REAL-TIME ECONOMY:
PROPOSED VISION AND ROADMAP FOR THE BALTIC SEA REGION

VISION DOCUMENT
Full official name: "Harmonised vision and a roadmap for the development of the RTE Economy in the BSR"

within the project "REFORM/SC2021/092 Supporting productivity and competitiveness of Estonian SMEs through Real-Time Economy and single contact point digital solutions"

2023

Glossary

Term	Definition
AI	Artificial Intelligence
ADEX	Asynchronous Data Exchange
AP	Access Point
API	Application Programming Interface
APEX	API Exchange
B2B	Business-to-business communication/information/data exchange
B2C	Business-to-consumer communication/information/data exchange
B2G	Business-to-government communication/information/data exchange
Baltic API	Baltic standardised Application Programming Interface that can be developed as an extension of Nordic standardised Application Programming Interface to cover the whole Baltic Sea region
Beneficiary	Ministry of Economic Affairs and Communications of the Republic of Estonia
BIS	Business Interoperability Specifications
Bolagsverket	The Swedish Companies Registration Office
CB	Central Bank
CEF	Connecting Europe Facility
CEN	European Committee for Standardisation
DEA	Digital Economy Agreement between Australia and Singapore
DGA	European Data Governance Act
DGB	Digital Government Blueprint, Singapore
DG REFORM	The European Commission's Directorate-General for Structural Reform Support
DGE	Digital Gateway for Enterprises
DMA	Digital Market Act
DPP	Digital Product Passport
DSA	Digital Services Act
DSS	Digital Service Standards, Singapore

Term	Definition
D4E	Data for the Energy Union
eCMR	An electronic version of the consignment note used under the Convention on the contract for the International Carriage of Goods by Road convention when transporting goods by road
EDI	Electronic Data Interchange
EEA	The European Economic Area
eFTI	Electronic Freight Transport Information
EHDS	European Health Data Space
EHF Billing	Implementation of EN 16931 Electronic invoicing according to EU Directive 2014/55/EU for the Norwegian market
e-ID	Electronic Identification, an eIDAS building block
eIDAS	European Framework for electronic Identification, Authentication and Trust Services
eKYC	Electronic Know Your Customer
EMDS	European Mobility Data Space
EMSWe	European Maritime Single Window environment
e-receipt	A structured, standardised machine-readable document that contains payment information in addition to e-invoice information
ERG	E-invoicing Registration Grant
ERP	Enterprise Resource Planning software
ESAP	European Single Access Point
ESG	Environmental, social and corporate governance
EU	European Union
EUSBSR	European Union Strategy for BSR
eWallet	Electronic Wallet, an eIDAS building block
GAIA-X	Digital governance initiative project initiated by the European Union
G2B	Government-to-business communication/information/data exchange
G2G	Government-to-government communication/information/data exchange
GDPR	General Data Protection Regulation
GovTech	Government Technology Agency, Singapore

Term	Definition
GS1	Global Standards 1
HCF	Hosting Certification Framework
IMDA	Infocomm Media Development Authority of Singapore
IMT	Interoperability Maturity Tools
IMAPS	Interoperability Maturity Tools for Digital Public Services
INFOBALT	Information and Communication Technology (ICT) Industry Association
IoT	Internet of Things
KPI	Key Performance Indicator
KYC	Know Your Customer
LIKTA	Information and Communication Technology (ICT) Association, Latvia
MDMS	Multimodal Digital Mobility Services
MNC	Multinational corporation
MS	Member State
NIST	SP 800-63 US National Institute of Standards and Technology (NIST) Digital Identity Guidelines
Nordic API	Nordic standardised Application Programming Interface developed through Nordic Smart Government and Business programme
NSG&B	Nordic Smart Government and Business
NTP	Networked Trade Platform
PA INNO	Policy Area of Innovation of EUBSR
PEPPOL	Pan-European Public Procurement Online
PoC	Proof of Concept
PwC	PricewaterhouseCoopers
RTE	Real-Time Economy
RGP SIA	Lithuanian Data Analysis Solutions company
SAF-T	Standard Audit File for Tax
SGTS	Singapore Government Tech Stack
SMEs	Small and medium-sized enterprises
STP	Single Touch Payroll

