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REPORT ON A REAL-TIME ECONOMY VALIDATION MODEL FOR INNOVATIVE INITIATIVES/SERVICES

STUDY REPORT

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within the project “Supporting productivity and competitiveness of Estonian SMEs through real-time economy and single contact point digital solutions”

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Glossary

Term	Definition
API	Application Programming Interface
GDPR	General Data Protection Regulation
RTE	Real-Time Economy
SME	Small and medium-sized enterprise
BSR	Baltic Sea Region

Executive summary

We developed an RTE validation model to help stakeholders to understand the scope, relevance, and dimension of RTE innovation. The validation process helps to assess the compliance of solutions with real-time economy goals, including identifying potential challenges with potential solutions before they are developed. The model helps to ensure that the innovation supports RTE development in the BSR region for businesses.

The validation model is divided into two steps:

1. Does the idea support RTE development? Defining the RTE scope is the first step.
2. Is this idea compliant with the criteria? Comparing the idea/innovation to the scope

In the first step, we present the definition and scope of the RTE solution for comparison with the validated solution. Next, the suggested validation dimension criteria are presented with their suggested weights and descriptions. For the assessment in the second step, we present seven dimensions to validate the innovation: technological, strategic, legal, cost-benefit, business- and client-centricity, environmental, and future potential. We also present a scoring table with a score threshold for innovation assessment.

Lühikokkuvõte

Selleks, et aidata osapooltel mõista reaalajamajanduse lahenduste juurutamise ulatust, vajalikkust ja mõõdet, töötati välja valideerimismudel. Valideerimisprotsess aitab hinnata lahenduste vastavust reaalajamajanduse eesmärkidega, sh tuvastada võimalikud väljakutsed potentsiaalsete lahendustega enne nende väljatöötamist. Mudel aitab tagada, et loodavad lahendused toetavad reaalajamajanduse arengut ettevõtjate seas Läänemere regioonis.

Valideerimismudel jaguneb kaheks etapiks:

1. Kas loodava lahenduse idee toetab reaalajamajanduse arengut? Määratletakse seos ning ulatus reaalajamajandusega.
2. Kas loodava lahenduse idee on vastavuses hindamiskriteeriumitega? Hinnatakse ning võrreldakse kriteeriumitele vastavust ning tulevikupotentsiaali.

Esimeses etapis antakse ülevaade reaalajamajanduse lahenduse definitsioonist ning ulatusest, millega valideeritud lahendust võrreldakse. Seejärel esitatakse soovituslikud valideerimisdimensiooni kriteeriumid koos nende kirjelduste ning osakaaludega. Teises etapis antakse ülevaade seitsmest valideerimisdimensioonist, mille alusel loodavaid lahendusi valideerida: tehnoloogiline, strateegiline, õiguslik, kasumlikkus, kasutajakeskus (ettevõtte ning kliendi vaatest), keskkondlik, tuleviku potentsiaal. Lisaks tutvustatakse hindamiseks kasutavat töövahendit ning hindamise lävendit.

Background

Why there is a need for an RTE validation model?

The usage of a validation model to evaluate an emerging RTE idea is an important step in the process because it helps to ensure that the new idea supports the RTE goals and development. In addition to that, the validation process helps to identify any potential issues or problems with the solution before the beginning of the solution development or implementation, which can save time and money in the long run. It also helps to ensure that the solution meets the requirements and expectations of the small and medium enterprises, and that it is aligned with industry regulations and standards. Moreover, the proposed validation model would help the stakeholders to prepare for presenting the idea, for example, at RTE-themed hackathons.

Risks of failing to have a validation model

Any kind of public funding evaluation process is made more transparent with the validation model. From the public sector's point of view, the validation model helps to assess if the innovation supports RTE goals. The validation model also helps to build confidence in the solution and ensures that it will perform as expected in real-world scenarios, thus reducing the risks associated with the new idea or innovation. Innovation without a functional validation model can lead to increasing process costs or disruptions to business. The validation model also enables idea creators to evaluate their idea before beginning to work on it.

