **Cost-saving potential for society as a whole**

Investments in real-time economy will create significant benefits for both businesses and public sector agencies in Finland. According to reports commissioned by the RTE project, it is estimated that businesses and the public sector will benefit from savings totalling nearly EUR 6 billion thanks to reduced administrative work and costs. This requires companies and government organisations to comprehensively implement the standardised structured business documents.

In the real-time economy ecosystem, in the first phase the benefits to businesses are derived from the introduction of structured and standardised business documents. The project assessed their cost savings potential by 2030 as follows:

- The use of e-receipts can lead to annual cost savings of EUR 297 million if the 80% coverage target is achieved.
- The annual cost savings from e-invoicing will amount to approximately EUR 568 million, assuming 100% coverage in e-invoicing in accordance with the European standard.
- If 49% of catalogues, orders and order confirmations are processed and transmitted as electronic Peppol procurement messages, annual cost savings of EUR 2.7 billion can be achieved.
- If transport orders, bills of carriage and delivery notifications in the logistics sector are also digitalised, the annual cost savings could increase by approximately EUR 2 billion, in which case the total annual cost savings from the use of procurement messages would be approximately EUR 4.7 billion.

It is estimated that for government agencies using structured, standardised data (in the first phase, the Tax Administration and Statistics Finland) the data would bring a total benefit of EUR 183 million annually. For the Tax Administration, the annual benefit is estimated to amount to a total of EUR 181.6 million from the reduction of the tax gap, consisting of EUR 8.9 million in income tax gap and EUR 172.7 million in VAT gap. For Statistics Finland, the annual benefit is estimated to amount to EUR 1.4 million from the introduction of electronic business documents and XBRL GL and the widespread adoption of structured financial statements.

At this stage, the cost savings estimates do not include cumulative benefits from the reuse of data.

Figure 3 shows the potential benefit from the use of digital business documents by 2030.





**Figure 3:** Potential benefit from digital business documents by 2030 in EUR

## 5 Project outputs

### 5.1 Summary of project outputs

The essential foundation of the real-time economy ecosystem is digital business information (procurement messages, e-invoices and e-receipts). In line with the RRF objectives, the description of the business information ecosystem was divided into two maturity levels. The first phase described the minimum viable ecosystem in 2022 based on functional e-invoicing and an e-invoicing ecosystem built around it, which serves as the basis for the description of the wider real-time economy ecosystem. The output according to the RRF target and the related measure scheduled for completion by the end of 2022 (RRF measure FI-C[P2C2]-I[I1]-M[61]) is described in a separate report (Appendix 3). In connection with Finland's second payment request, a summary document and documents verifying the achievement of the 2022 target were submitted to the Commission.

The second phase described the functioning of e-receipts and procurement messages in the national operating environment and the solutions and rules that enable data transmission. The solutions developed in the project make it possible to facilitate the transmission of business documents in a structured, machine-readable format to increase the automation of business processes. In addition to the operating environment for electronic business documents, the second phase described development measures for digital financial statements and the associated register, and the target state for sharing and reporting financial information, which enables the transfer of financial information from companies to government agencies in accordance with the once-only principle. The output according to the RRF target and the related measure scheduled for completion by the end of 2024 (RRF measure FI-C[P2C2]-I[I1]-M[62]) is described in a separate report (Appendix 4). In connection with Finland's third payment request, a summary document and documents verifying the achievement of the 2024 target will be submitted to the Commission.

Through the outputs, the RTE project has contributed to the progress of real-time economy and the achievement of benefits in line with the objectives identified in the decision to set up the project, including the following examples:

- The utilisation rate of standardised structured business documents was

- significantly increased and indicators were developed for monitoring.
- The Finnish Peppol Authority was established (State Treasury) to enable the ongoing development of Peppol procurement messages after the conclusion of the project. The function is statutory as of 1 November 2024.
- Production capabilities were created in the order management system of central government for structured Peppol procurement messages.
- A state aid model to support the introduction of Peppol procurement messages (including e-invoices) was introduced. This will also strengthen opportunities for small businesses to digitalise their procurement.
- Conditions were created to facilitate work to reduce administrative burden in regulatory reporting. For example, solutions needed for the target state of regulatory reporting were investigated, the functionality of the solutions was validated through trials, solutions were proposed for the preparation of the implementation, and the necessary responsibilities and roles were agreed upon.
- The utilisation rate of digital financial statements increased, and a validator to improve data quality was introduced along with a converter that makes reporting easier.
- The customer needs of consent-based information sharing were investigated and solutions were proposed for the preparation of the implementation.
- Prerequisites were created for advancing the work on the digital identity wallet for enterprises and preparing the implementation.
- A joint management model and tools were created for the steering, coordination and cooperation of the real-time economy ecosystem. The official tasks required by the ecosystem's functionality and a cooperation model for the ecosystem parties were introduced, and clear responsibilities and roles were agreed for the parties.
- Preliminary assessments of necessary legislative changes were conducted:
  - changes related to agencies' competencies and tasks and the joint management model
  - changes related to business documents
  - legal assessment of competition law/state aid aspects in the state aid model intended for supporting the introduction of Peppol messages
  - changes related to information exchange and reporting
  - changes related to digital financial statements
  - changes related to digital identity for businesses
  - The Government proposal (HE 117/2024 vp) on changes to the PRH's tasks was prepared in cooperation with the Ministry of Economic Affairs and Employment. In the legislative amendment, a new task was proposed for the PRH in the steering and development of the digital financial administration network for businesses. The law also contains provisions on the cooperation group.
  - The amendment to the State Treasury Act on the Peppol authority (HE 79/2024) was prepared in cooperation with the Ministry of Finance.
- Reports related to information security and data protection were conducted according to substance areas on topics including business documents, a centralised solution for the exchange of information, digital business wallets and a joint management model for the ecosystem enabled through joint development.
- Instructions were drawn up on the implementation of the solutions included in the scope of the RTE project, trainings were organised and several communication and marketing measures were implemented.
- The RTE project acquired extensive customer insights, carried out several cost-benefit analyses, compiled a situational picture of businesses' digital

capabilities and identified the digitalisation capabilities needed for businesses to achieve the benefits. The RTE project verified the functionality of real-time economy solutions through a total of 42 trials which were carried out in cooperation with several private and public sector parties.

- The RTE project produced a roadmap for 2025–2030 on measures to achieve the intended benefits of real-time economy. It will serve as the basis for further work after the project.

The project objectives and corresponding outputs are described in Appendix 5. Output reports have been prepared for each project area with detailed descriptions of the area-specific objectives and outputs (Appendices 6–14).

Sections 5.2–5.5 provide a summary of the key outputs of each substance area.

## **5.2 Joint management model for the real-time economy ecosystem**

The aim of the RTE project was to describe the structures and relationships of the real-time economy ecosystem so as to enable efficient and goal-oriented development of the ecosystem. The aim of the RTE project was to design and implement solutions based on the needs of businesses. The RTE project developed procedures, instructions and tools for joint development, which can also be used after and beyond the project.

The work on the ecosystem also sought to create a joint management model for the development and steering of the ecosystem that ensures the achievement of the vision and long-term objectives and continued progress after the conclusion of the project. The joint management model refers to shared principles and tools developed for the management of the ecosystem. The model describes to the members of the ecosystem how the ecosystem functions, what kind of functional entities are included in the ecosystem, how their development is coordinated and promoted, and how organisations can operate and succeed in a complex real-time economy ecosystem.

In the joint management of the ecosystem, it is essential to examine the whole concept from different perspectives. The project identified 12 key perspectives that are needed in the development and steering of the ecosystem. The perspectives form the framework for the joint management model for the real-time economy ecosystem. The joint management model is described in Appendix 6.

The sub-areas of the ecosystem must be interoperable. The RTE project identified measures in each of the four levels of interoperability (semantic, organisational, legislative and technical) to ensure interoperability. The measures are described in Appendix 6. For example, in order to ensure semantic interoperability, the project produced glossaries and carried out conceptual data modelling. In this work, the project utilised the interoperability platform tool maintained by the Digital and Population Data Services Agency. A glossary of business document terms (Hankinnasta maksuun, “Purchase to Pay”) was added to the platform, and data models used in international e-invoicing formats were translated into Finnish. The semantic glossary contains 309 terms covering 15 different conceptual areas. The glossary covers almost the entire supply chain at present.

The RTE project also produced guidelines and playbooks that can also be used more broadly in ecosystem development. These include playbooks on trials and architecture, which are described in Appendix 6.

The project produced a steering model for the real-time economy ecosystem, which describes the roles and responsibilities of the ecosystem members and a strategic, tactical and operational cooperation model. The steering model also describes the

shared working principles, co-creation procedures and rules of the parties participating in the steering and development of the ecosystem. The steering model is described in Appendix 6.

A situational picture and indicators that describe the development of digitalisation in the field are needed to support the planning of the steering and development of the ecosystem. The data-based business segmentation produced by the project describes the digital capabilities relevant to digital financial administration in Finnish businesses and their development. The project also defined the minimum capabilities businesses need in order to operate in the real-time economy ecosystem and to fully benefit from it.

The project identified different stages that represent the steps of the development of real-time economy. The benefits brought by each development stage can be analysed in relation to the preceding stages, and the enterprise architecture required in each development stage can be described. The project identified critical paths that enable businesses of all sizes to participate in the developing real-time economy ecosystem and leverage the benefits of digitalisation. The transition from one stage of development to the next is not the same for all businesses; rather, it depends on material differences in their operations. Some of the developments under review have been under development for a long time, and new issues and phenomena affecting the development of real-time economy are constantly emerging.

