Roadmap for realisation of the Nordic Smart Government ecosystem
The two million small and medium-sized enterprises (SMEs) in the Nordic region comprise more than 90 percent of our businesses. The SMEs thus form cornerstones in our societies and for our future welfare.

The vision of Nordic Smart Government is to create value for these SMEs by making real-time business data accessible and usable for innovation and growth.

By 2027, with new products and optimised services based on real-time business data, the potential value across the Nordics is estimated to be around 14 billion EUR annually (EY 2017)
The Nordic Prime Ministers’ ambition:
Making the Nordic region the most integrated region in the world

The Governments in the Nordic region have a common vision of making the Nordic region the most integrated and sustainable region in the world by 2030.*

The collaboration on Nordic Smart Government (NSG) supports this vision by setting the framework for aligning the digital infrastructure between businesses, service partners and authorities, in order to make life easier for businesses in the Nordics.

Moreover, NSG works at reducing barriers within the Nordic region and between our businesses, and to enable innovation and growth through the fair use of business data and a more coherent digital development – thereby integrating the region even further.

The Nordic market is a substantial market for all Nordic countries, with inter-Nordic trade accounting for roughly 20% of each country’s exports. Nordic integration is increasingly relevant and important to our economies.

Therefore, NSG aims at making it simple to send and receive e-invoices and e-receipts between Nordic businesses, and to make it easier to deliver digital services in other Nordic countries, and thus increase competition and the digital and data-driven service level for the SMEs.

Nordic Smart Government seeks to realise the Nordic-Baltic declaration on digitalisation (2017) which sets out the following policy goals to make the region a digital frontrunner:

1. Strengthening the ability for digital transformation of our governments and societies, especially by creating a common area for cross-border digital services in the public sector
2. Strengthening the competitiveness of our enterprises through digitalisation
3. Enhancing the digital single market in the Nordic-Baltic region

Though the Nordic region is one of a kind, the vision of NSG aligns very well with the European vision of a Digital Single Market and supports the business-related EU Data Strategies, including “A Fair and Competitive Digital Economy” and the strategies for EU-wide interoperable data spaces. NSG is also dedicated to the general ethical guidelines set out by The EU Presidency Conference on Data Economy, taking place in Helsinki in November 2019.

The Nordic collaboration on Smart Government is not working independently, but is drawing on many strategies, programmes, projects and networks for insights, inspiration and alignment (see the reference list here).

*N The common vision was adopted by the Nordic Prime Ministers on August 20, 2019: https://www.norden.org/en/declaration/our-vision-2030

NSG is co-financed by Nordic Innovation. Nordic Innovation is an organisation under the Nordic Council of Ministers.
Introduction to Nordic Smart Government

The vision of Nordic Smart Government is to create value by making real-time business data accessible and usable for innovation and growth across the region in an automatic, consent-based and secure manner.

Sales and purchases – trading – is at the core of what all businesses do. This is where business data arise. Trading involves a number of administrative processes to the companies, including e.g. placing an order, sending an invoice, collecting receipts, bookkeeping, accounting and reporting. Today, these tasks are to a large extent done manually and/or with manual interruptions, typing or writing information from one system into another, or from one piece of paper into another. For example, most of the invoices that SMEs receive are either PDFs attached to an e-mail or in paper form, and the SMEs must manually type the information from the invoice into the SME’s business system – if they use digital business systems at all.

The business data in sales and purchase processes contain information about the specific business transactions: information on the product or service, quantity, size, VAT, date, buyer or seller, payments, and accounting information etc. In general, however, digital business systems are not sufficiently aligned, so data cannot be automatically reused between these systems.

NSG wishes to align the digital business systems, so buyer and seller more easily can exchange business documents and reuse data automatically in orders, order confirmations, invoices, payments confirmations, receipts, etc. There is a great potential if this business data from sales and purchases could be reused directly and automatically, both for government purposes (e.g. reporting) and for trusted 3rd party service providers, such as for example creditors.

Real-time business data is a source of innovation and growth. EY (2017) has estimated the total value of this data-driven innovation to be in the range of 24,8-27,5 billion euro annually in the Nordic region. New services enabled by real-time data include instant cash flow overview, better credit access and increased liquidity, better analysis, benchmarking, and monitoring of sectors and industries, as well as improved traceability of products.

However, the SME’s own business data today remains mostly analogue and unavailable for digital exchange and new services, and thus cannot inform and aid the SME when making business decisions. Nordic Smart Government has united authorities and stakeholders to agree upon standards and compatible formats for data, so structured data can flow between systems and services, making sales and purchase administration more efficient for the SMEs, and to increase automation in government reporting and enable new services. This will integrate Nordic markets and benefit both SMEs and providers of business systems and data-driven services.
Increasing the use of structured business data in transactions

... will provide a higher quality of real-time business data that businesses can utilise while reducing the manual handling of bookkeeping.

This enables easier and better exchange of data, products and services, which will serve both service providers (bank, accountant, insurance) and trading partners...

... it will enable new data-driven services and business opportunities...