Validation model

RTE validation objectives

The objective of the RTE validation model is to see whether the emerging new ideas are worth developing and support the RTE goals, and to make RTE implementation for different end users stable and standardised considering the complicated nature of the concept. The goal of the model is to validate whether project ideas are RTE-related and how they can contribute to the overall RTE development in the BSR, focusing on relevant principles, tools, regulatory frameworks and standards. The model aims to give a standardised reference on these categories and ensure that these categories comply with the Real-Time Economy principles and that the selected initiatives add value to the rapid transition to RTE in the BSR.

The validation model describes relevant principles in Real-Time Economy solutions that can be compared to new RTE ideas, such as standardisation, use of only machine-readable data, common semantics, and for example, interoperability layer. It also defines the tools used and terms and conditions for legal aspects of the implementation. The complete model includes analysis and development of a best-case scenario model (including a comparison of alternative solutions and involvement of relevant stakeholders for selecting the appropriate model) for the Real-Time Economy validation model.

RTE validation assessment team: composition & division of tasks

The validation model is divided into seven dimensions covering the key elements of RTE. The dimensions are **technological, strategic, legal, cost-benefit, environmental, business- and client-centricity, and future potential**. Each dimension will be defined by a specific set of criteria.

Each criterion has **a pre-assigned weight** and is scored on a scale from 1 (the lowest) to 5 (the highest) allowing the evaluation of the RTE idea and innovations.

As the division is made up of different fields of business, a company can define how to set up the team for validation; however, the aim is to create the model so that everyone can use it to assess their innovation. In an ideal scenario, the legal and regulatory aspects should be assessed by legal experts, whereas the cost-benefit analysis done by accounting professionals in close cooperation with technical specialists (for example, data engineers and integration consultants). Ideally, the **assessment team is formed of legal, technological, financial, and environmental experts**. However, **the model gives support to non-professionals also**. Each member's skillset can be assessed individually to see if it matches the RTE implementation recruitments. For example, technical experts should have experience in APIs and integrations while legal experts should have knowledge about data protection.

RTE validation: process steps

We present **two steps to form a model for RTE validation**. The first step is to analyse if the idea or solution that the model is applied to is in the scope of the Real-Time Economy or not. For this, the scope and definition of the Real-Time Economy is given. Next, we analyse the solution per different fields of criteria to make the implementation effective on various dimensions.

The two steps of the validation model are presented below:

1. Does the idea support RTE development? Defining the RTE scope is the first step.
2. Is this idea compliant with the criteria? Comparing the idea/innovation to the scope

First step: Does the idea support RTE development or not?

When we define if an innovation or idea supports Real-Time Economy development or not, **there is a need to identify characteristics that separate RTE solutions from other technological solutions**. Real-Time Economy refers to a fully automated digital economic system where information about invoicing, receipts, reporting, and taxation is transferred in real time between different operators in the system. In the aforementioned description, suppliers, buyers, financial institutions and the public sector, such as tax authorities, can share information seamlessly. This requires the systems and reporting encoding to be in line with one another and standardised.

When evaluating if an idea's solution supports RTE development or not, the presented scope is observed and compared to the innovation in hand. Based on the scope defined, the fundamental attributes of the RTE solutions are **complete automation of economic processes in real time** between different operators, standardised and in-line encoding and reporting among the operators, and seamless usage of public and private sector information from several sources. These attributes are then compared to the innovation in hand to define if the idea supports RTE development and goals.

In order to identify whether a certain idea supports RTE development, the following questions should be answered:

1. **Data in scope.** Does it cover economic processes that are related to the exchange of business data (e.g., invoices, receipts, transportation documents, digital product passports, data-driven reporting and value-added services based on exchanged business data)?
2. **Information exchange.** Does it aim at real-time and seamless exchange of data?
3. **Reduction of burden.** Does it result in a decrease of the administrative burden for the enterprises?
4. **Innovation.** Does it result in something new or innovative that has not been implemented in the business environment either nationally or internationally?
5. **Interoperability.** Does it aim to enable smooth integration with existing standards, processes and systems? We recommend completing the **Interoperability Maturity Assessment of a public service** (can be applied both for public and private services).[1]

Only in case if **the answer is "Yes" to all 5 questions**, we can proceed with a more detailed assessment. If the answer is "No" to at least one of the questions, the idea should be returned to further rework prior to a more detailed assessment.