A tool enabling joint discussion was needed to describe different parties' dynamics, interdependencies and changes in the operating environment, which also contributed towards a shared understanding. The project produced a system dynamic model that illustrates the real-time economy ecosystem. The model describes the ecosystem for the exchange and use of financial data especially in areas where the data are created or processed in interaction between the parties. Regulatory reporting and data generated in purchase and sales transactions were key concepts to be described.

Based on the systemic model, the project identified the minimum viable ecosystem (MVE) i.e. the baseline for the build and expansion of the financial data ecosystem. The project restricted the scope of the MVE for real-time economy to structured business documents, structured digital accounting and the capabilities of businesses to share financial data with each other and with public agencies. The MVE includes the production of financial data in a structured format, the capabilities of public agencies to process reported data according to the once-only principle, and the possibility to scale the re-use of data by supporting the returning of data to businesses for further use.

The project identified a number of measures to advance the real-time economy objectives. Necessary measures create the conditions for digitalisation in businesses and for the growth of the real-time economy ecosystem. An interoperable ecosystem cannot function unless the measures are implemented. After the necessary measures, the system is steered towards the desired change.

Three ecosystem trials were carried out to validate the building blocks needed to build the ecosystem and to verify the ecosystem benefits achieved through a seamless flow of information. The trials also helped to illustrate the systemic nature of the economy and the flow of information. The trials are described in Appendix 6.

For the management of the RTE ecosystem as a whole and the implementation of changes, the project produced a roadmap for 2025–2030 for the measures aimed at realising the benefits of real-time economy, which can be used as a basis for further work after the conclusion of the project. In particular, the roadmap describes the implementation plan for the measures identified as critical in the target-setting and the building blocks of the minimum viable ecosystem. The roadmap is described in Appendix 6.

### 5.3 Purchase to pay

The Purchase to Pay component produced the targets and outputs related to digital business documents. The scope included structured procurement messages, e-invoices and e-receipts. The project created the foundations for the extensive introduction of digital standardised business documents.

The Procurement Messages sub-component focused on the digitalisation of the order phase of procurement processes. Following the RTE project's investigation and proposal, Finland's Peppol authority function was established within the State Treasury to ensure the efficient use of the Peppol infrastructure and messages during the RTE project. The Peppol authority is the national body responsible for promoting the use of the Peppol network and for monitoring and supporting national service providers in matters relating to the network. The Peppol authority can also contribute to the development of the international Peppol network. The authority helps to ensure that the development and use of the Peppol infrastructure progresses as intended, taking national interests into account. A national Peppol authority and its tasks are prerequisites for promoting broader adoption of Peppol messages and participation in their development.

One of the principles of the RTE project was that the public sector should lead by example in driving forward the digitalisation of financial administration. In cooperation with Palkeet, the project implemented Peppol's extended order process in Handi, the central government's centralised system for processing orders and purchase invoices. To expand the use of Peppol procurement messages, the Peppol ACL address directory and its integration with the verkkolaskuosoite.fi e-invoicing service were also implemented.

The RTE project also aimed to ensure the availability of services for small enterprises. To support the introduction of Peppol procurement messages (including e-invoices), the RTE project prepared a state aid model aimed at supporting the supply and market of Peppol services and increasing the utilisation rate of Peppol. In accordance with the model, the State Treasury can grant state aid to reduce deployment costs to application service providers whose application meets the specifications. The support will be available until the end of 2026, and its direct aim is to assist deployment in 5,000 new enterprises.

The project's target was to increase the rate of e-invoicing among businesses and organisations to 90% by the end of 2023. The RTE project developed e-invoicing indicators to monitor the utilisation rate. The volume target for e-invoices was achieved in 2022. Based on the e-invoicing indicators, the RTE project produced an e-invoicing analysis that can be used to target activation measures by sector in order to expand the use of e-invoicing. Although the e-invoicing rate is high, it is important to encourage organisations to use validated e-invoices in accordance with the European standard (EN16931) in particular to ensure the quality and usability of the data. The State Treasury will continue to produce the e-invoicing indicators after the conclusion of the project in order to illustrate market potential and the progress of digitalisation. The indicators can also be used to monitor the transmission volumes from the national network to the Peppol network.

According to the project target, 20% of all receipts transmitted nationally between organisations should be structured receipts by the end of 2023. A reporting model and guidelines were produced to monitor the achievement of the target. According to the report, the total number of B2B receipts in Finland in 2023 was 118 million, of which 18% were transmitted in a structured format. However, responses for early 2024 indicate that the share of structured receipts has increased significantly in

2024. In central government, the share of e-receipts increased from 0.67% to 27.5% during the project.

The RTE project prepared a rulebook for e-receipts in cooperation with stakeholders. The work had broad-based representation of stakeholders, including the Finnish Commerce Federation, retail chains, software houses, e-receipt operators, banks and e-invoicing operators. As a follow-up to the rulebook, the RTE project collaborated with cash register system suppliers and e-receipt operators to define a QR code which can be used to transmit the e-receipt to the buyer's chosen system via the e-address.

The RTE project aimed to have, to the extent possible, the data content objectives of the Finnish e-receipt incorporated into the e-receipt standard of the European Committee of Standardization (CEN). The Member States did not reach a consensus on the e-receipt standard in CEN, but it was decided to implement a common technical description of the e-receipt. All of Finland's requests were included in the description.

To support the introduction of digital business documents, the RTE project published guidelines, organised trainings and carried out communication and marketing campaigns. In addition, the State Treasury published support websites for Peppol and e-receipts, which will continue to be maintained after the project. The RTE project carried out several successful trials on the use of digital business documents and the transmission and use of data in cooperation with private and public sector actors, and collected customer insights through interviews and studies. The project examined the benefits and costs of using digital business documents. According to the reports, from the point of view of benefits realisation, broad-based adoption of digital business documents is essential, and the associated costs are relatively low. In order to achieve the objectives related to business documents, the RTE project also identified essential legislative amendments and produced a preliminary analysis on this topic. In addition, the RTE project set up cooperation groups with stakeholders to expand and develop the use of procurement messages and e-receipts.

As a basis for further work, the RTE project produced more detailed roadmaps for 2025–2030 setting out measures that support the achievement of the objectives related to digital business documents. The ecosystem management model for digital business documents produced by the project ensures the implementation of the roadmap and further development of business documents.

The objectives and outputs concerning business documents are described in Appendices 7–9.

## **5.4 Dissemination and reporting of information**

### **5.4.1 Target state for the dissemination and reporting of information**

The aim of the project was to produce solutions for the target state of financial data dissemination and reporting, in which financial data are automatically transmitted to different users in accordance with the once-only principle. In the project, the scope of the target state for financial data dissemination and reporting was restricted to the Finnish Tax Administration, Statistics Finland and the Finnish Patent and Registration Office (PRH). These agencies represent a significant share of businesses' financial reporting obligations and thus of their administrative burden. The solutions developed in the project and those adopted in the future will be scalable to enable the inclusion of other users and sources of data.

The target state solutions developed in the project are taxonomy-based reporting and centralised exchange of information, which, in the project's view, should be introduced in regulatory reporting. The solutions enable the automated transmission of standardised and structured financial information to data users. Through digitalisation, regulatory reporting can be significantly streamlined, which reduces the administrative burden and improves efficiency in public administration.

The reporting taxonomy is a structured data model that compiles the information required by public agencies from different data sources. Reporting based on a common data model reduces the administrative burden in financial data submissions, as data can be transmitted from one source to several recipients at once. This is done through the semantic and technical standardisation of data, which means that data can be structured and data processing can be automated.

A common structure and a shared semantic understanding of the datasets promote the integration of reporting into the business processes of enterprises, when information generated in different stages of the processes – and its usability by different parties – can be identified. With taxonomy-based reporting, data producers have a clear view of the requirements for different data sources in terms of both standardisation and data structure. The RTE project has supported the taxonomy reporting processes by preparing glossaries, data flow descriptions and data models to promote semantic and technical interoperability.

In the first phase, taxonomy reporting is proposed for tax and statistical reporting. Taxonomy-based reporting would initially be based on structured e-invoices in accordance with the European standard. During the project, it was identified that the same structured information base could also be used for other purposes such as sustainability reporting, product passports and funding processes.

The centralised information exchange solution enables businesses to fulfil their reporting obligations and the relevant public agencies to access the information in line with the once-only principle.

In the target state of data reporting and dissemination, capability requirements for businesses, software and public agencies were identified. The identified capability requirements are:

- ability to produce standard XBRL GL accounting data for reporting
- ability to produce and receive e-invoicing data in accordance with the European standard
- ability to produce and receive e-receipts
- ability to produce financial statements in iXBRL format.
- ability to present accounting data in accordance with the standardised reference chart of accounts
- ability to use monitoring items of data dissemination in reporting
- ability to send data in standardised format to the interface
- ability to respond to reporting schedule requirements.

The project investigated what kind of target groups the target-state solutions would apply to. Based on the findings, it is proposed that the target groups be restricted according to the type and size of company in the first deployment phase. It would be appropriate to exclude the smallest Finnish companies in addition to the introduction of mandatory capability requirements. Therefore the introduction would exclude limited liability companies, cooperatives, limited partnerships and general partnerships with modest activity levels, i.e. whose annual turnover is less than EUR 20,000. The scope corresponds to the VAT liability limit.