.... and serve authorities.
The NSG Roadmap: A Strategic Plan and Recommendations

A roadmap is a strategic plan that defines a goal or desired outcome and includes the major steps or milestones needed to reach it. The NSG roadmap shows the way for realising the NSG vision, and it defines the requirements necessary for this. The governments’ task is to create a framework for aligning the digital infrastructure in the Nordic region, and the framework is presented in this roadmap. Thus the roadmap of NSG sets a direction for Nordic digitalisation and collaboration over the coming years, involving also development in co-creation with the private sector, as well as with relevant standardisation and governance bodies. The roadmap should not be read as a five-year plan set in stone, but more as an agile strategy showing the potential value of NSG and identifying possible actions to realise value, step by step.

The Nordic countries have different legislations and varying digital maturity in the market, and each government must therefore set a particular course for reaching the waypoints of this roadmap. Some countries may need or prefer legal amendments, while others may tread a voluntary path towards the vision of NSG. In order to increase integration in the region, the national developments should to some extent be synchronised and the road should be traversed in a continued Nordic collaboration. To save development costs, digital solutions and experience can be shared and systems extended to support the alignment, where possible.

In six particular areas, each Nordic government should take needed actions. These so-called capability areas are visualized in the diagram on slide 7. The capability areas include many discrete elements (technical, legal, and/or organisational changes and actions). The areas comprise over 100 possible actions, which may be employed in order to implement the capabilities. These are shortly described via the link on “Bundled Actions” provided in the appendix (see slide 25).

The actions necessary to achieve each of the steps might vary from country to country. When relevant, new services can be developed in collaboration between several countries, serving both national needs and solving cross-Nordic challenges at the same time.

“Capability” is a technical term, but this roadmap translates it into easy-readable descriptions of solutions that relate to capabilities. The solutions are presented further down (slides 11-16), including recommendations for implementing actions and regulation. The diagram on the following slide merely offers an approximate visualisation of the steps that need to be taken for each of the five solution described on slide 11-16. Stakeholders are invited to participate in co-creation to ensure an efficient and aligned development to the benefit of all parties.

The developments and changes will take several years. Note that the timeline in the diagram is not accurate, but depends on varying degrees of standardisation and existing national solutions and services. Milestones and choice of actions are also subject to annual evaluations, revisiting the prioritisation and funding.
Main areas of alignment and focus areas for realising the ecosystem
Timing and activities are approximate, and subject to yearly evaluation and prioritisation.

**SHORT TERM** (2020-2023)
- Adoption of e-invoices
- Adoption of e-orders
- Adoption of e-receipts
- Adoption of e-catalogues
- Technical access
- Align financial reporting
- Semantic content

**MID TERM** (2024-2025)
- VAT automation in B2B trading
- Adoption of product information
- Legal basis for Open Accounting
- Non financial reporting
- Analytics and statistics
- Compliance services
- Confidentiality and discretionary control
- Business registration with digital systems

**CAPABILITY AREA 1**
DIGITAL BUSINESS DOCUMENTS
- Adoption of e-invoices

**CAPABILITY AREA 2**
ACCESS TO TRANSACTIONS (APIS)
- Adoption of e-orders
- Adoption of e-receipts
- Technical access

**CAPABILITY AREA 3**
REPORTING AND ANALYTICS
- Semantic content
- Semantic content

**CAPABILITY AREA 4**
COMPLIANCE
- Adoption of e-catalogues
- Semantic content
- Semantic content

**CAPABILITY AREA 5**
SECURITY
- Adoption of e-orders
- Adoption of e-receipts
- Technical access

**CAPABILITY AREA 6**
GOVERNANCE
- Adoption of e-catalogues
- Semantic content
- Semantic content

**MAKE LIFE SIMPLER FOR SMEs INTEGRATED NORDIC REGION**
- Digital business documents
- Product information
- Open Accounting
- Simplified reporting
- Born digitally
- Reliability and Data Quality

**PRODUCT INFORMATION**

**SHORT TERM** (2020-2023)
- Adoption of e-invoices
- Adoption of e-orders
- Adoption of e-receipts
- Adoption of e-catalogues
- Technical access
- Align financial reporting
- Semantic content

**MID TERM** (2024-2025)
- VAT automation in B2B trading
- Adoption of product information
- Legal basis for Open Accounting
- Non financial reporting
- Analytics and statistics
- Compliance services
- Confidentiality and discretionary control
- Business registration with digital systems

**CAPABILITY AREA 1**
DIGITAL BUSINESS DOCUMENTS
- Adoption of e-invoices

**CAPABILITY AREA 2**
ACCESS TO TRANSACTIONS (APIS)
- Adoption of e-orders
- Adoption of e-receipts
- Technical access

**CAPABILITY AREA 3**
REPORTING AND ANALYTICS
- Semantic content
- Semantic content

**CAPABILITY AREA 4**
COMPLIANCE
- Adoption of e-catalogues
- Semantic content
- Semantic content

**CAPABILITY AREA 5**
SECURITY
- Adoption of e-orders
- Adoption of e-receipts
- Technical access

**CAPABILITY AREA 6**
GOVERNANCE
- Adoption of e-catalogues
- Semantic content
- Semantic content

**MAKE LIFE SIMPLER FOR SMEs INTEGRATED NORDIC REGION**
- Digital business documents
- Product information
- Open Accounting
- Simplified reporting
- Born digitally
- Reliability and Data Quality

**PRODUCT INFORMATION**
Milestones

- **By 2021**, a public-private advisory board has been established to support the implementation of the NSG roadmap