Term	Definition
OOP	Once-Only Principle
VAT	Value-added tax
WoG	Whole-of-Government
X-Road	Estonian e-government PKI data exchange layer allowing G2G, B2G and B2B trust creation

Executive summary

Purpose of the report

The current "Harmonised vision and a roadmap for the development of the RTE Economy in the BSR" is a part of the project "Supporting productivity and competitiveness of Estonian SMEs through Real-Time Economy and single contact point digital solutions" under the framework DG REFORM (REFORM/SC2021/092) granted to the Estonian Ministry of Economic Affairs and Communications.

Vision

This report presents a compelling vision for a Real-Time Economy in the Baltic and Nordic countries which is underpinned by seamless data space interoperability and efficient data management governance. This vision promises to **create a simpler business environment that is not only more productive but also healthier, easily operated and more sustainable**. This vision is achievable by tapping into the synergies between the data spaces, enabling entrepreneurs and businesses to gain valuable insights, inspire innovation, and foster data-driven decision-making. Leveraging standardised data and cutting-edge technologies such as Artificial Intelligence and IoT, entrepreneurs and businesses can automate non-productive work, manage risks, and navigate crises with greater ease. Governments have a critical role in driving this vision forward. They can deliver value-added e-services to businesses and standardise and digitise data exchange both nationally and across borders.

High-level roadmap

The current report defines five streams to implement the vision into practice. These are:

Stream 1 implements the shared vision for the Baltic Sea region and entails the creation of a governance body to oversee the development and coordination of regulatory frameworks.

Stream 2 prioritises the development of infrastructure and the facilitation of data space interoperability by enforcing standardised formats and protocols.

Stream 3 identifies potential innovation and funding opportunities, while encouraging technology adoption using AI and IoT.

Stream 4 focuses on accessing success by using key performance indicators and utilises feedback from the stakeholders to make adjustments to the plan as necessary.

Stream 5 evaluates the overall impact and added value, as well as identifies opportunities for scaling up successful initiatives.

Quick wins

The report presents the roadmap for the Baltic Sea region for the years 2023-2028. The roadmap suggests two low efforts that can generate significant value without requiring substantial resources. The first quick win proposes the establishment of an **RTE community of practice** to provide stakeholders with the possibility to connect, cooperate and share the best practices and knowledge. The second quick win recommends establishing a **Central Inventory of local technical RTE solutions for stakeholders** from each Baltic Sea region country. Such inventory will encourage participation in the active RTE development and reuse of solutions in the Real-Time Economy ecosystem.

Real-Time Economy building blocks

The building blocks of the Real-Time Economy architecture are e-invoicing, e-receipt, e-KYC, automated and real-time reporting, real-time supply chains, real-time product information and e-catalogues, e-procurement, environmental and sustainability reporting. The building blocks are also supported through e-ID, digital wallet and X-Road like structures.

Lühikokkuvõte

Aruande eesmärk

Käesolev aruanne „Läänemere regiooni ühtne visioon ja tegevuskava reaalajamajanduse arendamiseks" on projekti „Eesti väikese ja keskmise suurusega ettevõtete tootlikkuse ja konkurentsivõime toetamine reaalajamajanduse ja ühtse kontaktpunkti digilahenduste kaudu" (REFORM/SC2021/092) üks tulemitest. Aruanne on koostatud Euroopa Komisjoni struktuurireformide toe peadirektoraadi tellimusel Eesti Majandus- ja Kommunikatsiooniministeeriumile.

