Roadmap for Real Time Economy and MyData for Europe
Discussion paper

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1. Overview

Real Time Economy for Europe is a vision materialized through applications using the collection of interacting ecosystems needed to deliver data based new services and increase productivity in the financial administration area. Progress here will speed up the development for a data driven and Artificial Intelligence (AI) supported much wider MyData for Europe named phase. The Payment Service Directive (PSD2) model and General Data Protection Regulation (GDPR) now provide strong incentives for this development.

The vision for the EU and national end-goals are gaining visibility, but too much of the actual work being done is either on a very high level or hidden in silos that do not benefit from each other’s innovations or do not have open standardised interfaces.

To improve the situation, it is necessary to get a clearer and shared vision both in Member States and the Commission and based on this to decide for determined implementation by setting up local and central RTE and MyData bodies steering the development and furthering interconnection of both existing services and ongoing projects and pilots. If this is not done, national solutions will not aim at serving Europe, standards for interoperability will not materialize, double work will be done and the best ideas will not flow fast enough. The Single Market will stagnate on lower levels.

The Nordic-Baltic area has the capability to act as a “laboratory” for EU as many of the needed infrastructure, ecosystems and services are already in use, several programs for the next phases are up and running and the countries are small enough to get the many needed public and private sector stakeholders around the tables. Similarity in legislation and attitudes also make cross-border interconnections easier to achieve.

This white paper is mostly based on experience in Finland and to a lesser degree discussions with the EU commission and neighbouring countries. It is not to be seen as a full description of the present dynamically evolving situation or the “final truth” of future directions, but as a discussion paper with questions to be answered and proposals to be discussed further.
2. Real Time Economy for Europe

2.1 Background

The Real Time Economy (RTE) program was set up in Finland in 2006 by Tieto Plc and Aalto University. It was partly publicly funded and engaged a large number of both public and private sector entities.

In the first phase the focus was on driving Pan-European e-invoicing in parallel with SEPA. The importance of this was based on estimates by the Finnish State Treasury, the Confederation of Finnish Industries and the Association of Finnish Local and Regional Authorities that added up to an annual direct cost saving of 3.1bn€. In relative terms, this would exceed 200bn€/year in EU. Both higher and lower estimates have been made later. Direct and indirect productivity aspects of the RTE at large are discussed further in Annex I.

The scope of the program was later extended to automating real time data access and processing in the financial administration area at large. Examples of this are e-receipts, automated accounting, salary administration and tax reporting (Annex II).

The RTE program was followed by TARU program in 2013 (led by Tieto), the Taltio program in 2015 (led by the Association of Finnish Accounting Firms), and the RTeco program (led by Technology Industries in Finland) in 2018. Updated information can be retrieved from http://rte.fi/borderless/.

2.2 RTE Definition

The Real Time Economy is an environment where financial and administrative transactions connecting citizens, business and public sector entities are:

(i) in structured standardized digital form
(ii) increasingly generated automatically, and
(iii) completed increasingly in real time without store-and-forward processes.

The data connected - and the powers to use it - are treated as private and corporate MyData and governed by GDPR as applicable. Data is made available to authorized parties – increasingly data operators - through standardized interfaces.
2.3 RTE Mission – the Why

The mission of the Real Time Economy program for Europe is to - on a substantial scale:

1. Improve productivity through direct cost savings especially in SMEs and the public sector
2. Make indirect productivity improvement and dynamic impact visible
3. Increase utilization and verification of data to improve especially context-specific services
4. Enable new levels of harmonization in the EU Single Market
5. Create processes that lower the CO2 emissions
6. Promote transparency and create cost-efficient solutions against tax evasion

The main issue for Europe is to improve productivity and service levels in order to be competitive in a global market - in face of its shrinking workforce. As resources and attention are in short supply it is necessary to prioritize projects.

For prioritization it is important to evaluate the economic direct and separately the indirect economic and other impact. To make the net impact transparent, it is necessary to divide the estimates for needed investments and benefits separately for enterprises, the public sector and the households (that eventually reap most of the benefits in form of better and less costly services and lower taxes).

The RTE contribution for better productivity and other benefits is described on a high level - in Annex II.

It is obvious that RTE ecosystems stand out compared to other initiatives - not only for the direct and indirect economic impact - but also because investments needed are small and progress can be fast - if there is the political will.