Different co-creation methods were extensively utilised in the development of solutions for the reporting target state. The project completed six trials that tested the usability of information at different levels in regulatory reporting, the quality of information, the resources required from businesses, accounting firms and software vendors to produce the information, the requirements for public agencies to receive and process the information, data conversion, and standard interface specifications. In connection with the trials, several workshops and customer insight studies were organised to gain in-depth understanding of the benefits and costs that the solutions would generate for businesses, accounting firms and software vendors. Cost-benefit analyses were produced based on the findings. Among other things, the findings from the trials indicate that it is possible to submit accounting data for regulatory reporting in the XBRL GL format to support decision-making at reasonable costs. The project also conducted an international comparison of possible solutions for the dissemination and reporting of financial information. In addition, the need for legislative changes was investigated.

The target state requires structured and standardised financial information – invoices, receipts, accounting data and financial statements. Electronic invoicing in accordance with the EN standard is a prerequisite for efficient use of the data. The target state also requires XBRL GI-compliant reporting of accounting data and the standardisation of datasets based on the reference chart of accounts and monitoring items. The use of the XBRL GL standard for accounting datasets was adopted in principle in the project.

The RTE project developed a management model for the further development and maintenance of the target state of dissemination and reporting, which describes parties' responsibilities, roles and tasks. The management model is described in Appendix 10.

The objectives and outputs of dissemination and reporting are described in more detail in Appendix 10.

#### **5.4.2 Digital financial statements / The annual accounts register project**

The objective of the Annual Accounts Register project, which was implemented as part of the RTE project, was to create preconditions for wide adoption of digital iXBRL accounts. The aim of the project was to make changes to the Finnish Patent and Registration Office's (PRH) systems for receiving digital accounts and their submission to the Trade Register maintained by the PRH. The aim was to increase the voluntary submission of digital accounts through communication and stakeholder campaigns and to advance the preparation and adoption of legislative amendments.

Digital accounts are in a structured machine-readable format. The iXBRL has been chosen as the standard for financial reporting in Finland. The majority of accounts are currently submitted to the Finnish Patent and Registration Office's Trade Register via the Tax Administration as PDF files. Submission in structured format requires that the company has access to financial management software that supports the creation and transmission of iXBRL-format accounts.

The RTE project carried out a change analysis which describes the benefits and costs to stakeholders from the broad-based adoption of digital accounts and the provision of structured accounting datasets as open source data. Structured accounting data improves operational efficiency and the quality and usability of information. It also brings new opportunities in areas such as funding applications, statistics, taxation, the tackling of shadow economy activity, auditing, research, business partner checks and various types of business analyses. One important



benefit for society as a whole is transparency of information. Open access to information increases trust between different actors when the information is commensurable and comparable. Businesses and their personnel also benefit from improved data protection.

In order to generate digital accounts efficiently, software products need to include the functionality for digital submission. The one-time cost of the implementation for software vendors is moderate. According to information obtained by the project, the cost per software product is estimated to be approximately EUR 8,000 (a total cost of approx. EUR 320,000 for all software vendors).

The PRH acquired a validator that checks iXBRL compatibility before the registration of accounts data. The validator will be integrated with the iXBRL interface during the RTE project. Later, the validator will also be introduced to the BIS service to enable digital accounts submissions.

To facilitate the generation of digital accounts, the PRH acquired a browser-based converter, which will be introduced during the RTE project. The converter allows companies to convert their accounts to the iXBRL format free of charge and then submit them to the PRH's Trade Register.

The Accounts project introduced a taxonomy for foundations and a new version of the taxonomy for limited liability companies. The existing taxonomy was translated into Swedish and English to enable accounts to be produced in these languages. The language versions also enable users to view accounts in a different language than the original reporting language. The translated taxonomies will be introduced by the end of 2024. By the end of 2024, the ESEF taxonomy used by listed companies will also be added to the interface. A need for a cooperation group for the development of accounting taxonomies was identified, and the intention is to set it up during the first half of 2025.

In January 2024, an act entered into force that requires large companies to submit their accounts to the Trade Register in digital format (HE 20/2023, amendment 1249/2023 to Accounting Act 1336/1997). The requirement was targeted at companies that are subject to the Corporate Sustainability Reporting Directive. The requirement applies to approximately 1,200 large companies. The project produced and approved a target state for financial statement reporting, in which the aim is that all companies will submit their accounts in a structured digital format in the future.

The outputs and recommendations of the Accounts project are described in Appendix 11.

### **5.4.3 Target state of consent-based information sharing**

Businesses need different types of information about their partners via third parties, for the purposes of both collaboration and regulatory compliance. Such information is needed, for example, in various types of business transactions, when assessing the financial standing of another company, and in order to meet requirements on customer due diligence checks. Some of the information needed by companies is confidential on the basis of law or special agreement, in which case the company seeking the information cannot request it directly from the source. In this case, the subject company has to provide the information directly to its partner.

The RTE project investigated possible solutions for enabling the sharing of confidential business information through an electronic interface and the needs of the users of such a solution. The RTE project limited the investigation to situations where the consent-giver is an enterprise, i.e. where the enterprise authorises its contractual or cooperation partner to search for and receive information about it.

Based on customer insights, the RTE project identified use cases and produced a benefit potential assessment in three use cases. The benefit assessment calculated the savings that would be generated if confidential information were available digitally and in a structured format based on the company's consent. The benefit potential was estimated at approximately EUR 7.5 million per year. Assuming that each of the 24 identified use cases produces the average benefit of the three use cases, the total annual benefit would be approximately EUR 60.8 million. However, most of the use cases are larger in volume than the use cases used in the calculation. The RTE project also carried out an international comparison of consent-based information sharing solutions implemented in Norway, Sweden, Denmark, Portugal and Estonia.

In the customer insights study, the RTE project identified the financial industry as one sector where there is a clear need for consent-based information sharing. The project acquired more in-depth customer insights from the financial sector by conducting a trial in cooperation with the Tax Administration and a trial partner from the financial sector, in which the Tax Administration shared tax information under authorisation. Based on the trial, the project defined an operating model for consent-based information sharing between the financial sector and the Tax Administration. The trialled method could also be used to share business-related information managed by other authorities.

The target state of consent-based information sharing and recommendations on further work are described in Appendix 12.

## **5.5 EU digital wallets – opportunities for businesses and public agencies**

The Born Digital component of the RTE project focused on the possibilities of corporate digital wallets. Digital wallets are an important future tool for the exchange of information. They are applications that businesses can use for identification, electronic stamping and managing and sharing their digital certificates. Wallet-based identification uses unique corporate identifiers (so-called LPID).

In particular, the introduction of wallets and their integration into international markets will be supported by the revised eIDAS regulation on electronic identification and trust services (the so-called eIDAS2 regulation), which entered into force in May 2024. An eIDAS2-compliant wallet (the so-called EUDI wallet) enables reliable electronic identification and transactions in the whole EU area for both natural and legal persons.

The eIDAS2 Regulation requires high level security checks in the issuance of credentials. The competent authorities of the Member States can provide a high level of trust in the identification and issuance of the LPID. This ensures that a legal person who presents as or claims to be a specific person actually is the legal person in question. Business identification data approved by the Member States can be provided by trade registers or equivalent official sources. The issuance of LPIDs delivered by the eIDAS2 implementation project will also enable the development of wallet services for corporate entities.

The eIDAS2 Regulation does not comment on the method of the EUDI wallet's implementation. However, the preparation of the EU architecture framework was based on the assumption that the wallet is an application that works on a mobile device. In Finland, the Digital and Population Data Services Agency (DVV) produces a mobile wallet for Finnish citizens and residents as part of a national implementation of the revised eIDAS2 Regulation.

In the project's view, a corporate identity wallet operating on a mobile device could be a viable solution for micro-enterprises in which the owner is the primary entity and decision-maker behind the enterprise. A corporate wallet could work on an entrepreneur's mobile device alongside or as part of their personal wallet. The project outlined the use of a mobile wallet as a corporate wallet based on a prototype interface. The proliferation of mobile corporate wallets is supported by the certifications required of the EUDI wallet, which are expected to be available first for wallets running on a mobile device.

The needs of businesses vary depending on the size and sector of the company, and it is likely that wallet service providers will develop different types of wallet solutions to meet individual needs. A server-based wallet is likely to be a more appropriate alternative for larger companies.

Digital wallets can be used to share verified data, so-called attribute certificates, which can ascertain the origin, integrity and validity of the data. Possible attribute certificates issued by the authorities could include trade register extracts, statements of outstanding taxes and domicile certificates for tax purposes. Possible attribute certificates issued by companies include bank account information, letters of credit, e-receipts and product passports. In order for all parties to have a common understanding of the contents of attribute certificates, the certificates must be based on commonly accepted data models.

The RTE project identified opportunities offered by corporate digital wallets. The project examined the life cycle of a company to identify situations where the EUDI corporate wallet could be used. The corporate wallet can be used at different stages of a company's life cycle. The RTE project divided the lifecycle into four typical stages, which correspond to the life cycle phases identified in the Nordic NSG&B programme:

1. conception
2. start-up
3. operation
4. cessation.

The RTE project carried out several customer insight studies and trials on the use of the corporate wallet. The corporate wallet could be used, for example, in funding applications, the identification of potential partners (KYC attribute certificates) and in the order-delivery process (e-receipts and product passports).

The RTE project participated in the Ministry of Finance's foresight work on digital identity wallets, produced a legislative report for the Ministry on the LPID launch and participated in an operational study on LPID.