Visioon

Käesolev aruanne tutvustab Balti ja Põhjamaa riikiide reaalajamajanduse visiooni, mille aluseks on tõhus andmehaldus ning koostalitusvõimelised andmeruumid. Visioonis lubatakse luua lihtsam ärikeskkond, mis on produktiivsem, murevabam, lihtsasti juhitav ning jätkusuutlikum. Visiooni saavutamiseks on tarvis kasutada ära erinevate andmeruumide vahelist sünergiat, mis võimaldaks ettevõtjatel ning ettevõtetel saada olulist ja väärtuslikku teavet, toetaks innovatsiooni ning soodustaks andmepõhiste otsuste tegemist. Kasutades standardiseeritud andmeid ning kõrgtasemel tehnoloogiaid nagu tehisintellekt ja asjade internet, saavad ettevõtjad ja ettevõtted automatiseerida ebaefektiivset tööd, juhtida riske ning kriise lihtsama vaevaga. Avalikul sektoril on oluline roll visiooni juhtimisel ning elluviimisel. Avalik sektor suudab ettevõtetele pakkuda lisandväärtusega e-teenuseid ning standardiseerida ja digiteerida andmevahetust nii riigisiseselt kui ka piiriüleselt.

Tegevuskava

Käesolevas aruandes pakutakse välja 5 peamist meedet visiooni elluviimiseks:

Meede 1 abil rakendatakse Läänemere regioonis ühtset visiooni, mis hõlmab vastava juhtimisorgani loomist, kes koordineeriks visiooni elluviimist ning erinevate riikide õigusraamide koostööd ja arengut.

Meede 2 keskendub infrastruktuuri ning andmeruumide koostalitlusvõime arendamisele läbi ühtsete standardite kasutuselevõtu.

Meede 3 toob välja innovatsiooni- ja rahastamisvõimalused ning julgustab uute tehnoloogiate kasutuselevõttu tehisintellekti ja asjade interneti näol.

Meede 4 keskendub tulemuste hindamisele peamiste tulemusnäitajate kaudu ja ning edasise tegevuskava kohandamisele vastavalt sidusrühmadelt saadud tagasisidele.

Meede 5 abil hinnatakse üldisemat mõju ning lisandväärtust, samuti püütakse tuvastada uusi võimalusi edukate algatuste laialdasemaks kasutamiseks.

Esmased rakendusvõimalused

Aruandes esitatakse Läänemere regiooni tegevuskava aastateks 2023–2027. Tegevuskava pakub välja kaks esmast rakendusvõimalust, mis annavad olulise tähtsusega tulemuse, nõudmata seejuures märkimisväärset ressurssi. Esimene rakendusvõimalus on luua reaalajamajanduse kogukond, et anda sidusrühmadele võimalus omavahel suhtlemiseks, teha koostööd ning jagada parimaid praktikaid ja edulugusid. Teine rakendusvõimalus on luua keskne ülevaade/süsteem olemasolevatest reaalajamajanduse lahendusest iga Läänemere regiooni riigi kohta huvitatud osapooltele. Selline

koondatud lahenduste ülevaade julgustab aktiivselt osalema reaalajamajanduse arenduses ning lahenduste taaskasutamises.

Reaalajamajanduse valdkonnad

Reaalajamajanduse kontseptsioon hõlmab endas e-arveid, e-kviitungeid, e-KYC'd (KYC – tunne oma klienti protseduur), automatiseeritud ja reaalajas aruandlust, reaalajas tarneahelaid, reaalajas tooteinfot ja e-katalooge, e-hankeid, keskkonna- ja jätkusuutlikkuse aruandlust ning nimetatud valdkondade toetamist läbi e-ID, digitaalse rahakoti ja X-Tee sarnaste struktuuride kaudu.

Table of Contents

1. Introduction

Background

Real-Time Economy has become the prevalent theme all around the world in light of growing attention to automated and secure transactions, digital-only data retention and real-time communication. Real-Time Economy has the means to become one of the most advanced digital concepts with the goals to improve individuals' and businesses' lives and **move administrative processes into the background**, leaving more time and space for the strategic development of user-centric services.