Second step: Is this idea compliant with the criteria?

For the validation, we present different validation criteria to be assessed in the idea assessment. These criteria are divided based on their nature in different fields of business and should be assessed in RTE validation. The goal for the criteria presentation is that anyone could assess if the idea supports RTE development. There are different divisions of the criteria based on the attribute nature. We analyse **seven dimensions of the validation criteria.**

RTE validation criteria

For the validation, we divide the validation model into seven dimensions covering the key elements of RTE, where each dimension will be defined by a specific set of criteria. Each criterion would have a pre-

[1] Interoperability Maturity Assessment of a Public Service. https://joinup.ec.europa.eu/collection/interoperability-maturity-tools-imts-digital-public-services/solution/imaps/about & https://joinup.ec.europa.eu/collection/interoperability-maturity-tools-imts-digital-public-services/about

assigned weight and would be scored **on a scale from 1 (the lowest) to 5 (the highest)** allowing the evaluation of the RTE initiative and services.

A more exact scale would look as follows:

1 – the idea does not match the criterion at all

2 – the idea badly matches the criterion

3 – the idea matches some important aspects of the criterion, but there is a significant space for development

4 – the idea significantly matches the criterion, except for several insignificant deviations

5 – the idea fully matches the criterion

The seven dimensions of the RTE validation model criteria are presented below:

1. Technological
2. Strategic
3. Legal
4. Cost-benefit
5. Environmental
6. Business- and client-centricity
7. Future potential

Based on the criteria and scoring provided by the model, new emerging ideas are to be assessed before more thorough implementation. For example, if a company has an idea that they think would support RTE development in the BSR region, they could use the scoring table to assess their solution. Total scoring is assessed as the sum of weight and scoring products. **The formula for the scoring is the following**:

Score (Criteria 1) * Weight (Criteria 1) + Score (Criteria 2) * Weight (Criteria 2)…Score (Criteria n) * Weight (Criteria N)

Based on the aforementioned scoring systems and formula, innovation owners can assess their technological scoring as follows:

Table 1: Scoring table example on technological criteria

Criteria	Score (1-5)	Pre-assigned weight	Criteria score
Interoperability	4	5	20
Security	5	5	25
Scalability	2	5	10
Automation	3	4	12
Machine readable	4	4	16
Extendibility	4	3	12
Standardization	3	3	9
Innovation	5	2	10
Maturity	2	1	2
Total score (out of 160)			104

In this example scenario, the innovation received a technological score of 104 out of 160. With a similar format, each criterion can be assessed based on suggested weights and innovation owners' vision on scoring. **Seven dimensions and their criteria with their weights are presented below.**

Technological

Digitalisation is the centre of RTE innovations and ideas and the key part of the validation model. As the essence of RTE is to digitalise, automate and standardise the data exchange processes, it is important to assess the technological criteria. The table below shows the criteria for the technological dimension of the RTE validation model and a weight for each criterion. The model's user can assess the scoring on a scale of 1-5 of each criterion with the help of statements listed for each criterion below.

Criteria	Criteria evaluation statements	Weight of the criteria
Interoperability (including API)	• Idea/Innovation is dependent on one specific service • Innovation can be made compatible with existing systems • Innovation is compatible with widely used standards • Innovation systems can connect and communicate with other systems/processes already in place • There are barriers limiting this innovation	5
Security	• Innovation follows data preservation and portability principles • Solution is overall safe from the technological perspective	5
Scalability	• Innovation can handle national/regional traffic loads • Innovation has an existing strategy to cope with a growing user base	5
Automation	• Processes on the initiative are automated • Innovation does not require human interference to work • Innovation can exchange data in or near real-time	4
Machine readability	• Data in the innovation is machine readable • Data in the innovation can be seamlessly processed by computer	4
Extendibility	• It is possible to add new functionalities or requirements to the innovation without needing to rework core modules	3
Standardisation	• Innovation increases the level of standardisation in the area it is applicable	3
Innovation	• Innovation improves existing technologies • New technologies require the implementation of the initiative	2
Maturity	• Innovation has been tried in the real environment • Time needed to reach the production stage is known	1