Due to the ongoing transitional phase of the wallet's development, the RTE project engaged in extensive cooperation both nationally and internationally with other parties involved in and contributing to the development work. The aim was to influence the development of the digital identity wallet at the European and national levels, increase shared understanding and promote opportunities for Finnish businesses and public agencies to utilise EUDI wallets and gain added value from them.

In the future, wallets will significantly improve the efficiency of businesses' operations and streamline transactions. The corporate digital identity and wallets make it possible to check partners' reliability and to electronically share documents quickly and securely, which also promotes international partnerships. Wallets

enable new services for businesses that speed up business processes and reduce costs. They also offer a springboard for new business opportunities and innovations.

For public agencies, the most important benefits of wallets are related to information security, strong identification and the distribution of attribute certificates in a structured format, which speeds up process automation. The project implemented threat modelling and security risk assessments for the wallet.

The wallet ecosystem referred to in the eIDAS2 Regulation will be in existence in Finland by 2026 in accordance with the timetables of the eIDAS2 implementation project. Although the development of the wallet has started with natural persons, businesses will also be able to join the ecosystem after the implementation of the LPID's issuance to wallets.

The objectives and outputs of the Born Digital component are described in Appendix 13.

## **6 Project steering, resources, working methods and reporting**

### **6.1 Project steering**

The RTE project operated under of the Ministry of Economic Affairs and Employment. The project involved extensive cross-administrative cooperation with agencies, ministries and private sector parties. The Finnish Patent and Registration Office (PRH), the State Treasury (VK), the Tax Administration (VH), the Digital and Population Data Services Agency (DVV) and Statistics Finland (RD) were key actors in the project. The project was led by the PRH.

In conjunction with the decision to set up the project (Ministry of Employment and the Economy decision 14 June 2021), a strategic management group was appointed with representatives from the following organisations:

- Ministry of Economic Affairs and Employment
- Ministry of Finance
- Ministry of Transport and Communications
- PRH
- State Treasury
- Finnish Tax Administration
- Statistics Finland
- DVV
- Confederation of Finnish Industries
- Technology Industries of Finland
- Federation of Finnish Enterprises
- Financial Administration Association (Taloushallintoliitto)
- Finnish Commerce Federation
- Finance Finland
- Association of Finnish Cities and Municipalities

The task of the management group was to steer, support and monitor the implementation of the project in accordance with its objectives and to review significant changes affecting the costs, objectives and schedule of the project. The management group served as a place for open discussion between private and public sector actors on the strategic direction of the project in accordance with the

open government principle. The management group did not have any decision-making powers in matters that were within the competence of individual authorities. The management group was chaired by the State Secretary of the Minister of Labour. A secretariat consisting of representatives of the project organisation and the Ministry of Economic Affairs and Employment supported the management group and prepared its meetings. The project director presented matters to the management group. The management group had four meetings per year.

On 27 October 2021, the Ministry of Economic Affairs and Employment appointed a steering group consisting of representatives of the Ministry of Economic Affairs and Employment, the Ministry of Finance and the agencies involved in the project to support the practical implementation of the project. The term of the steering group ran from 1 November 2021 until 31 December 2024. The steering group was chaired by a senior ministerial adviser from the Ministry of Economic Affairs and Employment. The steering group was the executive body in charge of the project. According to the appointment decision, it was specifically responsible for:

- promoting and monitoring the achievement of the objectives and benefit indicators set for the project.
- steering the project's communications, budget, dependencies, risk management and benefit outcomes.
- steering the national implementation of the Nordic Smart Government and Business programme.
- monitoring schedule adherence.
- reviewing the measures coming through risk and change management and their impacts on the objectives, content, costs and person-workloads of the project.

The steering group did not have any decision-making powers in matters that were within the competence of individual authorities. The steering group met regularly once a month. The steering group met at least four times a year with additional attendees including the directors of the relevant public agencies in addition to the regular members.

The project also had an operational steering group, which was responsible for the teams' operations and steering. The operational steering group's tasks included monitoring the progress of the project, reviewing the proposed solutions, and reviewing change requests and decision proposals before their review by the steering group. The operational steering group made decisions on change requests related to resourcing, tasks and schedule. Significant change requests were also discussed in the project steering group. The operational steering group was chaired by the project director, its secretary was the project assistant, and the members were team leaders and agencies' project managers. The operational steering group met regularly every two weeks.

The practical work of the project took place in teams, each having a named team leader and experts. All team leaders except the procurement team were appointed from the agencies. Team leaders were responsible for the content-related guidance of their team's work. In addition to the working meetings, the teams had regular weekly meetings on the progress of the tasks and current issues. The following teams operate in the project:

- Dissemination and reporting of information
- Purchase to pay
- Born digital
- Ecosystem development
- Legal team

- Communications team
- Security and risk management team
- Procurement team (active only during the procurement phase, led by Hansel's project manager).

Weekly team meetings were led by the project director and attended by the members of the operational steering group and the person responsible for the project's stakeholder and advocacy work. Status updates and current issues were discussed in the weekly meetings.

In addition, the core team of ecosystem development met weekly to discuss key dependencies and the situational picture. These meetings were led by the ecosystem team leader and attended by team leaders, the project director and key experts from the ecosystem team. The core team's work was a key factor in understanding the overall picture and the interdependencies and impacts between different project components.

From the beginning, the project had a named project manager in each of the agencies that had access to the project budget (PRH, State Treasury, Finnish Tax Administration). The project managers, project director and project assistant formed the project office which coordinated the general management of the project under the direction of the project director. An additional agency-specific project manager for Statistics Finland was appointed at a later stage.

The project evaluation team consisted of private sector representatives from key industries related to the project objectives. The evaluation team met twice during the project. The purpose of the evaluation team was to act as an advisor to the RTE project by contributing the views of the relevant businesses, interest groups and research organisations on the project topics and help produce solutions that take into account the objectives and longer-term benefits of the project objectives for society.

## **6.2 Project costs and human resources**

The project was a part of the Finnish Sustainable Growth Programme, and it was funded by the EU Recovery and Resilience Facility (RRF). A total budget of EUR 14 million was allocated to the project for 2021–2024, and the costs of the project were paid from item 32.01.10 (Development of digitalisation) of the Ministry of Economic Affairs and Employment. This was a three-year deferrable appropriation.

The PRH, the State Treasury and the Tax Administration had entry access to budget item 32.01.10 of the Ministry of Economic Affairs and Employment. In accordance with the budgetary account breakdown, the Ministry of Economic Affairs and Employment annually confirmed the agency-specific budgets, which included entry rights for project codes specific to areas of responsibility.

Almost all of the persons working in the project were attached to the participating agencies so that they were allocated a certain amount of work in the project. In addition to the project work, the majority of the persons working in the project also had other work or project tasks in their agency, which occasionally made the coordination of project work challenging. In the early stages of the project (2021–2022), there was also a lot of turnover in the project personnel. The PRH's RTE project unit only included the project director, the project assistant and the communications expert.

The salary costs of human resources from the PRH and the State Treasury were primarily covered from the project budget. The salary costs of the Tax Administration's personnel who participated in the project were covered from the Tax Administration's budget. The Digital and Population Data Services Agency and

Statistics Finland provided experts for the project under their own budgets.

The PRH had planned a total allocation of approximately 17 person-years to the RTE project, and the State Treasury had allocated approximately 23 person-years. The Tax Administration had planned an annual allocation of approximately 21 person-years, covered from its own budget. The actual expenditure in person-years for the whole life of the project was 122.9 at the end of October 2024. The actual workload of the State Treasury was 36 person-years, of which 32 person-years were allocated to the budget of the RTE project and 4 person-years were allocated to the State Treasury's own operating expenditure; the total workload of the PRH was 22.2 person-years, of which 16.3 person-years was allocated to the budget of the RTE project and 5 person-years was allocated to PRH's own expenditure, and the Tax Administration's actual contribution was 56.7 person-years. The State Treasury's contribution was considerably larger than originally estimated, the PRH's contribution was close to the estimate, and the Tax Administration's contribution was slightly smaller than estimated, although it was still the largest. In tasks requiring in-depth expertise, the State Treasury found it more cost-effective to hire personnel for the project instead of buying in external services. Statistics Finland's contribution was approximately 8 person-years. The Digital and Population Data Services Agency's contribution was not tracked centrally, but it was estimated to be approximately 1 person-year in total.

The project's total budget outcome at the end of October 2024 was EUR 12,119,225.00 of which external costs were approximately EUR 8.6 million.

In addition to the persons appointed from the agencies, consultants played a key role in the project. The number of consultants varied; on average there were 20–25 consultants working on the project. Competitive tendering for the project was carried out centrally through Hansel's dynamic purchasing system (DPS) between Q4/2021 and Q2/2022 in the following categories:

- IT consulting (architecture, service design, IT design and specification experts and technical project managers)
- management consulting
- expert services in information management and digital security
- communication and marketing services
- terminology services.

A second tendering process for IT consulting was carried out through Hansel's DPS between Q4/2023 and Q1/2024.

In addition, a separate tendering process for XBRL and taxonomy expert services was carried out through Hansel, and trial and co-creation services were contracted from the state-owned Motiva Oy. In addition to these contracts, some direct procurements were made within the limits of the Act on Public Procurement and Concession Contracts.

Through co-creation, the project also involved a wide range of personnel from the private sector and public agencies, for example in trials, customer interviews, cooperation groups and workshops. The trial partners were compensated for the costs of participating in the trial.