2.4 RTE Vision – the What

Data needed for automated financial administration, public sector reporting, financing and other user contexts will be available in real time in standardized forms for data owners, their authorised users and the public sector in harmonized processes across the Single Market.
2.5 RTE How - strategic steps in first layer

Even if the mission and the vision are getting clearer, there is still a monumental task to:

1. Get the determined decisions in place both in Member States and EU
2. Communicate the overall vision, the goals and the progress widely
3. Create the needed EU-wide ecosystems
4. Build the interacting services
5. Replace legislation that slows down progress with change driving programmes and regulation

It is inevitable that Member States (MS) will make progress with own timetables and that many solutions will initially be MS-specific. The task is rather to speed up what is going on and try to feed in ideas and practises from other MSs and from all sectors – than try to force all into one model. The concrete progress can only happen locally – where most of the direct benefits are - but there are still areas where the European Council and the European Parliament should decide for stricter harmonization. The most important task is to support and connect development work and their pilots into intensive iteration – to improve the common roadmap. At present the RTE mission, vision and tasks can be described on a high level in this picture:
2.5.1. e-Invoicing

E-invoicing leads to very large direct cost savings - especially at the buyer’s end - as it enables automation of approval and payment processes. Cost savings through sending e-invoices is lower, but still significant.

To this should be added that e-invoice based payments are received earlier (saving financing costs) and can – being cost-efficient especially for the receiver - be sent more frequently and thus cut credit and foreign exchange risks for the sender.

Follow-on savings from automated accounting, VAT and other reporting are also very large. These all taken together – and very large indirect productivity improvements outlined in Annex I give the invoice receivers the right to demand e-invoices and for the public sector to make it mandatory.

The steps needed for full migration to e-Invoicing are:
1. Decide nationally and make case made clear for all stakeholders
2. Choose standard that has the data fields needed for automated accounting, reporting and analysis. EU semantic standard should be starting point.
3. Make sure that service providers compete in 4-corner model (sign up with one service provider and reach/be reached by all invoice receivers and senders) with easy to use and low cost (payment automation supporting) real time alternatives also for microenterprises.
4. Aim at same solution for b2b, b2g, b2c, g2c, c2b and c2c.
5. Make e-Invoices mandatory in public sector.
6. Make e-invoices mandatory in b2b.
7. Charge for paper invoices in b2c and g2c.

Questions:

1. What holds back mandatory e-Invoicing for the public sector in Member States?
2. When can all organisation-to-organisation e-Invoicing be made mandatory? What holds it back?
3. How soon can e-Invoices be forwarded in real time?
4. Would it be possible to integrate SEPA direct debit into e-Invoicing?
5. How much would a common EU or global format standard add?
6. Should interoperability x-Europe be enhanced by upgrading from 4-corner-model to a shared distributed infrastructure? See picture below.
7. Should the Nordic-Baltic MSs act as laboratories also for distributed networks for e-invoicing?

2.5.2. e-Receipt

Migration to structured e-Receipt was a target already in the RTE/TARU phase and gathered more weight when the Association of Finnish Accounting Firms was in charge of the RTE/Taltio phase as corporate card usage create much manual work in accounting (Annex I).

The specification work for a 4-corner based ecosystem using the same standard (Finvoice) as for e-Invoicing has been completed in Finland.

The ongoing RTeco program’s main focus is on activating more service providers and getting merchants and enterprises signed up. Receipts for consumers will be in the focus in the next phase.

The steps needed for full migration to e-Receipts are:

1. Decide nationally and make case clear to all stakeholders
2. Choose standard that has the data fields needed for accounting, reporting, sustainability and analysis. EU semantic standard should be starting point.
3. Agree on model where the buyer can specify the e-Address to which receipts (payment type agnostic) should be sent – eliminating the need to enter any information at the sales point.

4. Make sure that service providers compete in 4-corner model – sign up with one service provider and get receipts sent to all buyers or their designated accounting services in real time.

5. Make mandatory in public sector.

6. Make mandatory in b2b.

7. Use of e-Receipt as communication seller-buyer communication channel (warranties, service calls, recalls etc.).

Questions:

1. What holds back mandatory e-Receipt for the public sector in Member States?
2. When can all organisation-to-organisation e-Receipt be made mandatory? What holds it back?
3. The card payment e-Receipt can be sent to the buyer specified e-Address (accounting for enterprises and expenses tracking application for private customer). How should cash and bank account payment receipts be handled equally?
4. When can piloting for e-Receipt as Seller-Buyer communication start?
5. How much would a common EU or global format standard add?
6. Should interoperability x-Europe be enhanced by upgrading from 4-corner-model to a shared distributed infrastructure?
7. Should the Nordic-Baltic MSs act as laboratories also for distributed networks for e-receipt?

2.5.3 Real Time Payments

The European Central Bank and the European Payments Council are driving Pan-European instant payments and this should be a central part of automation and risk mitigation of commercial and administrative processes. Person-to-person payments in Sweden (Swisch) and in Finland (Siirto and MobilePay) are handled in Real Time across banks. These can also be used for web shop and in-store payments and should also provide structured standardised e-Receipts. Instant payments are central elements for real time accounting, VAT-reporting and automated expense follow-up – but productivity estimates are not at hand.
Questions:

1. How has economic impact for enterprises, households and the public sector been quantified? What is the overall impact on productivity?
2. When and how can e-Receipts be widely included in e-commerce and in-store payments?