Strategic

Different RTE initiatives and services may vary in their strategic fit based on the targeted area and processes, provided benefits, duration of implementation and other factors. Therefore, it is important to evaluate not only whether the emerging idea aligns with the overall RTE vision and roadmap but also

whether it is **relevant from the perspective of separate countries** within the region. This dimension will provide flexibility in evaluating and scoring the above-mentioned strategic fit while also putting **a sufficient focus on the short- and long-term benefits of initiatives** to separate quick possible wins from major implementation projects and select the most strategically relevant solution at that point in time. The table below describes the RTE validation model's strategic criteria and their importance weight.

Criteria	Criteria evaluation statements	Weight of the criteria
RTE vision and roadmap alignment	• It is aligned with a long-term RTE vision and roadmap • Innovation fits into existing and planned initiatives	5
Regional relevance	• Innovation is applicable across BSR instead of one country • Innovation matches with BSR countries' RTE priorities	5
Implementation duration	• Innovation's implementation duration is known • it is known if innovation is implemented in phases or all at once	4
Systems adoption	• Innovation can foster the adoption of other RTE systems • Innovation can serve as a basis for the development of other more specific systems	3
Resources of national authorities needed	• Innovation requires resources from national authorities	2
Transparency and trust	• Innovation increases society's transparency • Innovation increases manual input needed which allows increased trust	2

Legal

Considering varying local regulations within the BSR countries, the RTE initiatives should be evaluated taking it into account as well. To enable regional system integration and smooth data exchange, it is important to ensure that the required data for the initiative (or data exchanged through it) would conform with the local and regional laws, most importantly including GDPR and information security standards. Below are the criteria for the legal dimension of an RTE validation model:

Criteria	Criteria evaluation statements	Weight of the criteria
Legal compatibility	• Innovation is compatible with the existing legal landscape within the BSR countries, or they have mapped the regulations that need to be changed in order to implement the solution	5
Data privacy standards compatibility	• Innovation is aligned with the data privacy standards within different BSR region countries • Innovation is GDPR compliant	5
Information security standards compatibility	• Innovation is aligned with information security standards within different BSR region countries	5

Cost-benefit

An important aspect of any initiative or investment is its **monetary value**, i.e., how much will it cost to implement and what benefits will it bring. RTE strives not only to reduce financial, operational, and labour costs but also to increase time and resource savings. Therefore, it is important to perform the cost-benefit analysis for each of the initiatives – an initiative might seem expensive yet the benefits it brings could significantly outweigh the investment cost needed for its implementation. Here are the criteria for a cost-benefit dimension of the RTE validation model:

Criteria	Criteria evaluation statements	Weight of the criteria
Implementation cost	Costs for the implementation are known Costs of similar existing solutions are known	5
Time and resource savings	Innovation creates time savings Innovation creates material savings	4
Maintenance cost	Maintenance costs in the innovation are known Maintenance costs of similar solutions are known	3
Price/costs for customers	Costs for customers (consumers or other businesses) are known, such as transition costs, software costs etc. Costs for customers in similar solutions are known	3

Business- and client-centricity

Businesses and clients must see the added value of the RTE initiative to use or apply its functionalities in practice. Therefore, the initiative should also be evaluated from the perspective of not only whether it can or cannot increase the profitability of businesses or reduce waiting times for other clients but also of how easily it may be employed, how user-friendly it is, what other benefits (e.g., risk reduction) can it offer. Below are the criteria for the business- and client-centricity dimensions of the RTE validation model:

Criteria	Criteria evaluation statements	Weight of the criteria
Accessibility	It is easy for customers to start using the solution Innovation requires/does not require other software/technologies	5
Benefits for using the innovation	Innovation provides concrete benefits to businesses or clients	4
User guidance	Innovation is user-friendly	4
Risk/error reduction	Innovation reduces the risk of user errors, especially associated with documentation (invoices, receipts etc.)	3
Fraud reduction	Innovation could help clients to detect fraud/reduce fraud potential	3
Collection of user feedback	Innovation users could easily provide feedback on the solution Innovation can be adjusted according to user feedback	2

Environmental

One of the RTE goals is to support the development of sustainable business models and reduce the use of non-renewable resources, such as paper or water. Thus, to qualify as a beneficial RTE project, the initiatives should assist in reaching the above-mentioned goal. Here are the criteria for the environmental dimension:

Criteria	Criteria evaluation statements	Weight of the criteria
Greenhouse gas emission reduction	Innovation reduces emitted greenhouse gases equivalent through reducing paper consumption, water consumption, fuel consumption etc.	4
Paper garbage reduction	Innovation helps reduce visible paper garbage (invoices, receipts etc.)	3
Energy efficiency	Innovation promotes energy efficiency	3
Logistics waste reduction	Innovation reduces overall waste originating from insufficient logistic processes (innovation leads to lesser inventory space used, less leftover through more accurate inventory management, better-optimised supply chains etc.)	3

Future potential

As the last category, we assess if **the target idea/innovation has the potential for future development**. To fully maximise its further potential, the idea should regularly be assessed with the model. Here are the criteria for assessing innovation's future after all the other criteria have been assessed:

Criteria	Criteria evaluation statements	Weight of the criteria
Changes in the legal framework	Innovation can be prepared for changes in legislation	4
Investments related to the innovation	Investments related to the innovation can be analysed (based on current and future costs, discount rates etc.)	4
Financial analysis of the innovation	Innovation can be assessed with financial analysis methods (predictions, cash flows, payback time etc.)	4

Final score and assessment

Now that the criteria and scoring are presented for assessment, the final score is to be calculated and compared to a threshold table to assess if the innovation supports RTE development and is worth implementing. The maximum score for an innovation according to the criteria weights is 665. Below we present a table that helps to check the meaning of the score from the criteria assessment:

Final score	Score explanation
Under 300	Innovation does not support RTE development goals in the BSR and it is not compliant with the presented criteria.
300 - 400	Innovation has some potential to support RTE development in the BSR region and is somewhat compliant with the presented criteria.
400 - 500	Innovation supports RTE development in the BSR and is compliant with the criteria.

Final score	Score explanation
500 - 600	Innovation strongly supports RTE development goals in the BSR region and is strongly compliant with the criteria.
Over 600	Innovation completely supports RTE development goals in the BSR region and is fully compliant with the presented criteria.

Assessment template

The table below works as a template for final scoring. Like the example presented earlier in the report, all criteria can be assessed similarly with the template below.

No.	Dimension	Criteria	Weight	Score	Criteria score (Weight * Score)	Criteria explanation
1	**Technological**	Interoperability (incl. API)	5			• Idea/Innovation is dependent on one specific service • Innovation can be made compatible with existing systems • Innovation is compatible with widely used standards • Innovation systems can connect and communicate with other systems/processes already in place • There are barriers limiting this innovation
		Security	5			• Innovation follows data preservation and portability principles • Solution is overall safe from the technological perspective
		Scalability	5			• Innovation can handle national/regional traffic loads • Innovation has an existing strategy to cope with a growing user base
		Automation	4			• Processes on the initiative are automated • Innovation does not require human interference to work