- **By 2022**, 70% of the Nordic SMEs use a digital business system

- **By 2023**, SMEs can freely choose to move their business data between business systems

- **By 2023**, sales and purchases can be handled digitally by default in compatible formats across the Nordic region

- **By 2023**, 80% of the Nordic business systems have implemented common tools (APIs), so service providers can access an SME’s data with appropriate consent

- **By 2024**, 80% of the invoices sent in the Nordics are digital

- **By 2025**, the Nordic SMEs have saved 500 million EUR by using smart services and real-time data

- **By 2027**, the Nordic countries are the most integrated region in the world
Challenges experienced by the Nordic SMEs

In 2019, the NSG programme conducted workshops and in-depth interviews with 50 SMEs across the Nordic countries. The aim was to identify barriers and obstacles experienced by SMEs in their day-to-day processes. The findings and possible solutions have been explored in dialogues with actors that have SMEs as their customers, e.g. business systems vendors and other third-party services.

Key findings (detailed on the next page):
• SMEs work with paper based processes – even if they use digital tools
• SMEs cannot transfer their accounting data and choose new services
• SMEs lack information on potential business partners’ trustworthiness
• SMEs experience time-consuming credit assessments
• SMEs lack an overview and easy control of cash flow and liquidity
• SMEs are uncertain about formal requirements when going Nordic

These findings are all connected to the same basic problems: Transactions that are handled via paper documents, systems that cannot exchange data, and a tendency in public sector of developing stand-alone solutions that do not fully accommodate the basic business administration processes.

Based on workshops and interviews, NSG has identified user needs and formulated user principles to guide the future work. The purpose is to ensure that the SMEs’ needs are prioritised, increasing the likelihood of support for the NSG vision. The NSG User Principles are found here.

The Pains of Nordic SMEs
SMEs often do administrative work in evenings and weekends. This also involves hours spent on manually typing data into digital self-service systems when reporting to the government. Much typing is necessitated by poor interoperability between systems. The manual typing also results in errors that would be avoided if administrative tasks, such as bookkeeping and reporting, were automated to a higher degree. The manual work of typing hinders the SMEs in getting real-time insights into their current financial situation. They often worry about whether they have money to pay their employees, about their liquidity, and how they are doing compared to competitors.

Testimonials from in-depth interviews:
“’I’ve heard since 1983 that everything is going to be simpler, but so far it has only become more complicated” (SME, NO)
“I wish I had an instant overview of my business financial statement” (SME, DK)
“Systems that could help are too expensive and it takes too much time to switch from the old systems to new ones” (SME, FI)
“I need a strategic overview of liquidity, VAT and the accounts when I have a need for major investments” (SME, DK)
Exploring the Challenges of the SMEs

The following further explains the challenges that SMEs face today in their day-to-day business administration.

**Case A: SMEs work with paper-based processes in daily transactions**
The majority of Nordic SMEs still send their invoices on paper or PDF, and spend time on manually typing in prices, numbers and product information during sales and purchases. Since these inefficient workflows are not yet fully digitalised, information is lost or cannot be transferred to other systems, and data cannot flow digitally in real-time.

**Case B: SMEs cannot transfer their accounting data and choose new services**
SMEs vary a lot and have different needs. Contrary to the bigger companies, SMEs cannot usually afford the costs of tailormade digital business systems that meet their exact needs. Although many business systems provide a platform for add-on services, the SMEs’ choice of data-driven services is limited to the services available on each vendor-specific platform. Each platform usually use proprietary and largely incompatible data formats. A related challenge appears when an SME wants to switch to another business system, because transaction and accounting data cannot readily be moved between systems and service providers. Therefore, there is a risk of vendor lock-in effects.

**Case C: SMEs lack information on potential business partners’ trustworthiness**
SMEs have a limited overview of their trading partners’ current financial situation. It may be difficult to reliably check basic facts about a new customer or supplier, or to in fact a fraudulent business. Not much updated information is available or easily interpretable for SMEs wanting to know their Nordic partners.

**Case D: SMEs experience time-consuming credit assessments**
SMEs do not have easy access to real-time information about their financial situation, nor do they have formats for easily sharing credit relevant information. Current credit assessment processes are time-consuming, causing much manual work for both the SME and the bank or the credit institution. This makes it difficult or costly to obtain smaller loans and the total amount of liquidity in the market to support growth is limited.

**Case E: SMEs lack an overview and easy control of cash flow and liquidity**
It is time-consuming to get an adequate and timely overview of the economic situation, when calculations are done using Excel and manually collected data. SMEs that rely on paper-based processes cannot readily benefit from existing advanced tools that may help them stay on top of their day-to-day situation and analyse their performance. Lacking an updated overview and easy handling of the latest data, it is difficult for SMEs to make informed decisions.

**Case F: SMEs are uncertain about formal requirements when going Nordic**
Cross-border business in the Nordic region involves extra administration for the SMEs, and they are uncertain about which formal requirements and regulations that apply in cross-border trading. They worry about whether they do things correctly, for example report to the right authorities, or if they get the VAT right when invoicing Nordic trade partners. Many SMEs lack knowledge about administration and compliance when trading or doing business in another Nordic country.
Six solutions to support the Vision of NSG

- Digital Business Documents
- Open Accounting Sharing Bookkeeping Data
- Digital Product Information
- Reliability and Data Quality
- Born Digitally
- Simplified Reporting
Solution 1: Increase the Adoption of Digital Business Documents

Background and purpose
High-quality data is the foundation for a future ecosystem of data-driven services. Data is generated in the daily business processes of sales and purchases, but to get the benefits of high-quality, structured data, SMEs must use digital business documents (such as e-orders, e-invoices, e-receipts, etc.) in standardised formats. This will reduce manual and paper-based processes and save time for SMEs.