2.5.4 e-Procurement

e-Procurement is recognised as one of the key drivers towards the implementation of the once-only principle in public administration.

Service providers should create simple tools for the SME-sector for responding to RFPs, making offers and receiving orders. The **same tools should be used both in the public and private sector**.
Benefits include improved competitiveness for SMEs, better productivity, contribution to automation of cash flow forecasts and better financing.

Questions:

1. How soon can a SME-tool piloting start?
2. Can the e-Invoicing messaging ecosystem and e-Addresses be used?
3. Which large-corporate sectors stand to benefit most from more efficient SME-sub suppliers and widely used procurement solutions?

2.5.5 Real Time e-Salary

e-Salary services were developed in Finland in the 90s. The solution links the salary statements to the salary payment in the employees bank account.

The next steps include automation of reporting and payments to tax, pension and insurance systems.

Questions:

1. How soon will pension payments be included?
2. What is the interest for e-Salary in other Member States?
3. How should MyEarnings Data and pension information be developed further?

2.5.6 e-Address

e-Addresses are a central element in the e-Invoicing ecosystem where they route the invoice to approval and payment automation. For e-receipts e-Addresses are needed to route the receipt to accounting for enterprises or to expense follow-up for private users.

As e-Invoices and e-Receipts need to be traceable in transaction logs, all messages sent in this ecosystem to e-Addresses could be treated as recommended e-letters.

Questions:

1. Should there be one e-Address ecosystem for all documents?
2. Should the system be centralized or decentralized?
3. How much can be gained by using e-Invoicing/e-Receipt ecosystem and e-Addresses for all documents and recommended e-Letters.
4. Should the Nordic-Baltic MSs act as laboratories also for distributed networks for e-Address?

2.5.7 e-ID and e-Signing

E-id services were introduced by banks in the 90s in Finland. Anti-money laundering legislation forces banks to strictly control account opening and this was seen as a strong base. Bank and other e-ID services was later supported in additional legislation.

The service became very popular as banks are trusted and can offer frequently used and thus familiar tools. In 2017 the number of id-transactions is estimated to have exceeded 100 million. The public sector is a major customer. Also other Nordic countries have used banks for this.

Bank e-ID codes and tools are widely used for signing loan agreements and also for signing documents between third parties, but these volumes are still rather low.
Lately also tele operators have started to offer e-id services. The state issued card is not used much. Estonia has successfully implemented an e-ID card system.

e-ID is now getting into new focus as the data driven economy and legislation underlines the need for trust in verification, data ownership and empowerment. Internet was not build with trusted interactions in mind - so new solutions are needed - to verify data, its ownership and the right to use it – all in real time.

Questions:

1. What upgrades should be made to the services?
2. How much and how soon will decentralised global identity networks like Sovrin [https://sovrin.org] change the situation?
3. What are the obstacles for making e-Signing of documents a default?
4. What remains to be done in eIDAS?

2.5.8 Digitalise unlisted shares

Stock exchange listed shares, most traded bonds and a small part of unlisted shares are digitally stored in central security depository systems (CSD). This makes the data golden source (verified ownership) and enables payment against delivery and pledging.

If all shares would be registered similarly, ownership changes would be easier, transparency (beneficial ownership, anti-money laundering) improved and accounting and financing automation enhanced.

The growth of start-up companies and the trend also otherwise to have employees as shareholders also call for automated ways to report ownership and make transactions easier.

Questions:

1. Can CSDs be used for all unlisted shares?
2. How soon can distributed ledger technology be introduced and produce the same golden source level as CSDs do today?
3. When can digitalisation and registering be made mandatory?
2.6 RTE How – Next layer enabled

The “first layer” ecosystems (described under 2.5) create ecosystems to improve services, save costs, furthers sustainability, transparency and Single Market development on a grand scale on their own. Progress in one system often enables progress in other.

But they are above all “staircases” to the next layer of services described below.

2.6.1. Automated accounting

The RTE-program set automated real time accounting as a goal at an early stage. At the first stage a unified reporting code – needed mainly for public sector reporting - was designed. In the next phase the focus was moved to TALTIO - the Finnish implementation of the Extended Business Reporting Language (XBRL) Global Ledger (open standard for transactional reporting, providing a generic and system-independent way to record all of the details - in any kind of ledger) PSD2 was the first large scale move to make data available in standardized ways to users in EU. Starting from MyData in transaction accounts could also be seen as a follow-on step from SEPA.