No.	Dimension	Criteria	Weight	Score	Criteria score (Weight * Score)	Criteria explanation
						• Innovation can exchange data in or near real-time
		Machine-readability	4			• Data in the innovation is machine readable • Data in the innovation can be seamlessly processed by computer
		Extendibility	3			• It is possible to add new functionalities or requirements to the innovation without needing to rework core modules
		Standardisation	3			• Innovation increases the level of standardisation in the area it is applicable
		Innovation	2			• Innovation improves existing technologies • New technologies require the implementation of the initiative
		Maturity	1			• Innovation has been tried in the real environment • Time needed to reach the production stage is known
2	**Strategic**	RTE vision and roadmap alignment	5			• It is aligned with a long-term RTE vision and roadmap • Innovation fits into existing and planned initiatives
		Regional relevance	5			• Innovation is applicable across BSR instead of one country • Innovation matches with BSR countries' RTE priorities
		Implementation duration	4			• Innovation's implementation duration is known

No.	Dimension	Criteria	Weight	Score	Criteria score (Weight * Score)	Criteria explanation
						• It is known if innovation is implemented in phases or all at once
		Systems adoption	3			• Innovation can foster the adoption of other RTE systems • Innovation can serve as a basis for the development of other more specific systems
		Resources of national authorities needed	2			• Innovation requires resources from national authorities
		Transparency and trust	2			• Innovation increases society's transparency • Innovation increases the manual input needed which allows for increased trust
3	**Legal**	Legal compatibility	5			• Innovation is compatible with the existing legal landscape within the BSR countries, or they have mapped the regulations that need to be changed in order to implement the solution
		Data privacy standards compatibility	5			• Innovation is aligned with the data privacy standards within different BSR region countries • Innovation is GDPR compliant
		Information security standards compatibility	5			• Innovation is aligned with information security standards within different BSR region countries
4	**Cost-benefit**	Implementation cost	5			• Costs for the implementation are known • Costs of similar existing solutions are known
		Time savings	4			• Innovation creates time savings

No.	Dimension	Criteria	Weight	Score	Criteria score (Weight * Score)	Criteria explanation
						• Innovation creates material savings
		Resource savings	4			• Maintenance costs in the innovation are known • Maintenance costs of similar solutions are known
		Maintenance cost	3			• Costs for customers (consumers or other businesses) are known, such as transition costs, software costs etc. • Costs for customers in similar solutions are known
		Price/costs for businesses	3			• Costs for the implementation are known • Costs of similar existing solutions are known
5	**Environmental**	Greenhouse gas emissions reduction	4			• Innovation would reduce emitted greenhouse gases equivalent through reducing paper consumption, water consumption, fuel consumption etc.
		Paper garbage reduction	3			• Innovation helps reduce visible paper garbage (invoices, receipts etc.)
		Energy efficiency	3			• Innovation promotes energy efficiency
		Logistics waste reduction	3			• Innovation reduces overall waste through more efficient logistics (more accurate inventory management, supply chain savings etc,)
6	**Business- and client-centricity**	Accessibility	5			• It is easy for customers to start using the solution • Innovation requires/does not

No.	Dimension	Criteria	Weight	Score	Criteria score (Weight * Score)	Criteria explanation
						require other software/technologies
		Benefits for using the innovation	4			• Innovation provides concrete benefits to businesses or clients
		User guidance	4			• Innovation is user-friendly
		Risk/error reduction	3			• Innovation reduces the risk of user errors, especially associated with documentation (invoices, receipts etc.)
		Fraud reduction	3			• Innovation could help clients to detect fraud/reduce fraud potential
		Collection of user feedback	2			• Innovation users could easily provide feedback on the solution • Innovation can be adjusted according to user feedback
7	**Future potential**	Changes in the legal framework	4			• Innovation can be prepared for changes in legislation
		Investments related to the innovation	4			• Investments related to the innovation can be analysed (based on current and future costs, discount rates etc.)
		Financial analysis of the innovation	4			• Innovation can be assessed with financial analysis methods (predictions, cash flows, payback time etc.)