The existing European digital infrastructure, network and standards used for invoices in public procurement is also suited for business-to-business transactions. The use of digital business documents in this format and network makes trading across the Nordics easier, and the high-quality data from the transactions can be used in the SME’s digital business systems instantly. This enables higher degrees of automated bookkeeping and simplifies reporting to governments, and may give the SMEs a near real-time insight into their financial situation. Digital business documents will provide the foundation for a data-driven business environment.

Recommendations for increased adoption of digital business documents
The Nordic countries have all implemented digital invoices in public procurement, but other digital document types (such as receipts or orders) either lack widely accepted standards or are only adopted in a few industries. Standardisation bodies and government authorities should continue work in this area and support the transition for Nordic SMEs.

Legal amendments may be needed eventually to increase digital business document adoption, because there is a lack of incentives currently to use the digital document formats. The introduction and use of these documents should be supported by broad partnerships between business system vendors, business associations for SMEs and relevant sectors (i.e. accountants or credit institutions), and government authorities.

Increased use of business systems will contribute to increased adoption of digital business documents. In addition, the business registration process could, from the very start, guide a new SME towards selecting business systems which supports digital business documents and the European infrastructure for transporting these documents.
Solution 2: Open Accounting – Sharing Bookkeeping Data

Background and purpose
Open Accounting is a secure way to give service providers access to an SME’s financial information from bookkeeping. Open Accounting enables the SMEs to voluntarily share their data from digital business documents with third parties of their choice. This is done through standardised content and interoperable APIs. APIs are interfaces for sharing data between digital systems, and interoperability means that different systems can communicate.

For example, a smart warehouse management app could connect to any business system and read the latest transactional data to calculate and check the current stock of products. An SME might also connect their business system to their bank during a credit assessment process, enabling direct read-only access to the bank’s system. In both cases, the SME avoids the hassle of manually exporting tables and setting up spreadsheet documents to deliver data and stay updated.

The purpose of Open Accounting is to create a competitive market for innovative solutions and services to the benefit of the SMEs. Standardisation reduces the development costs and makes new services usable with together with other systems and services. With the existing, non-standardised practices for data sharing, a new service or application must virtually be built from scratch when connecting to a business system. With the interoperability provided in the future by standard APIs, this cost is greatly reduced, and the SMEs will have access to a wider selection of services utilising their data.

Open Accounting also enables portability, which means that historic data can be transferred from one system into another system. It means that the SMEs can also change service provider, which is a necessity to a competitive market.

Recommendations for increasing the use of Open Accounting
To the benefit of the SMEs, the business systems should enable third-party access to financial transaction data, with consent from the SME who owns the data. The data should be structured in a standardised way, with harmonised definitions of accounting data. Today, several file formats exist (e.g. SAF-T and XBRL-GL) which are useful for defining accounting data. These are already used for audit purposes and for portability (that is, for transfer of data between systems).

Private and public actors may prefer voluntary paths for delivering standardised data sharing among businesses and third parties, finding a compromise that respects current business models of business system vendors and third parties such as banks. If necessary, interoperability and portability could be regulated.

The sharing of data should comply with privacy and trade secret regulations, and must not compromise GDPR (the General Data Protection Regulation), which requires confidentiality and protection of sensitive personal information. However, GDPR affects only a very limited set of business data, where sensitive information should always be protected.

The data sharing described here is limited to standard ways of accessing and reading accounting information in business systems, but not creating or updating accounting information.
Background and purpose
In business documents, product information describes the basic type of a product or service: a windowpane, an apple, or a slab of concrete. For any company, detailed information about traded goods or services is necessary in business and production processes. Accounting and VAT calculations are based on the products and services that are being purchased and sold. Many small companies, even when using digital business documents, make invoices that include free-text descriptions without product codes. Detailed and structured product information is often lacking, preventing the development of automated accounting and VAT postings. In addition, machine-readable product information and codes in e-order confirmations, e-invoices, or e-receipts may be used directly by different applications. For example, this reduces manual administration in warehouse management.

In a wider sense, product information is in increasing demand among many stakeholders and is relevant in green procurement processes, where data on environmental impact, product lifecycle and material consumption are required. This will also enable digital traceability and improve auditing of green data, and make the transition to a greener and circular economy more data-driven.

Recommendations for standardisation and increased adoption
Today, product information in orders and invoices varies in content and level of standardisation. To be digitally manageable and to enable automation, information about products and services must be standardized and machine-readable. Product information in e-orders, e-invoices and e-receipts should be based on e-catalogues and used consistently across the digital business documents.

Implementing product information across many industries will likely be a long-term process. Many good starting points for standardisation already exist today internationally and in the Nordics. Existing global product registries and their standards, for instance, should be identified, indexed, and possibly developed. The use of product codes from existing data pools and common product classification registries (e.g., UNSPSC) should be widespread in digital business documents. Such codes enable business systems to retrieve additional product information from registries and catalogues, and eventually to automate e.g., VAT calculations and reporting.