This thinking also inspired the RTE-program to aim at the same model for data needed for accounting and reporting. The TALTIO phase created a model and proof of concept for repositories for data needed for applications for profit and loss (P/L) and Balance Sheet statements where accounting data is stored in XBRL format and with standardised interfaces.

Further work has been done in the public-sector steered Nordic Smart Government initiative. Steps to fully achieve automation include:

1. Migration to structured e-Invoicing
2. Migration to structured e-Receipts
3. ISO 20022 account statements
4. Real Time Payments
5. Digitalisation of ownership data
6. Standards for and open access to accounting data
Questions:

1. When will EU mandate XBRL?
2. Will Estonia join the next phase of Nordic Smart government?
3. How soon will accounting companies be ready to use standard data models for customer’s MyData – enabling access for the customer’s choice of application?
4. Can the applications for automated micro-enterprise accounting be reused for private expense follow-up?

2.6.2. Real Time Assets

A widest possible and real time access to verifiable asset data is needed for transparency in general and efficiency in ownership changes, accounting, wealth management, financing and taxation.

Digitalization of all shares and real estate ownership can be seen as first steps. It is also evident that Internet of Things (IoT) and other development will lead to e-Labelling of both physical and other wide asset classes furthering automation of inventory management and through this accounting and procurement processes at large.

Real Time liabilities will be available from real time accounting and positive debt registers.

Questions:

1. How soon will land register and housing estate information be available as MyData?
2. Will factoring companies drive the inclusion of e-Labelling?

2.6.3. Real Time Income Register

The national income register was shortlisted in the Real Time Economy program. The target in the now ongoing Tax driven project is that all salary (later also pension) payments automatically will be reported to a central register – serving real time taxation rates and social security evaluation.
The MyData created here should be made available also when applying for loans. The cost saving potential for the entire renovation of salary administration in Finland has been considered to be substantial (Annex I).

Questions:

1. How wide is the interest for real time income registers in other MSs?
2. How can this be combined with positive credit registers?

2.6.4 Automated reporting

VAT reporting is to a large degree a manual process that causes high costs both in enterprises and accounting firms (Exhibit I).

With automated data extraction from e-Invoices, e-Receipts and automated accounting this should be automated as soon as possible.

Other benefits include more cost-efficient and efficient anti-grey economy measures and opportunity to collect line-specific purchase big data for economic forecasting.

2.6.5 Automated finance and risk evaluation processes

Financial data is needed for loan applications and when it is in structured form, verified and real time updated its information value and automation effect is very large. Further cost and time saving will be gained by wider use of e-signing of loan agreements and pledges.

Credit losses will be lower and this will also lead to lower risk margins and over time to lower capital requirements in banks.

This development will also further open up the financing market to new entrants and crowd funding. Automated risk evaluation connected to accounting and ownership verified data can recommend the right type mix of financial instruments – beneficial for both the enterprise and investors.
Financial covenant monitoring can be connected to real time accounting, ownership changes and eventually even inventories. This lowers further both risks and administrative costs for both sides. Dynamic pricing would be a further logical step. Financing increasingly need public or private classification information and adherence to Corporate Social Responsibility. Data service providers could be empowered access these MyData sources on behalf of the applicant.

The next level will be inclusion of non-financial data – for example customers’ ranking of loan applicant’s service levels.

Steps to fully achieve automation include:

1. Automated real time accounting
2. Automated real time ownership data (shares and real estate)
3. Automated real time cash flow estimates (connected to e-Procurement)
4. Standardised access to a wide range of risk-relevant or regulation required data
5. Automated real time national income registers
6. e-Signing of loan and pledge agreements

Question:

1. The productivity improvements achieved by automation, expanded financing and smaller credit losses are obviously very large. How large?

2.6.6 Comprehensive asset reporting

Present wealth reporting is covering only a small part of assets as it includes mostly only listed shares, bonds, bank managed funds and account balances – in the bank in question.

The biggest asset classes – homes and real estate are not included. The growing ownership in unlisted shares both generally and in start-ups especially obviously also calls for action.

Questions:

1. How soon will land register and housing estate information be available as MyData?
2. Are wealth management actors to let customers MyData through standardised interfaces to credit applications and competitors?

2.6.7. Real time economy forecasting

It has been envisaged that real time VAT-reporting with line specific data could be used for e-Forecasting of local, national and EU-economies.

This would mean that EAN-code specific line data from e-Invoices and especially e-receipts could be combined to give a real time picture of purchases and compare this to previous day and longer periods.

The information would be available per item and its cost, per type of seller, per national region, per country, per EU, per type of buyer and how this correlates to external factors like salary development, economy news, changes in tax, stock exchange development, interest rates, sentiment news, product publicity and advertising – even the weather.