Real-Time Economy provides countries with the possibility to ensure **economic recovery and sustainable growth, create new jobs and gain competitive advantage** on the global level as well as use **innovative and reusable platforms** to achieve cost efficiency and cooperative solution for all the involved stakeholders.

This report continues to examine the Real-Time Economy theme. This report is based on the Report on the state of play and preparedness for Real-Time Economy (RTE) in Estonia and the Baltic Sea region (BSR) countries[1].

Collaboration on a broader level

This report includes proposals for future collaboration in the Baltic Sea region, with the following countries involved: Estonia, Finland, Denmark, Sweden, Latvia, Lithuania and Poland. This report is presented by PwC and reviewed by the stakeholders in the final stage.

Objectives of the vision document

The objectives of this report include a proposal for a vision and a roadmap for the Baltic Sea region countries.

As businesses play a focal role in the creation of business activities, providing 2 out of 3 jobs[2], they are in the spotlight of the research and preparation of the report. Additionally, companies still experience difficulties in cross-border trading, taxation and efficient compliance with national regulations as well as the establishment of their digital identity, which are at the core of building a secure and transparent single market playground.

Next steps in the Real-Time Economy playground

This report is closely related to the following **Report on the Real-Time Economy validation model for innovative initiatives and services**. Whilst this report presents the proposal for the Real-Time Economy vision and roadmap as well as recommendations to the Baltic Sea region, the following report focuses on the Real-Time Economy validation model mechanism, as a tool to ensure the accuracy and reliability of the solution before its public launch.

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[1] Real-time Economy, State of play and preparedness for the Real-Time Economy in Estonia and the Baltic Sea region countries. (2023, February 15). https://www.realtimeeconomy-bsr.eu/news/state-play-and-preparedness-real-time-economy-estonia-and-baltic-sea-region-countries

[2] European Commission, Directorate-General for Structural Reform Support, Growth and business environment, 2020. (p. 6). https://commission.europa.eu/system/files/2020-07/ht0120284enn.pdf

2. Proposed vision on the Real-Time Economy development for the Baltic Sea Region countries

2.1 Vision

> Real-Time Economy, facilitated by seamless data space interoperability and efficient data management governance in the Baltic and the Nordic countries, creates **a healthier, easily operated, more sustainable and more productive business environment**. Businesses thrive by tapping into the synergies between the data spaces, gaining valuable insights that spark innovation and foster data-driven decision-making. Using standardised data, advanced technologies, such as artificial intelligence and IoT, enable the automation of non-productive work, support risk mitigation and crisis management. Governments drive this vision by offering value-added e-services to businesses, standardising and digitising data exchange, both nationally and across borders.

The vision is based on the following elements:

Data space interoperability and governance

Create partnerships and agreements between the public and private sectors across borders to unify data sharing and management and to foster a collaborative ecosystem that promotes growth. Commonly accepted data standards and formats are being developed and adopted to ensure seamless data exchange and access, thereby improving the overall effectiveness and efficiency of communication between different data spaces.

Empowerment and innovation of businesses

Implement policies and incentives that encourage green practices, new technologies and skills to promote sustainable development and help businesses achieve global environmental goals. Provide businesses with easy access to data spaces and analytical tools, driving innovation and data-driven decision-making so they can be more competitive in the global marketplace and respond more effectively to emerging trends and opportunities.

Advanced technologies and automation

Integrate AI applications across industries to improve productivity and optimise business processes, allowing companies to focus on strategic growth initiatives. Leverage IoT devices and platforms to facilitate real-time data collection and analysis across sectors, providing businesses with valuable insights to help them make informed decisions and streamline operations.

Secure data and ownership

Implement robust data protection measures to protect sensitive data and maintain user trust. This ensures that stakeholders trust the sharing of their information in an interconnected ecosystem. Define and enforce clear ownership and access rights to shared data to maintain control and prevent misuse, creating a safe and transparent environment that promotes trust between all parties.