Relevant sectors especially in e-commerce should adopt and support standardized e-catalogues with product codes linking to additional sources of product information and use adequate product information in e-order confirmations. Governments could lead the way in e-commerce by promoting e-commerce in general and demanding the use of e-catalogues in public procurement.
Solution 4: Access to Data Services to verify Reliability and Data Quality

Background and purpose
Realising NSG is dependent on high quality bookkeeping data. Unless the data is correct and reliable, they cannot be used in automated processes and shared with confidence in real time. Reliable bookkeeping data, can be supported by public registries, such as verification of the identity of business partners, through registration number and business register data provided by a Nordic business register. Governments, by their role in society, have authoritative information about businesses and on events throughout the lifespan of a business that is relevant for verification purposes.

Explicit solutions for ensuring quality and authenticity is especially important for cross-border trade, where the parties can not rely on knowledge about national systems and culture to make qualified assumptions. Quality data verified by public registries is also crucial in order to achieve correct Annual Reports as well as correct tax calculations and statistical reporting.

One situation to be addressed is the honest mistakes, when invoice is issued, resulting in low quality data in a document (e.g. erroneous registration number, old addresses, typing errors in bank account numbers in invoices) creating a need for manual procedures at the end of a transaction. Such mistakes can be reduced by business system providers making use of the real time public data accessible via APIs, such as business registry data (registration number, addresses), bank account data and eligibility for VAT in the functionality they offer to the SMEs.

National solutions exist in varying degrees, often for public procurement. Similar solutions must be available to businesses in general, and also work cross-border in order to achieve the vision of NSG. The Governments are in a key position to offer access to public data to increase the quality of the bookkeeping data and make it simpler for the SMEs to operate.

Recommendations for increasing reliability and quality of data
The government’s role is to create a framework for fair competition among honest businesses. This can be achieved by sharing public data efficiently in the ecosystem. Nordic businesses have the same need as governments, in reducing their risk. Thus, public data for this purpose is in demand by digital business system providers, which can provide better services to their customers. With this kind of data and services, the SMEs can improve the quality of the bookkeeping, reduce acceptance of orders from fraudulent parties and avoid accepting false invoices.

Expand and harmonise existing national solutions: Some national solutions exist, but data services must also work cross-border in order to achieve the vision of NSG, an integrated region where e-invoices can be sent across the region and automatically be included in the bookkeeping processes and data shared with other parties. It is therefore necessary to assure that digital business system providers can employ government data from the whole region, and not only at national level. Governments should harmonize these services across the Nordics, making it just as easy to verify data from a subcontractor or vendor in Finland as a domestic Swedish partner.

Open Government Data as a starting point: The information which has a relevant public interest should be made available for services to the SMEs and their business systems. Within the limits set by national law and political context, the data should be shared for private parties to build services.

Beyond open government data: A future exploration with the participants in the ecosystem should be performed where possible new data that reduce manual corrections, increase automation and reduce risks are identified. Some of the information may be considered non-open, and the need for and possibility of sharing other data is subject to further investigation, e.g. bank account verification. A legal analysis framed by political context should be performed.
Solution 5: SMEs are Born Digitally

Background and purpose
Today, SMEs grow into the digital domain, but new companies should from the very start use digital systems that ensure consistency, digital processing of business documents and support compliance with law. Increased use of business systems will contribute to increased adoption of digital business documents, and ultimately enable new types of services and service providers.

Recommendations for tying together early-stage life events of businesses
The SME should be guided to “do the right thing” from the beginning. The first life-events of a company must be tied together digitally by a range of actors, not only business registries and tax authorities. All the relevant actors have a stake in the seamless and compliant digital birth of a company (the bank, the national ID provider, the business system, and sector-specific authorities regulating food production or environmental security, etc.), and all may benefit from reduced re-entering of information.

A fully digital, integrated process for the establishment and registration of a company in the national business registry would also make it possible to offer a tailor-made setup of the business: Depending on the business’ intended industry, the registration process can guide the SME about the requirements (for instance necessary certifications or approvals) that must be in place in order for the business to be compliant.

Solution 6: Simplified Reporting

Background and purpose
SMEs make several different kinds of financial reports to authorities, but the basis of such reports is always the business transactions. For example, reporting VAT to tax and reporting net sales or import/export figures to the national statistics agency is based on the very same transactional data from sales and purchases. While the data source is the same, the burdens related to calculation and submission process is quite different from one authority’s solution to another.

Recommendations for re-using structured business data in reporting
Automated reporting should be enabled and supported by law. The government should keep track of all reporting requirements imposed on SMEs, and make sure to coordinate the reporting requirements between agencies with similar needs. This coordination dialogue should also include the business systems vendors so that reporting requires the least amount of effort for all parties.

To lessen the administrative burden of SMEs, authorities must implement the “once-only” principle. Lessening burdens also requires that authorities align implicit and explicit requirements on SMEs, such as data formats and standards. By promoting a standard chart of accounts, automation and simplified bookkeeping may be enabled. Turning to reporting in surveys for statistical analysis, authorities should align their demands and thereby create data sets that are both detailed enough for statistical purposes and comparable for benchmarking in specific industries, while not revealing sensitive data.
Benefits of Nordic Smart Government - for many Stakeholders

Numerous stakeholder have been presented to NSG. SMEs, business system vendors, auditors and accountants and other value-adding services like banks, credit institutions and other IT service providers have engaged with the vision and its possibilities. Their feedback have been very positive, and stakeholders across the region and sectors wish to take part in the realisation of NSG.