### **6.3 Working method and tools**

The agile approach was applied in the project. The agile progress took place through trials and co-creation, and their results helped to clarify the tasks. The tasks were planned, broken down and carried out in four-week sprints. At the beginning of each sprint, the tasks to be advanced during the sprint were planned and assigned to team personnel. At the end of each sprint, each team reviewed

their outputs and current situation. Significant outputs were also presented in joint project reviews organised at the end of the sprints. The reviews also served as a quality control tool and communication channel for the project.

In addition to the sprint model, the project applied a phase model, which meant that the project outputs, the objectives of the next phase and the overall progress were reviewed and the progress plans for the next period were revised by the members of the operational steering group four times a year.

From the beginning, the RTE project had its own Teams workspace for the project personnel. Tiimeri workspaces were used for materials that required separate authorisation. For example, these included the materials and procurement documentation of the project office. The agendas, meeting materials and memoranda of the steering group and management group were also stored in Tiimeri.

Teams Planner and standard Office tools were initially used as project management tools. To make the work more efficient and streamlined, the JIRA project management tool and its add-on OKR Board (Objectives and Key Results) were introduced in January 2023.

The Miro collaboration tool was also used in the project. Customer insight surveys were done using Enterprise Filter Pro by Asiakastiето Oy. Shared communication tools were used: the LianaMailer newsletter tool, the Meltwater press release service and the Retriever RelationDesk social media management tool.

In the co-creation component of the RTE project, the key tool was the MiniSuomi trial platform (<https://minisuomi.fi/>). MiniSuomi is an open joint development platform, established to enable agile and flexible trials in public administration development projects. The trials carried out in MiniSuomi aimed to model solutions as concretely and as early as possible. The platform can also be used to test applications that automate and simplify data transmissions simultaneously with several public agencies. Technical trials and applications implemented in MiniSuomi are freely available to everyone. Where possible, the sample applications built on the MiniSuomi trial platform also utilise other data definitions intended for public use, such as the data interoperability platform maintained by the Digital and Population Data Services Agency. Most of the applications currently in MiniSuomi were developed in the RTE project.

## **6.4 Reporting procedures**

The progress of the project was continuously monitored through progress reports in the meetings of the project's operational steering group, steering group and management group. The team leaders produced monthly progress reports which were discussed in the project's operational steering group and, in a summarised form, in the project steering group and management group. Changes to objectives, task contents or scheduling were discussed in the operational steering group in accordance with the project's change management procedure. Any changes with significant impacts on the scope of the project, the budget or customers' operations were also referred to the project steering group in accordance with the change management procedure. The JIRA project management tool was also used to monitor the objectives and related tasks.

The project's financial situation was reported to the steering group once a month. The financial report cumulatively monitored annual costs and the budget forecast and cumulative costs over the project's life. Person-year and external expenditure were monitored separately. The project director was responsible for financial reporting on the basis of reports received from Palkeet and for forecasts on the basis of information received from the agencies' project managers.



The progress of the project was monitored regularly in the Ministry of Finance's project portfolio in accordance with its procedures. Reports were submitted to the Ministry of Finance's project portfolio four times a year. The progress of the RRF targets and other reportable items related to RRF procedures were monitored in accordance with the RRF reporting procedures. In Finland, the Ministry of Finance and the State Treasury provide guidelines on reporting procedures related to RRF. RRF requirements involve continuous reporting, annual clock reporting, and reporting done in connection with payment requests. The project director was responsible for reporting to the Ministry of Finance's project portfolio and RRF.

## **7 Risk management**

### **7.1 Project risk management procedures**

The objective of risk management in the RTE project was to identify risks related to project work that, if realised, could obstruct the work or prevent the project's objectives from being achieved. Another objective of risk management was to plan and implement management measures to reduce the likelihood or impact of the identified risks.

The implementation of risk management was the responsibility of the project's security and risk management team ("TurvaRi"). TurvaRi prepared procedures that included risk identification, valuation, implementation of risk management measures and monitoring activities.

From spring 2022, risks were identified through free reporting, various risk surveys and risk workshops facilitated by TurvaRi. In this way, project participants were actively involved in reporting potential risks, and key experts' knowledge could be used in risk workshops in a targeted and efficient manner where necessary.

The identified risks were added to the project's risk list and evaluated on the basis of impact and probability using a five-tier risk classification. The root causes, impacts and consequences of the risks were described in cooperation between TurvaRi and subject-specific experts. Responsible parties were appointed to plan and implement measures to prevent and mitigate the identified risks. In this way, each risk was prioritised, documented and assigned ownership so as to facilitate their active monitoring and management measures.

TurvaRi actively monitored the implementation of management measures so that any delays could be detected in time and any obstacles and changes could be escalated if necessary. The status of the risks was updated in the risk list over the course of the risk management measures.

Active and centralised risk management enabled the project management to have an up-to-date view of potential risks to the project's objectives. In addition, risk management enabled evaluation to determine appropriate responses to risks and the allocation of project resources to the most essential risk management measures. Examples of concrete benefits of the implemented management measures include measures to actively involve stakeholders, comprehensive contract practices developed for trials, improved risk awareness among project staff, and securing post-project work by ensuring funding.

### **7.2 Key risks identified in the project**

Over the course of the project, nearly 300 risks were identified and described in the project risk list. The key risks identified for the achievement of the project's objectives were:

- Disruption to further work on real-time economy due to lack of funding.
- Inability to define or put in place critical policies or operating models for the development of the RTE ecosystem.
- Inability to advance the necessary legislative changes; as a result, businesses do not invest in the required changes and the Vision 2030 objectives or benefits cannot materialise.
- Failure in communicating or disseminating the project's final outputs, leading to duplication in developed solutions.
- Individual significant stakeholders or parties slow down or prevent progress towards the goals, leading to hesitation or inability to make decisions.

The key risk management measures were also assigned ownership, planned and implemented, and their implementation was actively monitored as part of the project's risk management.

### **7.3 Transfer of key risk management measures to post-project work**

Some 300 risks were identified during the RTE project, some of which also concern further development after the project. The risks were categorised based on whether they could affect work during the project and its promotion after the project, or just further work post-project. The risks could have a negative impact on the achievement of the ecosystem objectives. It is important that the risk management started in the RTE project will also be implemented in the further development of RTE.

TurvaRi prepared a plan related to the transfer of responsibility, according to which the above-mentioned risks and good risk management practices identified in the RTE project can be transferred into risk management activities in further development. For these risks, a separate risk catalogue was compiled, describing the preliminary management measures for the risks and the suggested responsible parties.

## **8 Cooperation and communication channels**

### **8.1 General principles of the project**

The key starting point of the RTE project was to develop solutions in cooperation between private and public sector parties so that the policies and solutions are based on practical consideration of businesses' needs in all stages of the project.

In the early stages of the project, common principles for the work were defined:

- Customer orientation
  - We brainstorm and develop solutions together with customer needs as a starting point.
- Openness
  - Everyone willing can participate in the cooperation.
  - Dates and materials of events are available on time.
  - The project has a website [www.yrityksendigitalous.fi](http://www.yrityksendigitalous.fi).
- Trust
  - Everyone shares their competence.
  - We take advantage of others' competence together.
  - We take information security and data protection requirements into account in everything we do.
- Utilisation of existing resources, taking new opportunities into account
  - We use global standards and existing solutions as far as possible.

- We strive to identify dependencies and the capabilities of different actors.
- Our development takes into account the opportunities provided by new technologies etc.
- We strive to achieve results quickly through trials.
- We apply the FAIR Data information management principles (Findable, Accessible, Interoperable and Reusable).
  - The FAIR Data principles are mentioned in the European Commission's communication on European Data Strategy (2020) as a means of achieving European interoperability. The same principles are also followed, for example, in the Nordic Smart Government & Business programme.

## 8.2 Co-creation

The development of the real-time economy ecosystem should be promoted in close cooperation between different parties. This is the only way to take into account the needs of different parties and the interdependencies between the ecosystem's components. Tools and operating models to support cooperation and co-creation were created in the project. In co-creation, the aim was to brainstorm future solutions, produce concepts and solutions, and validate and commit to them.

Co-creation took place through trials, service design projects, customer insight studies and various events. The project's customer-oriented operating models also included active analysis of the business sector.

Among other things, the project produced guidelines for trials, PoC and security, which describe the principles of trialling and a process to support the implementation of trials. The guidelines describe trial design and planning, the collection and analysis of results and lessons learned, templates for evaluation, the principles of cooperation and compensation for trial partners, and information security and data protection practices to be considered in the trial process. The project also published a playbook for trials. An analysis of the relationship between trials and customer insights and a general-level model for co-creation were produced.

Trials were implemented at three levels:

- Technical Proof of Concept trials with trial partners through co-creation or results validation. Either authentic or synthetic data were used in the trials.
- Trials with trial partners to map development opportunities more broadly.
- Trials in collaboration with other projects to map network-based cooperation.