Government facilitation and impact measurement

Develop and deliver value-added e-services to businesses that streamline administrative processes and improve efficiency, reducing time and resources spent on bureaucratic tasks. Encourage the introduction of standardised and digitised information formats, which promotes transparency and simplifies the exchange of information, enabling smoother and automated operations of companies across national borders.

2.2 Visualised vision statement
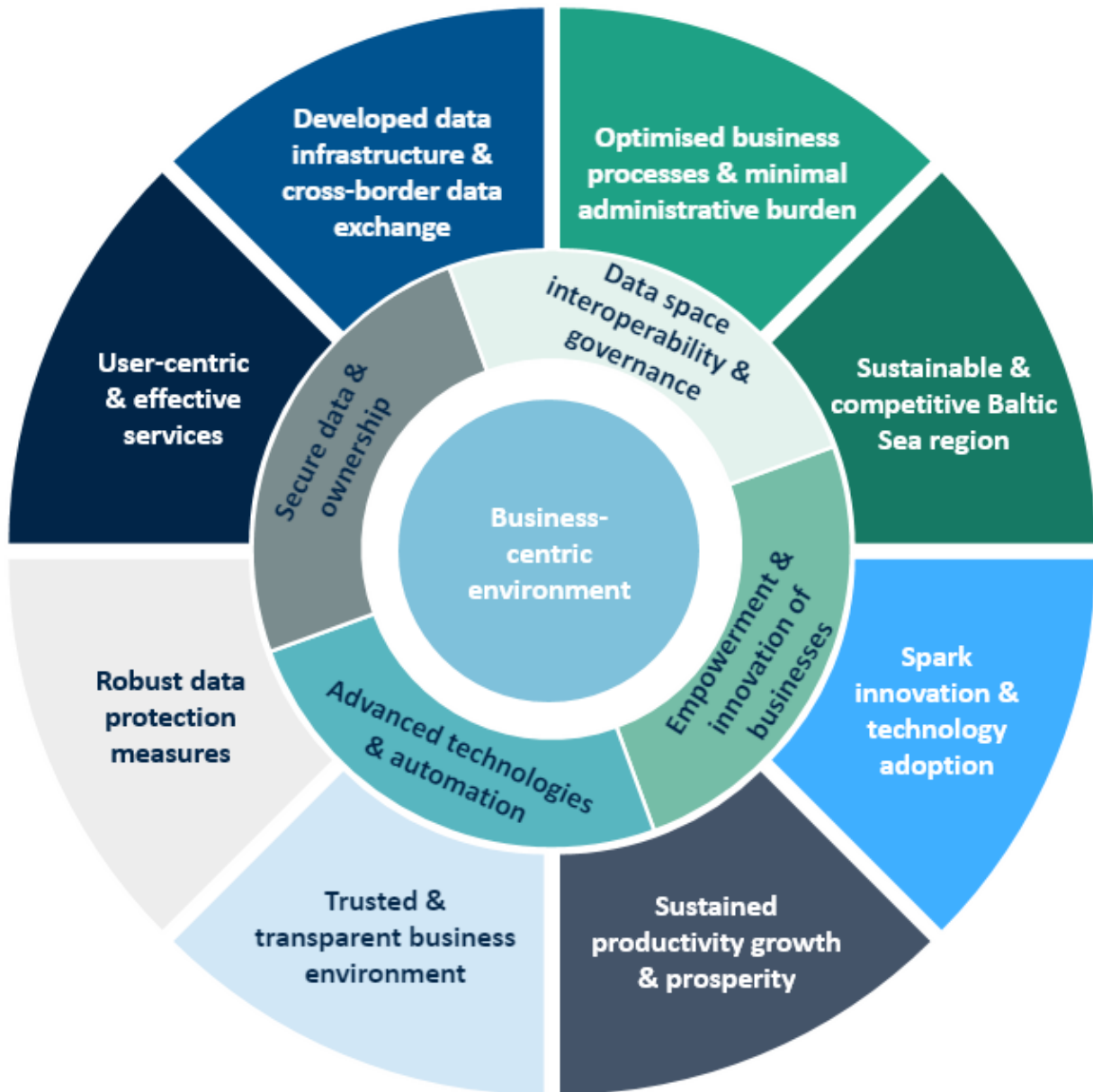
2.3 Roadmap for implementing the vision

This roadmap starts a journey to a healthier, easily operated, more sustainable and productive Baltic and Nordic region. Our focus is on Real-Time Economy and seamless data space interoperability. This part outlines a series of streams and actions designed to digitise our data-business environment and unlock new opportunities for growth and innovation. The streams are:

1. **Establish and implement the strategic initiative – 2024**
2. **Define and improve infrastructure and enable data space interoperability – 2025-2026**
3. **Spark innovation and technology adoption – 2026-2028**
4. **Measure success and adjust – 2024-2028**
5. **Evaluate and scale up – from 2028 onwards**

The streams with more precise descriptions are:

Stream 1. Establish and implement the strategic initiative – 2024

- **Form a governance body for the Baltic Sea Region to drive the implementation of the vision. The governance body has to include cross-sectoral representatives from each Baltic Sea region country.**
  - Secure funding and resources for the governance body to support the development of the ecosystem,
  - Establish a legal structure for governing body, define roles and responsibilities between participants,
  - Develop decision-making processes, a code of conduct, a dispute resolution process to support effectiveness,
  - Set up monitoring and evaluation mechanisms,
  - Take active participation in shaping the legislative environment and provide input to the EU initiatives, directives and regulations, such as participation in the Nordic Council of Ministers[3], Baltic Assembly[4] as well as other high-level policy-shaping networks.

- **Communicate success stories and best practices to encourage cooperation and keep the momentum**
  - Establish communication channels to ensure the facilitation of information flow,