**Benefits for Nordic Smart Businesses**
- Less manual typing and a higher degree of automation
- Higher data quality overall, better control of errors and changes in ordering and procurement processes
- Real-time overview of business profitability, cash flow, and product stock
- Simplified reporting and sharing of data with e.g. creditors
- Customised services for e.g. industry-specific needs and credit assessments
- Traceability of products and materials is enabled (e.g. chemicals, waste)

**Benefits for business system vendors**
- An expanded market where more SMEs would use business systems
- Business system vendors act as key players in the automation of government reporting. Stable regulation for reporting directly from business systems means less risk and a predictable future.
- With better interoperability between business systems and value-added services, the SMEs get a wider range of data-driven services available. Each business system can thereby cater to the needs of different types of SMEs

**Benefits for service providers in the financial sector**
- With structured data, banks will be able to better assess their SME customers’ credit risk in a simple and fast way. This way, banks can provide more accurate financing and reduced costs of loans for business customers
- Insights into real-time transactional data enables credit institutions to assess the risk of an SME that relates to its network of customers and suppliers.
- Costly and mandatory know-your-customer assessments may in part be handled using the same interfaces for accessing data as used in credit risk assessments

**Benefits for government authorities**
- The process of obtaining business data is simplified by enabling reporting directly from the business systems
- Compliance by design will increase correct and timely reporting
- Secure chains of real-time structured business data makes it possible to increase process automation and decrease manual errors
- Market developments can be monitored in real-time by authorities, and new data-driven policy can be developed in response to crises as they unfold

Other societal benefits include
- When it becomes less costly to provide credit to the SMEs, financing will increase and pricing of credits will become realistic as risk assessments are better. The increased liquidity stimulates the economy of the Nordics
- With further Nordic integration it becomes easier to trade across the region, which benefits the Nordic societies at large
In 2019, NSG has invited a range of external stakeholders and Nordic government authorities to contribute to developing Proofs of Concepts (PoCs) and prototypes. The PoCs developed demonstrated the technical feasibility of:

- Real-time data used in credit assessments
- Know-Your-Customer and network risk services
- Standard Business reporting
- Automated account posting
- Automated calculation of VAT
- Auditing based on standard transactional data
- Conversion service (SAF-T -> XBRL) making various report types compatible
- Direct extraction of business data for statistical surveys
- Real-time analytics dashboard

These PoCs also demonstrate how the following three building blocks:
1. a standard chart of accounts / standard mapping,
2. a standard representation of accounting entries and
3. a taxonomy for financial reports,
in conjunction can automate and digitalise financial reporting.

Please note that realising the benefits of the PoCs in real-life contexts is dependent on multiple factors, and that the PoCs also identified the challenges of today’s legal environments and technical setups.

The PoCs used the NSG reference implementation documented on GitHub, showing how Open Accounting APIs may be implemented in business systems, enabling access to transactional business data.

Digitalism Challenge
The Finnish NSG team, Aalto University, and Accenture hosted the Digitalism Challenge 2019, with around 100 students participating in 14 teams. The focus was on business activities and new services that can be made by use of real-time structured financial data within agriculture and micro-brewing industries. A solution for the farmers demonstrated they can be provided with a software that accesses the data and uses it to provide them with features they need in their daily work, such as easy stock management, self-monitoring of production and reporting. Farmers can check the current stock quantity for a product, order new products, book the ordered products into the stock from structured e-order confirmation and book the usage of the product out of the stock with the mobile app.

Nordic Data Sandbox Challenge
All of the central concepts explored by NSG relating to B2B services driven by real-time data flows were covered by the participants in the Nordic Sandbox Challenge (hosted by Copenhagen Fintech Lab). Two winners were found between the eight contestants in the challenge. One winning PoC showed how simple accounting ought to be with increased automation, while the other winner showed that e-invoices flowing in real-time could improve the accuracy and time-to-market of credit assessments considerably. The NSG reference implementation and test data were used by challenge participants.
Realising the Nordic Smart Government recommendations will require action and major changes for several stakeholders.

**Business systems should...**
- Adopt EU-wide common standards (PEPPOL), connect to the European eDelivery network, and thereby push for the use of e-documents * (such as e-orders, e-invoice, e-receipts, and e-catalogues)
- Implement common tools (APIs), so service providers can access SME’s data with given consent
- Integrate with Nordic-wide systems for eIdentity, powers and mandates
- Offer standard contract terms, empowering SMEs to use whatever business systems and combine services according to their needs
- Promote national standard chart of accounts where one exists, and connect the core elements of the national chart of accounts to each other in a common minimal Nordic chart of accounts

**To become Nordic Smart Businesses, SMEs should...**
- Use digital business systems and services
- Use e-documents*
- Share data with trusted parties to get better services