Knowing where the economy – and tax revenue - is going in real time could be a side effect of real time VAT-reporting. Of course this should and can be done in such a way that it does not hurt private corporate data.

Compared to traditional questionnaires this would be more than a sentiment or opinion as citizens are “voting with their wallets”.

2.6.8 Real Time Taxation

The national income register project (https://www.vero.fi/en/incomes-register/) was as a starting point aiming primarily at cutting the administrative burden in enterprises, accounting firms and the public sector. But it will also lead to an opportunity to automatically adjust tax rates to automatically reported payment specific payments.

This will largely eliminate the surprises delivered by back taxes and improve cash management for citizens and also increase revenue predictability both on state and municipality levels.
A seamless interaction between salary administration systems, tax authorities and pension systems is needed.

3. MyData for Europe

3.1. MyData background

The first MyData Conference was held in Helsinki in 2016. As a result, the MyData Global Network was launched in March 2017. There are now 65 founding members in this network acting as ambassadors for the MyData movement around the world. It is currently administrated by Open Knowledge Finland and Aalto University. The next conference will be organized in Helsinki in August 2018, more info can be retrieved from https://mydata2018.org.

3.2 MyData definition and principles

MyData is a human centred approach in personal data management that combines industry need to data with digital human rights. MyData is both an alternative vision and guiding technical principles for how we, as individuals, can have more control over the data trails we leave behind us in our everyday actions.

MyData principles:

3.3. MyData for Europe

GDPR is giving strong support to the MyData services development approach and is thus one cornerstone for the Single Market data-driven economy. Other cornerstones include AI-driven service design, PSD2 model for all data availability and Block Chain based solutions.

The RTE ecosystems produce both central MyData elements in structured form and tools needed and can thus substantially add speed and depth to service development in all sectors – and themselves benefit from the growing usage.
In 2017, it became clear that connecting ongoing RTE ecosystem development with the MyData approach and Block Chain technology is the right way forward.

3.3.1 Why – the Mission

The mission for the MyData for the envisaged Europe program is to on a substantial scale:

1. Improve the EU citizen’s control of her/his data
2. Create solutions where the citizen can empower service providers to – x-Europe - collect and deliver data needed in different contexts
3. Increase productivity in enterprises and the public sector
4. Enable new levels of harmonization in the EU Single Market
5. Create processes that lower the CO2 emissions

In short: to radically improve data-driven services and competiveness in the Single European market and protect digital human rights.

3.3.2. What – the Vision

MyData for Europe has enabled a single European data-driven service market by creating models leading to practical interoperable solutions for how EU-citizens, enterprises and their authorised service providers can gather, verify and protect privacy for data needed in wide range of contexts.

3.3.3  How

3.3.3.1. Make the path clear

For quite some time it has been clear that data is the “new oil” and trust the “new currency” in the economy. The opportunities to improve service and productivity by this and new levels of AI are immense. But how the next phase should play out concretely and how soon has to many been shrouded in mystery – much because the Block Chain technology needed is difficult to comprehend and as there still are open both ethical, legal and technical questions. Well illustrated in educative this US Congressional hearing: https://www.youtube.com/watch?v=VptsprY6qPI&feature=youtu.be.
A clear path to how MyData will deliver better everyday services is however emerging. The Why is clear. As information and technology overflow has shortened attention span - a good service must address the customer’s contexts in a comprehensive, automated and anticipating ways.

As services experience is obtained from the globally best, customers will expect the same also from the local – and if they do not deliver - reactions are to be expected from the growing impatient part of the audience.

Earlier attempts to solve this were often titled personalisation but were typically limited to information that could be gathered inside organisations and as this did not address the needs fully and technology was not available to reach outside data silos progress was limited. Block Chain, open source Hyperledger Indy and Sovrin now hold strong promise that x-organisation and borderless access can materialize.

A simple description:

1. The EU citizen - (in private of employee role) is heading for a context - next life event (new job, buy property, apply for financing, go to the doctor, invest, establish enterprise, enter new market etc.)
2. A chosen data-service provider (DSP) has predesigned the “data basket” needed for this. AI will dynamically add and delete elements to/from the basket. Structured RTE data is often included.
3. The citizen empowers the DSP with e-ID tool to approach relevant data storages (in public and private sectors) with the citizen’s request (“can opener”). Verified data is central, but also self-claims and other softer data can be collected.
4. The data basket for addressing the needs in the life event is delivered. It can also include verified information on a citizen’s power to act on behalf of others (parents, children, employer, enterprises, organisations etc.).
3.3.3.2. National and EU decisions

National determined decision should be made to:

1. Promote the MyData approach for service development
2. Connect ongoing Real Time Ecosystem programs with MyData efforts
3. Support public-private piloting on a large scale
4. Connect to data needed from other countries
5. Establish a national co-ordinating body
6. Drive establishment of an EU-level MyData steering group

3.3.3.3. Piloting

In parallel with efforts to make MyData the architectural key to EU data-driven services it is of utmost importance to start as many as possible pilot projects and exchange both technical and user experience openly.