The following co-creation measures were implemented in the RTE project:

- A total of 42 trials involving 40 external partners were carried out.
- A total of 15 trial validation events were organised, with participation from 337 businesses.
  - Nine validation events were organised, involving 207 businesses.
  - After the trials had ended, six stakeholder events were facilitated for the validation of the trials, with participation from 130 businesses.
- The project solutions were presented to businesses at various events and meetings.
  - For example, the results of the ecosystem trial were presented at the AgriVenture event, the eReceipt solution was presented at the Matka Travel Fair, and the digital accounts were presented at the Tili- ja

- veropäivät event of the Finnish Financial Administration Association (Talouhallintoliitto).
- General presentations about the solutions produced by the project were given at the Tax Administration's event for software vendors (Ohjelmistotalopäivät) and at the SuomiAreena 2023 event.
  - Each team carried out several customer insight studies, co-creation workshops and co-operation webinars.
    - More than 250 individual participants were engaged in interviews and workshops as part of the customer insight studies.
    - The surveys received over 900 individual responses.
    - More than 1,000 stakeholders participated in development activities through customer insight workshops organised by the teams.
  - Three thesis projects, which were based on interviews and surveys with businesses, were carried out in cooperation with universities.
  - There were a number of regular collaborative forums with attendants from the private sector including:
    - Findynet working groups and cooperation forums, the XBRL consortium, the eReceipt Mirror group and working group, the e-invoicing forum
    - the Virtual Finland project, the transport ecosystem and the eFTI project
    - Sitra's project on the data economy roadmap, FINNPASS and new product passport networks
    - the data spaces working group of public administration and the forums of the Digitalisation of Life and Business Events programme office of the Ministry of Finance.
  - Dozens of stakeholders participated in the production of roadmaps for the further development of the Purchase to Pay component.
  - Key stakeholders were engaged and consulted on a thematic basis in project-wide live events.
  - The MiniHackaton event organised with businesses and other key stakeholders produced value propositions for RTE solutions to match the business needs of a commissioning organisation.
  - The project has facilitated further cooperation and trials with businesses beyond the scope of the RTE project.
    - The MiniSuomi trial environment is now also in use in NSG&B and EWC.
      - As part of the EWC pilot trial, Bosch, among others, has presented three different certificates for the Mini-Bank of MiniSuomi for the KYC process (account opening).
    - At the conclusion of the project, Finntraffic and SitraLab are also running trials in the trial environment utilising the existing applications available in MiniSuomi.
    - During the RTE project, dozens of organisations and their representatives have been introduced to the trial environment in conjunction with the trials.
    - The project implemented a total of 14 applications in MiniSuomi. For more information about the general offering of MiniSuomi, see <https://minisuomi.fi/>.
  - Interest groups were consulted and involved through the work of the management group, and there were also frequent bilateral discussions with individual interest groups.
    - The members of the management team participated in discussions on topics including the system model, data-driven business segmentation and the roadmap.

### 8.3 Communications

The project's brand and visual identity were developed in the early stages of the project and then used in both external and internal communication materials. The project had its own communication strategy and communication plan, which was updated in accordance with agile development principles.

The primary communication channel was the project website [www.yrityksendigitalous.fi](http://www.yrityksendigitalous.fi). The website was launched on 14 February 2022. The project's LinkedIn page @Yrityksen digitalous was used as the primary social media channel, and a decision was made to continue to update the page after the project has ended. In autumn 2024, the LinkedIn page had nearly 650 followers. Other social media accounts of the project included @YrityksenDigi on X (formerly Twitter) and @Yrityksen digitalous on Facebook.

The project produced infographics, introductory videos and demos about the trials as well as various webinar recordings. Video materials were uploaded on YouTube and embedded and linked from there to the project's website and social media channels.

Stakeholders were sent regular newsletters, one on the latest news on real-time economy, and one about purchasing, invoicing and payments. Quarterly reviews were organised regularly as external events. There were also subject-specific webinars, information events, workshops, events for invited guests, trial validation events and various stakeholder meetings.

The following communication campaigns for various target groups were implemented:

- 1 E-invoicing campaign
- 2 eReceipt campaign
- 3 Introduction to Peppol campaign

As the RTE project was funded by the EU Recovery and Resilience Facility (RRF), the communication guidelines for recipients of EU funding were taken into account in all communications. Recipients of EU funding have a general obligation to promote the visibility of the EU in their communications. One important obligation is for beneficiaries to display the EU emblem and an EU funding statement. In accordance with the guidelines, the European Union's emblem with the text "Funded by the European Union – NextGenerationEU" was used in the communications of the RTE project.

Internal communication channels included Teams, internal newsletters, teams' own weekly newsletters and team leaders' joint weekly meetings, project information events every other week, monthly live events for all project participants, sprint reviews organised at the end of the sprints, and ecosystem network meetings.

## 9 Lessons learned, experiences and recommendations in cross-administrative ecosystem development

### 9.1 Lessons learned from previous ecosystem projects

In the past ten years, ecosystem projects related to digitalisation have been undertaken in the public sector within the spans of governments' terms of office. Ecosystem thinking has progressed gradually but has often been limited to research or conceptualisation due to the lack of solutions to ensure the necessary legislative and technical interoperability conditions. A change towards an ecosystem-like operating model would also require changes in management

structures (e.g. joint management), in practices related to the use of data (e.g. data product management), and in shared tools and infrastructure interoperability.

The RTE project implemented ecosystem-like development both across administrative boundaries, i.e. between different agencies and ministries, and between public administration and private sector parties. The RTE project has been a pioneering project in cross-administrative and public/private ecosystemic development in Finland. The ecosystemic approach and development model is a completely new way of working.

Sections 9.1–9.4 describe the RTE project's lessons learned, experiences and recommendations for cross-administrative ecosystem development. It is recommended that these be used in future projects and follow-up work where a similar approach is applied.

Lessons from previous ecosystem projects were utilised in the RTE project. The lessons learned from earlier ecosystem projects on systemic change were applied as they became available during the project. In the ambitious AuroraAI project, digital infrastructure and an ecosystem management model were developed simultaneously. The final evaluation report of this visionary project recommended extensive ecosystem-level engagement and trials, which have also been promoted in the RTE project. Development proposals regarding management and goal-setting as well as matters related to the steering model were also taken into account in the RTE project. All responsible authorities were actively involved in decision-making at different levels of the RTE project. The private sector was represented in the management group and in the trials carried out in the project. The final evaluation report of AuroraAI recommended that goal-setting be approached dynamically and updated throughout the project based on lessons learned. The objectives of the RTE project were revisited during the project, and the practice of ongoing goal-setting was adopted.

The government programme for promoting digitalisation utilised systems change thinking, shared situational awareness and system modelling in the development of digitalisation. System modelling, which had been found useful in the programme, was adopted in the RTE project in order to develop a shared understanding of the complexity of the operating environment among the participants and to identify key opportunities for systemic change. System modelling helped the project's participants to perceive various interdependencies. It also helped to clarify strategic choices in terms of the focus areas of ecosystem development.

## **9.2 Experiences, lessons learned and recommendations related to governance structures**

The RTE project operated under the Ministry of Economic Affairs and Employment and it was led by the PRH under the Ministry's steering. Three ministries and five agencies steered by two different ministries were involved in the steering of the project, and the strategic management group also included seven interest groups. The participating agencies also had internal steering forums for discussions on the agency's perspective and opinions regarding the agenda items of the steering group of the RTE project. From the perspective of RRF funding, the Ministry of Finance has overall responsibility related to the Recovery and Resilience Facility in Finland, and the State Treasury manages and monitors the implementation of Finland's Recovery and Resilience Plan (RRP).

Due to the objectives included in Finland's Digital Compass ([Digital Compass roadmap](#)), the RTE project also had contact with the Coordination Group for Digitalisation. The Coordination Group for Digitalisation is a permanent interministerial working group in the area of digitalisation, data economy and

information policy. The Coordination Group for Digitalisation supports the work of the ministerial working group on social transformation in data economy and digitalisation. The aim has been to create a co-creation budget in Finland that would be targeted to support the promotion of cross-administrative and cross-sectoral interoperability.

The personnel of the RTE project was engaged in the project on an allocation basis which enabled them to carry on working in their respective agencies, and the project leads were also from the agencies in question. Content-related and procedural instruction in the project was delivered from within the project organisation. Several consultants also worked in the project under team-specific content coordination.

A change towards an ecosystemic operating model would also require changes in management structures. In the RTE project, all parties involved in the steering forums participated actively in the steering of the project. The project developed a joint management model that can be used in further work on the ecosystem. It is important that in post-project work, all participating organisations commit to the joint management model and its further development. Ecosystemic development requires genuine cross-administrative and open cooperation, communication and common policies through which all participants commit to implementing the changes in their respective spheres.

The lessons learned and recommendations of the RTE project for the administrative structures of cross-administrative projects:

- It is recommended that the organisational structure be designed to support ecosystemic development in its entirety before the launch of the project, so that work can start efficiently from the outset and that functional structures are in place for the exchange of information in a way that prevents siloed behaviour.
- Particular attention should be paid to jointly coordinated ecosystem-based resourcing, and how and at what intensity people should be allocated to the project in order to create the best conditions for the effective promotion of the project's objectives and task prioritisation. Key persons should be attached to the project at 100% allocation. From the point of view of efficiency, very small allocations should be limited to personnel in roles such as review roles. In addition, workplace well-being should be taken into account so that extensive multi-year projects have an HR expert who has centralised oversight of workplace well-being.
- It is recommended that the objectives be concretised well in advance. Clear, achievable and easily monitored indicators should be identified for the objectives. Dynamic goal-setting should also be facilitated so that external dependencies and changes in the operating environment, emerging development trends (e.g. use of AI) and their impacts on the objectives can be taken into account in multi-year projects. It should also be noted that it is possible to set goals of different maturity levels, provided that their relationship to the project as a whole is clear.
- There were no existing operating models for multi-agency joint procurements. Common procedures for joint procurements are needed, and competitive tendering should be carried out well in advance so that consultants can be engaged in the project from the beginning. More generally, procedures and interpretations of the Act on Public Procurement should be examined so as to ensure that they effectively support ecosystemic development and joint procurement in networks.
- Public agencies' licence to participate in ecosystem development during and after the project was not unambiguous. The current competence provisions had to be analysed in detail vis-a-vis the joint management model and the

tasks and roles identified in ecosystem development. Ecosystem-based development requires a new kind of role from authorities. It means new tasks for authorities, which, according to current requirements, have to be approved through legislation or by ministerial order. This enables continuous participation in the construction and further development of a shared ecosystem. Legislative barriers of this kind and other ways of facilitating participation should be examined more closely.