  - Proactive communication and engagement, up-to-date informing system on the plan of action and pipeline, as well as ongoing discussion on the next steps,
  - Adopt RTE Community of Practice to share knowledge and elevate cooperation,
  - Ensure healthy, resilient and innovative spaces for knowledge sharing, such as GovTech Connect Community[5],
  - Agree on social media communications plan (LinkedIn, Twitter, websites).

- **Define data standards, formats and interoperability specifications**
  - Assess existing infrastructure and identify bottlenecks and quick wins,
  - Identify data types and domains, review existing standards and best practices, participate in new standards development, define data models and schemas, choose the appropriate formats, develop data interoperability protocols,
  - Implement data security and privacy measures,
  - Provide documentation and support, establish feedback and improvement process.

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[3] Nordic Council of Ministers. https://www.norden.org/en/nordic-council-ministers

[4] Baltic Assembly. https://www.baltasam.org/

[5] European Commission, GovTech Connect. Accessed on 13.4.2023. https://joinup.ec.europa.eu/collection/govtechconnect

Stream 2. Define and improve infrastructure and enable data space interoperability – 2025-2026

- **Define and improve data infrastructure and cross-border data exchange mechanism**
  - Define requirements for infrastructure, consider the scalability of the architecture,
  - Deploy components for the testing phase and concentrate on a user-centric approach (e.g., implementation of Baltic API),
  - Test and maintain interoperability, delivered in an agile environment responsive to mistakes. Involve participants from all Baltic Sea region countries and key industries,
  - Data access control and authentication process development with attention to user consent, open data and information reuse,
  - Facilitate the adoption of the infrastructure between stakeholders.
- **Drive the interoperability of data spaces by enforcing defined standards and formats. Ensure structural, behavioural and governance interoperability.**
  - Implement Interoperability Maturity Tools (IMTs) for Digital Public Services (IMAPS)[6],
  - Facilitate integration of data spaces by establishing working groups to enable semantic interoperability.