Examples of ongoing pilot discussions include data baskets needed for job applications, property transactions, health services, wealth management and financing.

4. Bottlenecks

Migration to automated processes and MyData driven services can also have a negative impact – at least in the short term.

The need for many types of manual routine work will first disappear and with growth in machine learning also more skill-demanding jobs will be eliminated. It is therefore important to educate citizens, so that they understand the inevitability of the development and that new job opportunities will arise. Much more jobs will be lost -and fewer new ones created if a country or Europe at large do not move fast into a more productive digital environment.

This underlines the need to get citizens to understand that the new era demands an active approach to life long learning and to establish a model where schools and workplaces interact closely and use AI-solutions to guide learning on an individual level.
As Esko Kilpi has said old tasks will disappear and new work will be created. But it will not be called work – but “learning together” and this type of teamwork also means a renaissance of humanness. [https://www.sitra.fi/julkaisut/perspectives-new-work/](https://www.sitra.fi/julkaisut/perspectives-new-work/)

Another aspect that still may install fear is the fact that there still are people who are not able to use the smartphones or other tools needed to be reached by and approve MyData-based propositions. Even if the need to enter data will be largely eliminated it may still be necessary to provide human guidance via call centres and outlets for this sector. It is however clear that all enterprises have to use only digital administrative processes in the near future.

Much feared aspects are also weak data security, privacy and general vulnerability of a society where all processes are digital. The positive aspects with the MyData approach and Block Chain are that data here is stored in distributed ledgers in stead of single ones and that the whole concept is built to enhance trust, give citizens control over their data and increase verification of both data and users. This also addresses for its part both standardisation, data quality, one-time insertion of data (TOOP) and technical data exchange issues – but more attention is needed for stricter adherence to rulebooks. Legislation should not be allowed to slow down progress. A common EU map on what remains to be done with proactive regulation would be useful both for member states and the Single Market.

While it is relatively easy to spread ideas across borders, it is not self-evident that time tables and implementations are similar or that projects become joint. MSs have different attitudes, legislation, starting points, standards and legacy solutions already in place. Home market needs and transaction volumes – and thus the business case – are on a different scale compared to x-border needs. Yesterday’s best technology may be close to redundant today.

This means that the roadmap must be local (with as much as possible EU-ingredients) and communicated clearly (as such – not blaming EU for solutions that MS have agreed on) to all enterprises and citizens. Still it is evident that the space for doing together with other member states (Nordic-Baltic laboratory) is growing as standards, legislation, funding and attitudes converge.
In all honesty it should also be said that nobody knows exactly how and when the elements will fall in place. But to protect and create more sustainable prosperity it is necessary for much larger groups of citizens to join the discovery journey. As Yuval Noah Harari writes in his Homo Deus; the speed is increasing, nobody really knows where we are heading and nobody knows where the break pedal is. Some may of course resort to dystopia here – but that is nothing new.

**Will small enterprises have any chance** of competing with larger ones in this new environment - is another question asked. Here it is logical to think that Real Time Economy ecosystem services greatly improve their competitive position. MyData data combined with a multitude of data services providers using AI actually also enhances their service offerings - without a need to employ specialists or invest in IT-systems.

In **mitigating undue fear**, it is very essential that political parties compete in describing the positive factors and actions to mitigate – instead of the risks.

5. **Summary**

This has been a wide sweep - intended to demonstrate how interrelated different ecosystems can and should be in the data-driven economy.

The starting point was the Real Time Economy program - aiming in the first phase squarely at private and public sector cost savings in large volume transactions - and then moving to cost saving in accounting and payroll administration.

Inspired by the open data movement, seeing the PSD2 model in a wider context and GDPR as a necessary and supportive regulation, it was natural to connect to the MyData work.

In the **Borderless Real-Time Economy Round Table** meeting in Tallinn (February 1-2, 2018) the goal was to share Nordic-Baltic project outcomes and find similar interests going forward. Recommendations from the meeting included:

1. Nordic-Baltic governments and EU should be committed to creating a Real Time Economy. Shared visions and investments in infrastructure
2. Common standards should be a starting point
3. Common objectives – and practical pilot cases (Laboratory for EU) – cross-border taskforces needed (possibly within the PACINNO project)
4. Suitable candidates for joint efforts: e-Receipt, e-Accounting – using Tieto-created POC-tool and joining next phase of Nordic Smart Government (NSG)
5. Make e-Invoicing mandatory
6. Explore road map and pilots for RTE as part of MyData
7. Information is central (also translation to get the wider local understanding and support). Shared webpage needed for x-border information: http://rte.fi/borderless/

Central questions to be asked next include:

1. It is widely understood that the above described thinking and real time, automated, MyData-driven ecosystems will materialize in the future. How could it happen faster?