**Government authorities should...**
- Support innovation and the creation of new services by providing data related to businesses via open APIs
- Make business registry data freely available in a secure manner
- Support and implement common identity and e-address mechanisms
- Make public procurement digital by using e-documents*
- Work towards enabling standardised digital reporting to authorities directly via business systems and ensure compatibility in reporting demands
- Standardise national chart of accounts with Nordic harmonisation and push for increased adoption of chart of accounts
- Clarify different parties’ rights and obligations with regards to business data through terms and conditions in standard contracts (based on dialogue with different actors on the market)
- Define a guideline for data ethics in this field, and define the terms for making data available for analytics and artificial intelligence. These terms and the ethic guidelines provide the frame for developing smarter public and private services with respect for the SMEs

**Service providers should...**
- Create new systems/services once data are standardised and made available
- Accountants and auditors will have to digitise and automate key areas of their core business
- Banks and credit institutions must provide new services based on available real-time data from both business systems and from public registries

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* = e-documents, as currently defined by the OpenPeppol organisation, are e-invoices, e-catalogues, e-orders, e-despatch advice, e-credit notes, e-reminders and e-receipts. The choice of OpenPeppol as the default for e-documents does not imply that other document types or EDI-solutions are considered irrelevant.
Implementation and Governance

To realise NSG, it is necessary to bridge the many ongoing developments across the Nordics and to establish efficient collaboration between private and public stakeholders is crucial. Governments must define the framework for change, take responsibility for necessary regulatory amendments and standardisation, lead the change process and engage in co-creation with the private market.

Private actors, such as business system vendors and other service providers, are essential as they have to adopt common standards and adjust to accommodate data sharing. Like the authorities, private actors must also invest in developing existing systems and services, and they must also invest in new services to benefit from the NSG recommendations.

National developments must be coordinated and decided upon nationally, while still maintaining coherence between Nordic and national levels. The government authorities participating in NSG 3.0 are thus expected to lead further developments relating to the solutions and capabilities identified. A major task for them in the implementation phase is the alignment of national initiatives, standards and infrastructure.

In order to make an efficient implementation, a Nordic steering group with a secretariat and public-private advisory board must be set up. The public-private advisory board will provide counsel to the steering group on opportunities and challenges in the market, which is necessary to synchronise development and to increase Nordic integration. The steering group will be responsible for alignment and strategic prioritisation of common Nordic initiatives and public investments, and alignment with the national developments.

The governance of NSG should be established with the aim of ensuring coordination between the various stakeholder groups. It will be necessary to synchronise national and Nordic initiatives and actions, ensure alignment with stakeholders in the field of Pan-European standardisation, and work together on communication and the development of cross-border services. One example of this is common API services.

An important aspect of this collaboration will be aligning and coordinating a strategy on how to influence standardisation work and regulatory initiatives at the EU level.

Recommendations on actions are likely to evolve with new opportunities, technology, and market developments. The work and progress will therefore be continuously evaluated, and new insights will be accounted for in order to adjust prioritisation of the work. Accordingly, the present roadmap is a proposal for working together in the years to come, and for moving forward in the same direction in order to realise the potential of digital investments.
Information about products and production - beyond financial data - is increasingly in demand by different stakeholders, such as service providers, creditors, government authorities, investors, and consumers. Green data is in demand due to increasing public awareness and attention, and in the years to come, this attention will be decisive for businesses as well. Green data will be a parameter for competition, and social, environmental, and climate responsibility can be expected to have an increasing economic importance.

The EU commission’s draft Action Plan on Circular Economy states that “as of 2030, only safe, circular and sustainable products should be placed on the EU market”. Demonstrating sustainability, for example, will require substantial non-financial information to be efficiently shared, audited and reported through supply chains and to the market.

By supporting processing of structured product information in the digital business documents (in particular in digital orders), NSG delivers a basis for efficiently sharing not only financial data, but also non-financial data.

With further development of structured and standardised data, we can achieve better transparency of environmental, climate and social conditions in the economy. The infrastructure envisioned in NSG offers a basis for efficient sharing of these data as product information – integrated with core economic data in e-documents. Unless the non-financial data are structured and standardised, it is likely to become an extreme burden for the Nordic SMEs to transform to the new climate agenda. With new reporting demands, auditing and control will become difficult, and it will become costly to avoid fraud.

These perspectives are further elaborated in this “Memorandum on Non-Financial Business Data For SMEs in the framework of Nordic Smart Government” from Center for Circular Economy.

Future perspectives: Green Business Data can be shared in Real Time
Nordic Collaboration in NSG 3.0 (2018-2020)

The Nordic collaboration on Smart Government was initiated by the Nordic business registries in 2016. The idea of automating business reporting was further developed by conceptualising an open ecosystem for an automated, secure and consent-based flow of structured and standardised business data which may be utilised and accessed by public and private stakeholders.

The Nordic Ministers of Business launched the third phase of NSG in May 2018. The overall task for the programme was to define the requirements for enabling the ecosystem. To this end, a programme organization, involving 18 government authorities from all five Nordic countries, was established. The work has been performed in collaboration, with the institutions participating in the work to varying degrees. The conclusions and overall recommendations of the collaborative work is presented in this roadmap. The five Nordic Business Registries are contract partners of Nordic Smart Government 3.0 and are responsible for this roadmap.
The Benefits of Nordic Collaboration

This roadmap is the result of four years of unique Nordic collaboration under the leadership of a common Nordic steering group consisting of the General Directors of the five Nordic Business Registries.