Annexes

Annex I. PowerPoint presentation with main key takeaways and outcomes on the RTE validation model

Summary

- The validation model process helps to identify any potential issues or problems within the solution before the solution goes live.
- The model helps to ensure the **accuracy and reliability of the solution** and **avoid the major pitfalls** during the solution piloting and further development.
- Implementing RTE solution without proper modelling could lead to the realisation of financial and operational risks.
- The validation model is divided into two steps:
  - assessment if the solution is **in the RTE scope or not**,
  - assessing compliance with the **validation criteria**, and

Background

Why is there a need for RTE validation model? Are there any risks of failing to have validation model?

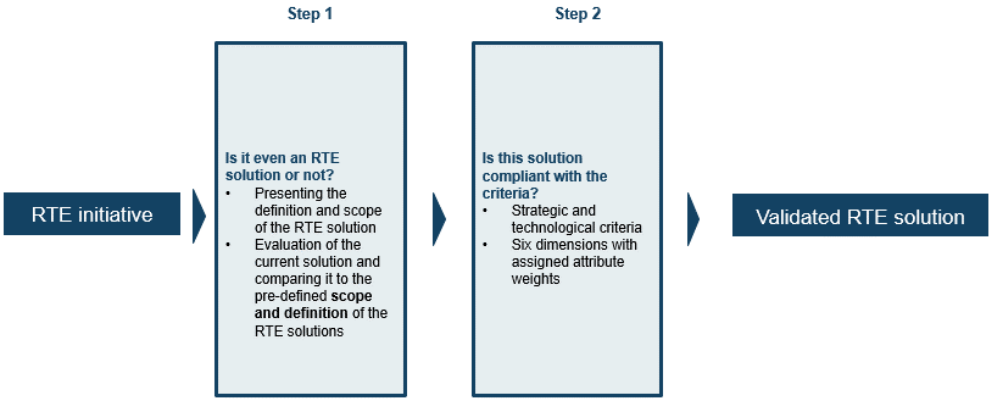
- The usage of validation model in RTE implementation helps to ensure the **accuracy and reliability** of the solution.
- An implementation without functional validation model can lead to, for example, **increasing process costs, mandatory failure compensation of disruptions** to business.
- The validation process helps to identify any **potential problems** with the solution before it goes live.

RTE validation model – objectives and assessment team

- The objective for the RTE validation model is **to make RTE implementation for different end users stable and standardised** due in light of the complicated nature of the concept.
- The validation model should describe relevant principles of Real-Time Economy implementation, such as **standardisation**, use of only **machine-readable data**, **common semantics**, and **transport layer.**
- The validation model is divided into six dimensions covering the key elements of RTE. The dimensions are **technological, strategic, legal, cost-benefit, environmental and business- and client-centricity**. Each dimension will be defined by a specific set of criteria.
- The assessment team should be formed of **legal, technological, financial, and environmental** experts.
- **Each member's skillset should be assessed individually** to see if it matches the RTE implementation recruitments.

RTE validation: process steps

1. Analyse if the solution that model is applied to **is in the scope of Real-Time Economy development** or not.
2. Assess the solution based on **different criteria** to make the implementation effective on various dimensions.



Step 1 – Is it even RTE solution or not?

> **Real-Time Economy refers to a fully automated digital economic system where information about invoicing, receipts, reporting, and taxation is transferred in real time between different operators in the system.**

- When evaluating if a solution is RTE solution or not, the definition and scope of RTE should be observed and compared into the solution assessed.
- The fundamental attributes of the RTE solutions are a complete automation of economic processes in real time between different operators, standardised and in-line encoding and reporting among the operators, and seamless usage of public and private sector information from several sources.
- We should consider these attributes when assessing the potential of the RTE solutions.