2. It is obvious that standardization and rulebooks cannot always – in a quarterly economy - be delivered by the market. What kind of steering and financing are needed to get this solved?

3. The technology behind the MyData phase or RTE standardization work are not easy to understand for non-experts. The logic of MyData services is however rather plain to see. Could this part be simplified further and widely communicated?

4. Europe will inevitably progress with different speeds as some Member States need to and can move forward faster. This will lead to both national and temporary solutions. Some of these are friends – other foes. Will EU establish the steering group/observatory that can identify best practises from national pilots and solutions and also understand that on occasions the best is the enemy of the good.

5. It has been seen that vested interests may slow down progress. Even if Open Banking and other initiatives are showing the way, it is still possible that undue delays and expenses will be caused. Is EU equally prepared to handle these ground rules as it has been with SEPA, PSD2 and GDPR?

Additions, corrections, answers, comments and additional questions can improve this discussion document in many ways and in the best case make it a dynamically updatable roadmap to the Real Time MyData driven European Single Market.
Annex I

In order to prioritize RTE-projects it is important to get at least rough estimates (best case/worst case) both for the building blocks. But it is even more important to get an understanding for how services in one ecosystem enable progress in the next layer:

1. the direct costs and benefits of the individual ecosystems and services forming the building blocks – for enterprises, households and the public sector and how these add up
2. the direct benefits the building blocks have on other RTE ecosystems and services – and how this translates to benefits for enterprises, households and the public sector
3. how soon net benefits can be gained (fast and easy first)
4. the indirect benefits for society at large (societal at large, learning, mobility in work force, Single Market, environmental, preventing fraud, rule of law, tax base.)

Many project-specific rough estimates have been made by trustworthy experts, but a smaller number has been officially documented. Results vary – but the usual reaction has been “big enough – let’s get going. Impact studies for the full RTE are not at hand.

I. RTE impact for the EU Citizen
Citizens pay – often through many steps – eventually all the costs of enterprises and the public sector. The very large savings that can be achieved with ecosystems based RTE services can in a competitive market quickly materialize as lower prices and as lower tax pressure.

Impact analysis should also aim at measuring the economic impact of digitalization by setting an hourly cost for time spent on administrative work and cost for related travelling to services in households. The German Federal Normenkontroll Rat has set the average hourly rate to 25€ for citizens in order to have a basis for comparing compliance costs of the citizens.
This logic should not be applied only to compliance – but to all economy related services in RTE (and later the full MyData) driven solutions. The time (and stress) saved for citizens would amount to very large sums.

Connecting automated real time transactions (payments, e-invoicing, e-receipts, e-salary, securities, e-id, e-signatures, etc.) to real time databases for liquidity, assets and liabilities, spending analyses, taxation etc.) will enable direct and indirect benefits on a very large – but so far unquantified scale:

1. Better and simpler management of personal economy based on real time view of financial position and spending analysis
2. Lower financial risk with automated cash flow estimates and better predictability through real time taxation
3. Less administrative work (time spent)
4. Smaller information overflow (stress)
5. Lower service costs (due to automation)
6. Lower tax burden (due to automation)
7. Faster (data available in real time) and cheaper financing (due to automation – and lower credit risks)
8. Better corporate and public sector service based on automated data driven propositions (further gains in full MyData driven phase)
9. Lower fraud risks (fake invoices eliminated, MyData protected and controllable)
10. Lower tax fraud (lower tax burden due to wider tax base)
11. Better services from open competition (4 corner models, PSD2 and MyData drivers) and wider app development
12. Better jobs (more interesting and better paid as routine work is replaced with more value and productivity creating tasks
12. Economy of repetition – learn once – use everywhere - when the familiar tools are the same in private, employee and citizen roles across all public and private services

II. RTE impact for EU enterprises (applies also to public sector entities)

Large enterprises have digitalised substantial parts of their financial and administrative processes – but the potential in the much wider SME sector (99% of
all enterprises, 67% of employment and 53% of gross value added) is mostly untapped. The RTE mission is to radically improve the competitiveness especially of this sector.