- A co-creation budget administered by the Coordination Group for Digitalisation for cross-administrative projects would better enable the overall management of digitalisation projects and the identification of dependencies, and it could help prevent piecemeal development and duplicated solutions between projects. The project recommends that the further development of digitalisation should not be focused on investing in the development of individual and non-interdependent business transactions. Instead, the existing building blocks developed in the project should be leveraged as much as possible. A comprehensive overview is needed instead of piecemeal digitalisation of business transactions. Real impact can be achieved through systemic benefits when digitalisation is advanced with a holistic approach and consideration of existing digital building blocks.

### **9.3 Experiences, lessons learned and recommendations related to co-creation between the public and private sectors**

The starting point of the RTE project was to develop solutions in cooperation between private and public sector parties so that the policies and solutions are based on practical consideration of businesses' needs.

The development of real-time economy and data economy requires both businesses and public agencies to adopt new operating models that increasingly emphasise network-based cooperation. Close-knit and open cooperation and time for discussions to develop a shared understanding are needed in strategies, coordination and development work.

The implementation of the new operating models started during the project, but the practical adoption of the operating models still requires systematic management and roll-out. Cultural change posed a challenge to development work during the project and will continue to affect the implementation of the joint management model after the project's conclusion. Change management should be promoted in a systematic and conscious way.

The lessons learned and recommendations of the RTE project for ecosystem-based co-creation:

- Cross-administrative multidisciplinary teams create significant value for co-creation and innovative solutions. Large and challenging concepts can be tackled through effective network-based cooperation.
- A shift from inclusion to genuine participation is needed to promote commitment to changes and the driving forward of concretely sought changes.
- Experimental and agile development is presently not an established development method in public administration. Effective trials require support and systematics as well as time to develop a shared understanding of large and complex concepts. A toolkit and procedures for co-creation in ecosystem-based development should be in place and available across central government. In co-creation, it would be important to have a shared open co-creation platform, which can be accessed by all relevant parties. At



a minimum, common rules for ecosystemic development between public administration and private sector should be produced for central government.

- Trials implemented in cooperation between the private and public sectors requires new operating methods and cohesive operating models for projects involving multiple authorities.
- Joint trials, workshops and customer insight studies such as interviews were found to be good methods in co-creation. The MiniSuomi trial environment offered an excellent practical space for co-creation. Service design and trial expertise should be ensured by appropriate resourcing in ecosystem-based development.
- Businesses and the municipal sector should be involved in development work from the goal-setting stage and the early stages of the solution design process in order to ensure that challenges and opportunities are understood and the changes affecting businesses can be described in a sufficiently concrete manner. It is advisable to validate outputs with customers as early as possible.
- “Patrons” appointed from businesses and interest groups could be closely involved in the practical work.
- Key stakeholders should be identified in the early stages of the project. Existing communication and cooperation channels of stakeholders should be utilised as widely as possible in order to raise awareness of the benefits and necessary changes as widely as possible, which can encourage operators to drive the changes forward.
- Customer insights and trials are linked – trials bring more customer insights, and sufficient customer insight is the starting point for successful trials.
- Trials are an inclusive way of learning, and they help to perceive systemic entities. Trials are also a cost-effective way to develop and test something that does not yet exist.
- It is essential to recognise the role of pinpointed trials as part of other development work and their co-effects. Feedback is also important: the lessons learned from trials must be identified as part of broader ecosystem development. The ecosystem trials carried out in the project helped to grasp the systemic nature of economy and the flow of information in the internal and shared processes of economic operators. Ecosystem trials were able to validate the interoperability of the proposed solutions developed in different parts of the project.

#### **9.4 Experiences, lessons learned and recommendations related to cooperation with other projects**

The RTE project cooperated with several current projects both nationally and internationally. There was also cooperation with the internal target state projects of the participating agencies.

Examples of experiences, lessons learned and recommendations related to cooperation with other projects:

- Cooperation with other projects enabled peer learning about developments in other countries and access to information about best practices.
- Cooperation helps to identify dependencies, avoid duplication and perceive larger entities.
- Cooperation enables the utilisation of synergies between different projects. Useful inputs can be shared between projects.
- It is important to clarify the roles, responsibilities and expectations between different projects from the outset of collaboration.

- Shared tools such as the MiniSuomi trial environment can help concretise the collaboration.

## **9.5 Experiences, lessons learned and recommendations related to project procedures, ways of working and interagency cooperation**

The RTE project established procedures and ways of working that were suitable for a cross-administrative project, as there were no existing operating models or tools suitable for projects implemented jointly by multiple agencies.

The lessons learned and recommendations of the RTE project for multi-agency projects in ecosystemic development:

- A shared situational awareness and big picture perception support common understanding and direction, and they are enabled by tools that are suitable for ecosystemic development. Maintaining a shared situational picture, taking interdependencies into account, ensures controlled planning and implementation of changes and eliminates duplication.
- The use of common systems for communication, work and project management from the outset of the project is essential.
- The project identified that dialogue around the common core substance of the ecosystem is essential for the success of ecosystem development. Sufficient time must be reserved for dialogue. Only through dialogue it is possible to understand the dependencies and impact chains of a complex ecosystem. The dialogue must include expertise covering all substance areas. Dialogic methods and skilful facilitation are needed.
- In a joint project involving multiple parties, it is important to establish a shared working culture and reconcile the needs of different organisations. Special attention should be paid to managing this.
- In a joint project involving multiple parties, it is recommended that procedures and tools that are suitable for ecosystemic development and available to all parties should be chosen together in the preparatory phase. Systems competence and tools suitable for system development are a prerequisite for efficient ecosystem development.
- The RTE project produced an extensive toolkit to enable co-creation at different levels. It is recommended that the models created and proven in the project be disseminated more widely in public administration.
- Proactive risk management can improve the likelihood of a successful project by identifying risks and implementing management measures before any risks are realised.
- Ecosystemic development is currently not well supported by the different operating models and processes of public agencies or the legislation that regulates public agencies' activities. For example, the implementation of data-driven business segmentation, which serves as the basis for ecosystem-based situational awareness and steering, was significantly slowed down by rigid processes in the disclosure of data from agencies.
- Roles, responsibilities, expectations, steering relationships and decision-making processes and procedures should be defined together at the start of the project and expectations should be discussed openly at different stages.
- The volumes and skills of human resources and the responsibilities of key personnel must be proportionate to the scope and objectives of the project. The joint prioritisation of tasks between the parties improves the efficiency of change implementation overall.
- It is recommended that a stakeholder analysis and plan and a change management plan be prepared at the beginning of the project, and they should be updated in a controlled manner during the project so that

changes in the operating environment and their impacts can be identified and assessed. In addition, the procedures for stakeholder cooperation should be agreed upon at the beginning of the project and sufficient resources should be allocated in relation to the objectives.

- In practice, for example, joint meetings can be scheduled much faster if all project participants have a shared calendar view.
- Shared physical workspaces for project personnel would make the work more efficient.
- Regular attendance days for all project participants were seen as an important and effective way of increasing shared understanding and working on solutions together.
- Broad-based and open inclusion of individuals in joint reviews is helpful.
- The work of the ecosystem development core team was an effective way of gaining a common understanding of the overall project and its dependencies among the RTE project's key personnel. However, creating the same level of understanding across the entire project is challenging, because it would require extensive joint work and discussion in a large, multidimensional project with varying personal allocations.
- So-called low-threshold working papers (documentation of emerging topics with work still in progress) proved to be a good way to gain a shared understanding and facilitate discussion about complex and evolving issues.
- From the perspective of the continuity of development and the desired benefits, cooperation between agencies and ministries must be further intensified, and the challenges related to funding, legislation, coordination of target states and time use must be solved in cooperation between agencies and ministries, and it must be ensured that solutions are taken forward into production.

## 10 Conclusions

### 10.1 Assessment of the achievement of the set objectives

In the project's view, all the objectives set for the project will be achieved by the end of the project. Some aspects of the assessment may appear open to interpretation due to the high generic level of the objectives. The high-level objectives could also lead to different expectations regarding the level of progress that should be achieved during the RTE project.

The objectives and the associated outputs will be discussed in the project steering group on 20 November 2024 and in the project management group on 11 December 2024. As part of the final report, the aim is to have the objectives and outputs approved in their entirety in the project steering group on 18 December 2024.

The RTE project's vision is a national secure real-time economy ecosystem that offers interoperability with other Nordic countries and EU member states by 2030. The aim of the project was to promote the digitalisation of businesses by facilitating the generation and automated transfer of electronic financial administration documents between systems and the management of corporate finances, create a basis for an ecosystem that enables the automated transfer of financial data and the production of services that support it, promote primarily the creation of market-based solutions and an infrastructure to enable seamless, real-time and secure automated transfer of data, and enable the establishment and operation of a company digitally and create a digital identity for the company. From the perspective of RRF funding, the two objectives described in section 2.2 were set for the project.