Step 2 - RTE validation criteria – dimensions

We consider seven main dimensions for the assessment:

- Technological
- Strategic
- Legal
- Cost-benefit
- Environmental
- Business- and client-centricity
- Future potential

Annex II. RTE validation model: a summary table

No	Dimensions	Criteria	Importance	Criteria explanation
1	**Technological**	Interoperability (incl. API)	5	Is the solution dependent on one specific service/standard? Can it be made compatible with existing systems? Is it compatible with widely used standards? Do the system/processes connect and can communicate with other systems/processes already in place? Are there any barriers limiting this feature? If so, how difficult is it to overcome it?
		Security	5	Which data preservation and portability principles are followed? Is it safe from a technological perspective?
		Scalability	5	Can it handle national/regional traffic loads? What is the strategy to cope with a growing user base?
		Automation	4	Are the processes of the initiative automated? Will it ensure no human interference? Will it be able to exchange data in or near real-time?
		Machine-readable	4	Will the data/information used by the initiative be in a machine-readable format to ensure that it can be processed by a computer?
		Extendibility	3	Is it possible to add new functionalities/requirements without needing to rework core modules?

No	Dimensions	Criteria	Importance	Criteria explanation
		Standardisation	3	Does the initiative increase the level of standardisation in the area/process it is applicable?
		Innovation	2	Is it improving the existing technologies/solutions? Will new technologies be required to implement/use the initiative?
		Maturity	1	Has it been tried in a real environment? How much time and effort are needed to reach the production stage?
2	**Strategic**	RTE vision and roadmap alignment	5	Is it aligned with the long-term RTE vision and roadmap? Does it fit into existing and planned initiatives?
		Regional relevance	5	Is it applicable across BSR instead of just one country? How well does the initiative match BSR countries' priorities in RTE?
		Implementation duration	4	How long will it take to implement the initiative? Will the functionalities become operational in phases or all at once?
		Systems adoption	3	Could it foster the adoption of other RTE systems? Could it serve as a basis for the development of other more specific systems?
		Resources of national authorities needed	2	What resources/support would be required from national authorities (such as new or amended legislation, dedicated teams, time, etc.)?
		Transparency and trust	2	Does it open more information to the society which would increase transparency? Does it decrease the amount of manual input needed which would allow to increase trust?
3	**Legal**	Legal compatibility	5	Is it compatible with the existing legal landscape within the BSR countries? Could it be adopted without major legislative overhauls?
		Data privacy standards compatibility	5	Is the initiative aligned with the data privacy standards within different BSR region countries? Is it GDPR compliant?
		Information security standards compatibility	5	Is the initiative aligned with the information security standards within different BSR region countries?
4	**Cost-benefit**	Implementation cost	5	How much would it cost to implement? What are the potential costs compared to similar existing solutions?
		Time savings	4	Would the initiative increase time savings? What possible monetary value would it provide?
		Resource savings	4	Would the initiative increase resource savings (such as paper)? What possible monetary value would it provide?

No	Dimensions	Criteria	Importance	Criteria explanation
		Maintenance cost	3	How much would it cost to maintain the implemented initiative (monthly/yearly)?
		Price/costs for businesses	3	How much would it cost for businesses to start using the implemented initiative (incl. possible transition costs, specific software costs (if any), etc.)?
5	**Environmental**	CO2 emissions reduction	3	Would it reduce the emitted CO2 equivalent (incl. paper consumption, water consumption and possible fuel consumption)?
6	**Business- and client-centricity**	Accessibility	5	How accessible is the implemented initiative? Would it be easy for businesses to start using it? Does it require any specific software/technologies?
		Benefits for using the innovation	4	What benefits does the initiative bring from the perspective of businesses or clients (such as increased profitability, productivity, etc.)?
		User guidance	4	Is the implemented initiative user-friendly and clear to use?
		Risk/error reduction	3	Would the initiative help reduce risks/errors, especially associated with documentation (such as incorrect invoices prepared/sent)?
		Fraud reduction	3	Would the initiative help businesses or clients reduce fraud potential? From within the company, clients/customers, partners or other third parties?
		Collection of user feedback	2	How easily can the feedback from users be provided? Is the implemented initiative adjustable as per the received user feedback?
7	**Future potential**	Changes in the legal framework	4	Innovation can be prepared for changes in legislation
		Investments related to the innovation	4	Investments related to the innovation can be analysed (based on current and future costs, discount rates etc.)
		Financial analysis of the innovation	4	Innovation can be assessed with financial analysis methods (predictions, cash flows, payback time etc.)