1. Lower direct costs of transactions and administrative burden at large.

1.1. E-Invoicing
The starting point in Finland was provided by the Finnish State Treasury, when it estimated that an incoming paper invoice caused a 30€ to process to payment, while a structured e-Invoice cost was 11€ and a fully automated e-Invoice (posted to accounting) would cost 1€. The cost saving potential for the state sector was estimated to 150m€/year. The municipal sector also arrived at 150m€ and the Confederation of Finnish Industries for enterprises part to 2,8bn€ (applying the first stage 19€ saving). Translating this total (incoming b2b and b2g) to EU level (Finland’s GDP 1,4% of EU) would arrive at 220bn€. Billentis has arrived at lower savings figures for incoming invoices (11,20€), while the cost saving by sending e-invoices (not included in the Finnish estimates) is calculated to 6,60€

1.2. E-receipt
The RTE-Taltio project and the Association of Finnish Accounting firms estimated a cost-saving of 6€/receipt adding up to 800m€/year – 57bn€/year on EU-level.

1.3. Real Time Payments
Cost saving estimates not at hand – but clear that the automation and finality aspects save considerably costs.

1.4. e-Procurement
Studies are pointing to 62% reduction in requisition-to-order processing costs.
http://www.industryweek.com/companies-amp-executives/e-procurement-provides-significant-cost-savings: EU has estimated the Peppol project savings to be 50bn€/year.

1.5. e-Salary
The cost savings arise from lower cost for distributing paper statements and from lower support costs. On the other hand, implementation turned out to be low cost in the Finnish case.
1.6. **e-Address.**
Centralised or distributed. Cost savings from not joint investment and management.

1.7. **e-ID and e-signing.**
Significant cost savings as strong ID can be used in all services and one ecosystem can serve all parties (bankID or card based). Significant benefit when the same familiar and trusted tools are used both in private and employee roles.

1.8. **Digitalise unlisted shares.**
Direct cost benefits not at hand. Unofficial cost saving estimates arising from higher efficiency for housing company shares and mortgage lending exceeded 100m€ a year in Finland.

1.9. **Automated accounting.**
Unofficial Cost saving estimates building on e-invoicing exceeded 150m€/year. EU equivalent 11bn€.

1.10. **Real Time Assets.**
Cost efficient support of accounting, credit processes and wealth management.

1.11. **Real time income register.**
Part of overall renovation of salary administration area. Unofficial cost saving estimate exceeds 200m€/year. EU- equivalent 14bn€.

1.12. **Automated reporting.**
Unofficial cost saving estimate for VAT reporting exceeds 350m€/year. EU- equivalent 29bn.

1.13. **Automated finance and risk evaluation.**
These processes are dependent on data from accounting, income and ownership registers. Considerable savings potential.

1.14. **Comprehensive asset reporting.**
Cost savings in banks and asset management services.
2. In addition to benefits from direct cost saving other **indirect productivity improvements** can be of an even bigger magnitude for many enterprises and society.

2.1. **Real time information** on financials and automated forecasts enables efficient cash management and optimisation of financing.

2.2 **Improved and service** to customers and suppliers (saving also their costs)

2.3. **Lower credit risk** (cost efficient e-Invoices allow more frequent invoicing and payments are faster). Lower outstanding receivables also lower **currency and liquidity risks**.

2.4. **Lower fraud risk and prevention costs**. (e-Invoices can only be received from trusted operators).

2.5. **Speed up and lower administrative and risk costs in financing** (the borrower pay all costs).

2.6. **Free up staff from administration to productive work** (very central)

2.7. **Enable digital governance and efficient ownership changes**

2.8. **Open up opportunities for RTE-start-ups**

2.9. **Cut grey economy** (unfair competition)

2.10. **Cut CO2 emissions** (cost-efficiently)

III. **RTE impact for Member States and EU Economy (in addition to direct and indirect cost savings above)**

1. More competitive and more enterprises > wider tax base, more productive jobs
2. Significant boost for the Single Market
3. Better served citizens and enterprises – also x-border
4. Lower costs > lower tax burden > better purchasing power and competitiveness
5. Employees moving to more productive and interesting work > boost for life-long learning.
6. Growth and innovation from digital economy start-ups
7. Smaller carbon footprint

8. Significantly smaller grey economy
9. Real time automated economy and tax revenue forecasts. Line-specific purchase data from e-Invoices and e-Receipts in real time instead of costly and slow questionnaires and polls.
10. Improved transparency (beneficial ownership, financing and payment tracking)
11. Lower credit and fraud risks in banks and enterprises (freeing up capital).
12. Fuller benefits of PSD2 and GDPR

But to gain this it is obvious that Member States and the Commission need to:
- make the roadmap clear,
- take determined decisions,
- provide support for ecosystem an infrastructure work,
- act as a model user,
- provide incentives for enterprises and citizens to cross thresholds, and
- move faster to mandatory solutions especially for enterprises.

**Annex II**
Real Time Economy Program – first phases