Stream 3. Spark innovation and technology adoption – 2026-2028

- **Implement incentives and funding opportunities for businesses to tap into data spaces to drive innovation**
  - Facilitate access to funding and resources between participating stakeholders,
  - Incentivise the development of use cases and pilot projects to accelerate transformation,
  - Establish technology hubs and arrange hackathons, to source the best talents and encourage creativity for complex solutions.
- **Encourage adoption of AI and IoT technologies across industries by providing funding opportunities (with a focus on joint procurement and ecosystem for joint ideation and development)**
  - Build partnerships that influence innovative decision-making,
  - Provide training support to public and private sectors to facilitate continuous learning, developing opportunities for positive change,
  - Establish feedback loops to present a coordinated, proactive and committed environment.
- **Implement policies and incentives to promote sustainable practices and green transition**
  - Promote success stories to accelerate attention and adoption,
  - Develop an incentive action plan to support the adoption of practices,
  - Plan for scalability and sustainability and develop technical tools to measure success.

Stream 4. Measure success and adjust – 2024-2028

- **Apply key performance indicators and regularly monitor the technical progress towards the vision**
  - Identify the percentage of documents presented in a standardised format, delay time for data transition, interoperability maturity level, data privacy and security level, scalability potential model, stakeholder engagement level, automation performance, ecosystem adaptation level and transaction excellence tracking.

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[6] European Commission, IMAPS. https://joinup.ec.europa.eu/collection/interoperability-maturity-tools-imts-digital-public-services/solution/imaps

- **Collect feedback from stakeholders and adjust the road based on lessons learned**
  - Establish a working group to support stakeholder management and communications,
  - Identify the governance structure of the aforementioned working group.

Stream 5. Evaluate and scale up – from 2028 onwards

- **Assess the overall impact and added value of the vision on the Baltic Sea region's well-being and economy**
  - Engage stakeholders and define further steps in development (e.g., Baltic API),
  - Expand the RTE scope to such uncovered areas, where smart usage of data can create added value (e.g., health care, social security, energy market),
  - Identify the next policymaking goals.
- **Identify opportunities for scaling up the successful initiatives**
  - Learn valuable insights from the evaluation process,
  - Set up an innovation hub on the Baltic Sea region level.
- **Promote continuous agile improvement and stakeholder collaboration**
  - Engage new possible stakeholders and empower new partnerships,
  - Scale RTE Baltic API ecosystem to the whole European Union level.