The objectives identified in the decision to set up the project (14 June 2021) were high-level objectives, and they were concretised in the early stages of the project by producing a target state document (Appendix 2), in which the high-level objectives were deconstructed into more concrete objectives, and acceptable outputs were defined for them. The target state document was approved by the project steering group in December 2021 and the updated document in December 2022. The objectives of the Born Digital component were further defined in the steering group in June 2023. The objective of creating a digital identity for a company, which was identified in the decision to set up the project, was not included in the detailed objectives described in the target state document, but the project nevertheless promoted the digital identity objective so that it can be implemented after the necessary legislative changes. The objectives of the Born Digital component were significantly affected by regulation following the revised eIDAS2 Regulation and its implementing provisions which progressed during the project.

The document on the second RRF target set for the end of 2024 will be discussed in the project steering group on 20 November 2024, and the achievement of the target will also be audited by an external independent party (BDO Oy). The audit report will be reviewed by the project steering group on 18 December 2024. The table in Appendix 5 contains a summary of the objectives in accordance with the target state document, the related outputs and an assessment of the achievement of each objective. The output report included in Appendices 6–14 to the final report contains a more detailed assessment of the achievement of the objectives and outputs of each project area.

A special feature of the RTE project was that the development work was carried out simultaneously in entities at different maturity levels at all stages of research and development. The objectives and the related indicators were of different levels according to the entities' maturity levels. For example, clear volume targets had been set for e-invoices and e-receipts for increasing the utilisation rate. In some entities, the objective was to create models or describe solutions for the target state.

Research and conceptualisation carried out during the project focused on gaining an understanding. Legislative work and trials in preparation for productisation and practical implementation produced knowledge and highlighted requirements for further development. Steps towards practical implementation during the project were primarily focused on digital business transactions and accounts.

The joint management model and the ecosystem development management tools developed to support it enabled topics to be grouped according to time spans and stage-specific objectives. The tools helped to target dialogue on appropriate topics and develop an understanding of the interdependencies and chains of impacts that exist in the complex operating environment. The whole and its components were informed by shared ecosystem thinking and practices and operating models required by systemic change. Operating models for ecosystem-based co-creation had to be created almost from scratch during the project, as there were hardly any suitable existing models.

In line with the objective set for the project, the project succeeded in developing a joint management model and tools that help in the steering of the ecosystem and achieving the vision for 2030, and the necessary cultural change began to take shape during the project. A broad-based cultural change still requires a lot of systematic efforts. Once the cultural change and ecosystem thinking take root beyond the project, the pace and fluidity of development are expected to increase significantly.

## 10.2 **Current state of real-time economy at the project's conclusion**

Digitalisation and the development of data economy have reached a stage where achieving their full benefits requires a fundamental change in the ways in which economy and society function. The era of piecemeal solutions is over, and the next digital leap will be achieved by adopting new operating models that are co-developed in networks. Digital services and solutions must work seamlessly together. Interoperability creates conditions for Finland's competitiveness and growth.

Real-time business economy is an ecosystem built gradually around digitalised financial management in businesses. In the first phase, the development of a real-time economy ecosystem focuses on building a functioning minimum viable ecosystem. It consists of structured business documents (procurement messages, e-invoices, e-receipts), their process digitalisation, and an infrastructure that enables the sharing of business documents and accounting information in a structured format for different purposes.

Based on structured financial information, reporting to authorities is developed in accordance with the once-only principle so that the reporting burden for businesses is reduced. At the same time, business-to-business information exchange is promoted to support the development of the digital identity for businesses and the wallet-based transmission of confidential information, and the evolution of an ecosystem in line with the eIDAS2 Regulation. This will pave the way from a minimum viable ecosystem to greater automation and reliability in business transactions.

The long-term goal is to expand the real-time economy ecosystem around the digitalisation of financial administration as a whole. The structural components and solutions of the real-time economy ecosystem are designed to be scalable so that they facilitate digitalisation in other ecosystems as well.

The RTE project created the necessary conditions and structures for continuing the work on real-time economy towards the 2030 vision and, ultimately, for the significant productivity benefits the vision's realisation will offer. In the next few years, determined efforts should be made to develop and implement structured business documents in accordance with the planned measures, to prepare and implement work aimed at streamlining official reporting, and to enable companies to use digital wallets.

In order to ensure the benefits and value creation of the ecosystem and to enable expansion, it is essential that the outputs of the RTE project be utilised and developed in further work – for example, the joint management model and tools produced for ecosystem steering and co-creation, and all the studies and solution proposals produced by the project's substance areas. At a later stage, investment is needed in the expansion of the ecosystem's joint management model in order to produce more value for the ecosystem's members.

The minimum viable ecosystem can be seen as the first step in the development of comprehensive digitalisation for all businesses. A comprehensive ecosystem should be grown from the minimum viable ecosystem to include additional business transactions, each time making use of the previously developed building blocks. In this way, a comprehensive ecosystem grows through smaller, incremental system investments or new types of system connections, which allows businesses to optimise their future investments in digitalisation in a cost-effective way.

### **10.3 The real-time economy roadmap for further development**

In spring 2024, the project produced a joint roadmap on measures for the development of real-time economy in 2025–2030. Specifically, the roadmap describes the implementation plan for the measures identified as critical in the target-setting and the building blocks of the minimum viable ecosystem. In the coming years, the roadmap will serve as a basis for coordinating the development of the ecosystem and it will help operators anticipate future changes. The roadmap is a dynamically updated tool that describes the development measures needed in that moment to achieve the vision and their schedule.

The roadmap was produced in order to reconcile the schedules of planned changes so that they can be realistically implemented both in public agencies and in businesses. In addition, the roadmap was used to clarify the interdependencies between the implementations of different components. From the perspective of public agencies and businesses, the roadmap also visualises the development in a way that allows it to be examined simultaneously, which gives operators important visibility of developments and requirements in the coming years and helps them prepare for the changes. The roadmap is described in more detail in Appendix 6.

### **10.4 Ongoing development after the project's conclusion**

The project produced a list of the outputs to be maintained and requiring further development, and parties responsible for this work. The project will ensure the transfer of the outputs to these parties and their induction during the project and thereafter to the extent necessary. After the project's conclusion, key personnel from public agencies who worked in the project will be responsible for the transfer of the outputs and induction to them.

The project produced a steering model for the real-time economy ecosystem and for the coordination of its further development. The steering model describes the premise of ecosystem steering and how it should be carried out in practice and organised so that the ecosystem can function and be developed in an efficient and goal-oriented manner. The steering model describes the roles and responsibilities of joint management: who is responsible for each component of the ecosystem as part of the broader real-time ecosystem development. The steering model also describes the shared working principles, i.e. how the members of the ecosystem will work together, and the co-creation procedures and rules of the parties participating in the steering and development of the ecosystem.

At its core, ecosystem-based steering means examining the states and digital capabilities of the participating businesses. In management, the starting point is to promote the development of digitalisation in businesses so that the quality of business-to-business transactions improves and businesses can interact and generate added value to their full potential. Maintaining a real-time situational picture of the business sector makes it possible to set goals and plan measures based on information and the actual situation in the sector.

In accordance with the steering model, the coordinating authority is responsible for maintaining the situational picture of the business and ecosystem environment and the associated roadmap and goal-setting. The project developed tools for this task. A new function for the coordination of the ecosystem's development will be established at the PRH, and the PRH's new task will be set out in law through the bill (HE 117/2024 vp). The bill was approved by Parliament on 12 November 2024. The bill also contains proposals for financing the maintenance and development of digital business documents, where the responsible party is the State Treasury, and for further work aimed at streamlining official reporting, where the responsible party

is the Tax Administration. The bill will be processed as budget legislation, and it will ensure the funding of the follow-up work for the further work packages presented in the Act for 2025.

Solutions to build the RTE ecosystem are promoted in accordance with the steering model in development teams or projects. As a result of the project's steering group work, the responsibilities of the development teams were agreed so that the State Treasury is responsible for the development working group for business documents and the Tax Administration is responsible for further development of solutions for the target state of financial information sharing and reporting. One of the tasks of the eIDAS2 implementation project is to promote possibilities for legal persons to use e-services. The LPID launch will be implemented in the project.

Development teams and projects will evolve according to the state of the ecosystem. There could be new development teams, some of the teams could merge, and some teams could end if active measures are no longer needed. Each responsible authority of the group is responsible for ensuring that the development group promotes solutions and measures in accordance with the common goal-setting and roadmap of the RTE ecosystem.

When the ecosystem is ready for expansion, it should be examined especially from the point of view of the entire life cycle of businesses, and it should be assessed which building blocks businesses need so that the next investment (system investment or new types of system connections) is as small as possible while bringing maximum benefits. In the future, the digitalisation of each new business transaction will require less additional investment, as the growing ecosystem is able to utilise the building blocks that are already in place.

## **Appendices**

1. Decision to set up the Real-Time Economy project
2. Target state of real-time economy
3. RRF 2022, description of the e-invoicing ecosystem
4. RRF 2024, basis for digital infrastructure
5. Realisation of the objectives and outputs of the RTE project
6. Joint management model for the real-time economy ecosystem
7. E-invoices
8. Procurement messages
9. E-receipts
10. Target state for the dissemination and reporting of information
  1. The Annual Accounts Register project
  2. Target state of consent-based information sharing
  3. EU digital wallets – opportunities for businesses and public agencies
  4. Communications



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