NSG builds on national strengths and the collaboration has brought together people with different competences and experiences in an open and innovative setup. The programme organisation set up in 2018 to develop the roadmap, has almost doubled in size from around 30 persons in the start, to include more than 50 persons from more than 15 governmental organisations. The work has been carried out in working groups across countries and institutions, in a semi-agile set up with weekly virtual meetings and common digital workspaces.

By working together in this way, the responsibility and ownership for NSG is shared. This is a great asset to further Nordic integration. The common experience is that the Nordic countries in collaboration can do more and do better than each country could do on its own. NSG has also influenced and contributed to national initiatives in the area, such as the Real Time Economy in Finland and Automatic Business Reporting in Denmark.

The add-on achieved only by Nordic collaboration is a dedicated engagement for furthering Nordic integration where businesses can operate easily across borders.

Additional core value emerging from the NSG collaboration includes:

- By supporting compatible digital standards, it becomes easier to automate processes and to do business cross-borders in the Nordics, which contributes to growth.

- By aligning standards across the region, it also becomes easier for the service providers to offer services in a larger Nordic market, and thus increase the services available and the competition for the benefit of both the service providers, the Nordic SMEs and the region as a whole.

- By helping Nordic companies become more competitive and better suited for international competition, the Nordic market presence is strengthened globally – and a common Nordic market will be more robust than each national market on its own.

- By utilising the business data for the benefit of SMEs and other parties, the Nordic region, already being a digital frontrunner, may also lead the way for the European Union with a fair and beneficial use of business data.

- By making a Nordic model for the shared development of the common digital ecosystem, core Nordic principles of transparency, trust, sustainability, and the safeguarding of democratic rights are supported.
Introduction to Appendix

The appendix of this roadmap further details the vision and recommendations of NSG. First, the roadmap appendix visualises the recommendations on national levels and on a common Nordic level in a set of diagrams. These diagrams show a timeline of the main blocks of actions relevant in each national setting, and across the Nordics. The actions found in the diagrams are organised according to capabilities - high-level stable concepts describing the function or ability that actors must achieve in the ecosystem.

The capabilities may be implemented in various ways. NSG 3.0 has proposed a number of actions for businesses, business systems, government and others, to fulfil the vision of NSG and ensure the implementation of the capabilities. The actions are a menu of ideas, and need to be assessed for relevance in each country.

The six capability areas in the diagrams (see graphic presentation on slide 7) and the underlying capabilities of NSG come from assessing the vision and the drivers and needs of different stakeholders.

1. Digital business document adoption - the standardisation and implementation of digital invoices, receipts, orders and bank account statements and the adoption of them in business-to-business transactions.
2. Availability of transaction level information - in order to support sharing data with partners, portability, and audit. Includes common representation of transactions.
3. Reporting and analytics - reports and access to aggregated data and understanding the data across businesses.
4. Compliance - making sure the businesses have compliant digital systems and have the information they need to be trade securely. This includes data services to check validity and quality of business documents and verify basic data related to their trading partners.
5. Data protection and security - making sure data is well protected across the value network, restricting access, safeguarding data, maintaining availability and provide traceability.
6. Governance of the ecosystem at national and Nordic level.
Appendix - Table of Contents

• Graphic presentation of draft recommendations of national initiatives and actions:
  • Common Nordic diagram (found above, slide 7)
  • Deep link for the Finnish Diagram (draft) here
  • Deep link for the Icelandic diagram (draft) here
  • Deep link for the Swedish diagram (draft) here
  • Deep link for the Danish diagram (draft) here
  • Deep link for the Norwegian diagram (draft) here
  • Deep link for the Legal Amendment Uniform Timeline here

• Capabilities: https://docs.google.com/document/d/1v5iHELL30p5A41vbjFJY7HvaT5g6OTDS5LH2Lp_yXSQ/edit#heading=h.5voykp1iiqj7
• Bundled actions: https://docs.google.com/document/d/1rOcJD6S7utMRrCxulBMHQS9ZIrFG3VNc-JA1SbaUuhA/edit#heading=h.g3g4iihhcee6
• Legal analysis report: https://drive.google.com/file/d/1FVIaKi9XPU0cWygVJPdB2uQ3z0nL_E4K/view
• Legal amendments presentation: https://drive.google.com/file/d/1ClQIOgCsc9Cyk0AHHujlfado6WwJg-HN/view
• Architectural overview: https://docs.google.com/presentation/d/1Xqha6N4oblord5zdNWuts0uRvivmot3ZXte_i1zOKvY/edit#slide=id.p1
• Rulebook: https://docs.google.com/document/d/1iT1Z1RYtafqPulfiucNFCaJRZIREG4Nv5NFZR7LUf2c/edit
• Proofs of Concepts explored in the course of NSG 3.0: https://docs.google.com/document/d/1kyCRr2Q0OLDXvqsVz7Xwj7ekffpaZ0ao71Bya2lty9PA/edit
• User Principles: https://docs.google.com/document/d/1e15mM_cf-mg72a6dym4AFKllhE4alG4Tk3MgvyHpXc/edit#
• Short reading guide and index of all main deliverables: https://docs.google.com/document/d/1eAmtn7TMJXFULojb4fQH7dYlgjoazrh3g2eKZzhFVJQ/edit
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