2.4 Visualised roadmap for the Baltic Sea region
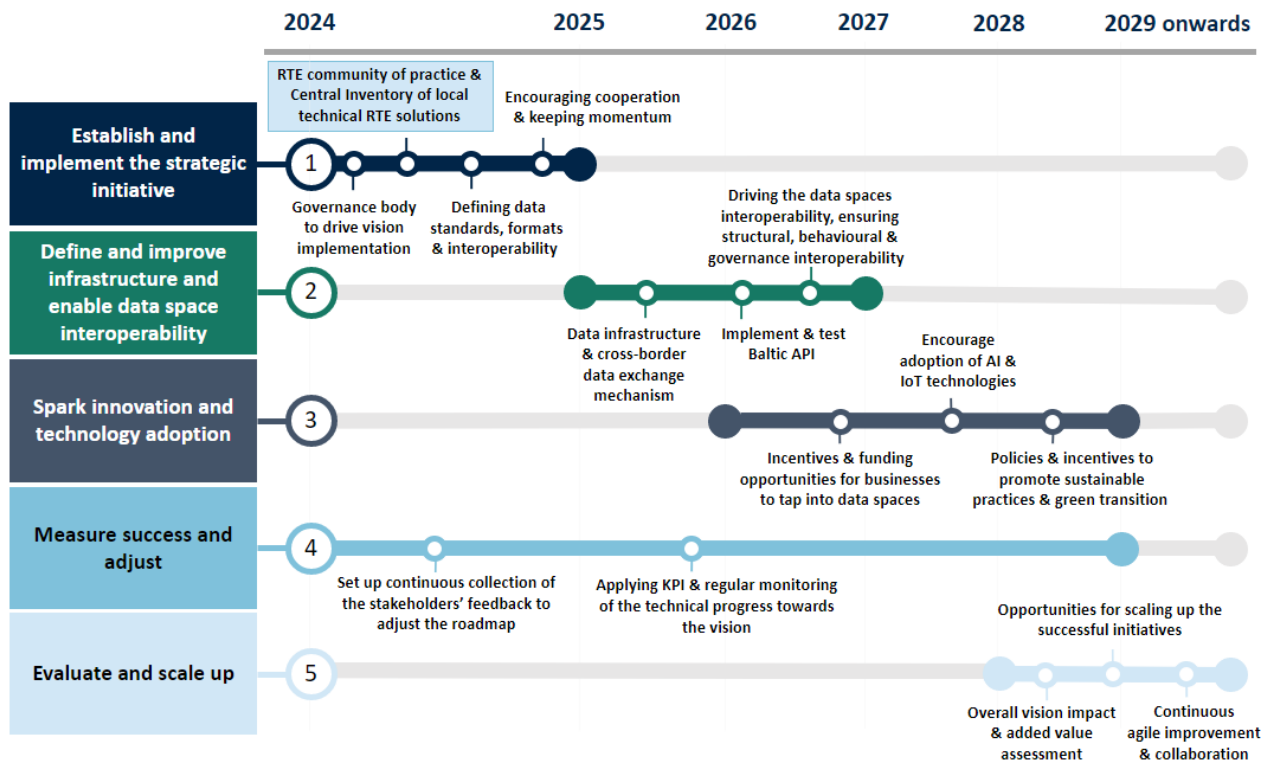
3. Proposed quick wins for the Baltic Sea Region countries

Quick wins (activities that do not require significant input but have a noticeable output) are highlighted in blue colour in the roadmap presented in Section 2.4. We recommend focusing on the following activities:

- **Establishment of RTE community of practice** – a community of stakeholders that shares the best practices with each other. This includes sharing resources and data, as well as creating a regulatory framework for implementing technical solutions both nationally and on the cross-border level. A strategic value creation model and benefits realisation plan are developed and act as a navigating point for further development of the solutions. Anticipated complexity includes agreement on the joint regulatory standards. It is important to pay special attention to innovative decision-making aimed at shaping a seamless Real-Time Economy playground.

- **Central Inventory of local technical RTE solutions** – a community of stakeholders in each Baltic Sea region country, that actively takes participation in the development of a Real-Time Economy ecosystem, researches the best practices, as well as suitable implementations of already existing solutions. This quick win is proposed as part of the **GovTech Connect Community**[7], which is a space for collaboration and knowledge sharing providing an information hub to develop the EU GovTech marketplace. Anticipated complexity includes the involvement of suitable stakeholders and seamless communication management. Attention points include the development of a cooperation model and stakeholder management.

Workshop[8] findings indicate that actions on the development of the Baltic Sea Region countries' ecosystem (extension of Nordic API ecosystem to cover Baltic Sea region[9]) are important to be implemented as soon as possible, as innovation will trigger the regulatory changes. It is vital to agree on shared solutions, semantic views, standards and legal basis in order to accelerate change towards Real-Time Economy.

Facilitation of roles between the participant countries to implement the best practices, that will also support national projects, and **building trust** among involved parties are key priorities in achieving a competitive and attractive partnership.

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[7] European Commission, GovTech Connect. Accessed on 13.4.2023. https://joinup.ec.europa.eu/collection/govtechconnect

[8] Real-Time Economy in the Baltic Sea region: vision and roadmap -workshop, (April 4, 2023).

[9] Bolagsverket, Nordic Governments API – business information.
https://bolagsverket.se/download/18.6e6c29d18481cff0f26cc/1676446269638/dialogpass-nordic-smart-api-2-feb-2023%20.pdf