# 2019

## Feasibility study
## Showcase B: Cross-Border Business Registration using eIDAS
## DIGINNO WP3

# CONTENTS

**EXECUTIVE SUMMARY**

This showcase report provides an insight into the feasibility of facilitating Government-to-Business (G2B) cross-border business registration service using eIDAS. The feasibility report highlights the service feasibility, technical feasibility and the legal feasibility for delivering the service. The service was designed by adapting certain aspects of the diamond design process. There was also consultation with relevant public and private stakeholders involved in national eID delivery and business registration at the member states. These methodological approaches were used to evaluate the current state of the business registration process dubbed as the "As is". The methodology is used to further create the expected vision of how a cross-border business registration service should be implemented using eIDAS. This process was dubbed as the "to be".

An eIDAS enabled centralized business cross-border business registration infrastructure is the main outcome of the methodological process. The eIDAS infrastructure is what enables cross border service delivery. The centralized infrastructure dubbed "the EU business registration connector" is a middleware, housing software brokers that enable business registration transactions and search for relevant information. The middleware interconnects the existing business registration infrastructure. It also enables company owners and company representatives to register their business across national borders in Europe. The infrastructure saves time and cost for the business owners. It further enables the business registrars and possible relevant agencies to conduct verifications the backend.

This report via the service implementation model indicates that there are financial, organizational, and potential market possibilities towards the implementation of the infrastructure that will deliver the service. However, the identified feasibility is only possible if the legal challenges are solved. This report also provides an insight into the possibility of dealing with the legal challenges.

The report also highlights the perceived usefulness of that the service to national business registrars and the service can be implemented using Public-Private Partnership. The report also identifies the funding possibilities for the development of the infrastructure and the potential cost sharing agreement in the PPP framework.

Therefore, this report finds the prospects of developing a cross-border business registration service using eIDAS, positive. However, to ensure the feasibility of the showcase, regulatory and policy recommendations are provided herewith.

# SECTION 1. INTRODUCTION

This showcase is provides an insight into the feasibility of developing a digital Government-to-Business (G2B) cross-border business registration service in Europe. A cross-border service, as understood in this report, is a service in which the service producer is in one country and the service consumer is in another country. In this showcase, the service producer is the national business registrar in one country and the service consumer is either a company owner or company representative in another country. The company owner or company representative is a natural person who represents a legal person, such as a sole proprietorship, a partnership, a limited liability company. The interest of the natural person could be to either establish a legal person as a new company in another member state or as a branch in another country.

The aim of the showcase is to identify how eIDAS can enable G2B cross-border business registration across European countries. The current implementation of eIDAS by EU and EEA member states presents the possibility for the cross-border technical interoperability between national business registration systems and eIDs from other member states.. This is especially so when it comes to the ability for company owners and company representatives to register their business across border with a verified e-identity (eID).

However, currently eIDAS only allows access to cross-border public services, including cross-border business registration processes. However, in reality, the eIDAS framework has potential to enable cross- border transactions. This of course depends on how eIDAS is implemented across the member states. Furthermore, eIDAS is also used to map natural persons to legal persons as a means of verifying the identity of natural and legal persons. Such verifications could lead to the prevention of fraudulent activities such as, company hijacking etc. But how can these positive cross border potentials of eIDAs be achieved? How can eIDAS be used to facilitate technical cross-border interoperability with national registration systems? and how can eIDAS facilitate cross-border business registration? These questions are answered in this showcase.

Moreover facilitating cross-border technical interoperability with eIDAS is not possible without cross-border legal interoperability. If the national laws does not support technical interoperability, then the attempt to implement technically operable solutions will be illegal. This will obviously obstruct the delivery of G2B cross-border business registration service delivery in certain European

countries. It will also limit the potential of eIDAS in enabling cross-border business registration in Europe. Hence, in the developing of this showcase, the hope is also to find answers to legally related questions on legal interoperability be implemented to facilitate cross-border business registration using eIDAS.

## 1.1 RATIONALE FOR THE SHOWCASE

Over the years, the EU has been actively promoting the freedom of movement for citizens and businesses within its borders. Currently, there is a greater freedom of movement of citizens than that of businesses. In the EU according to the EU e-government benchmark 2018, 87% of national centric business operation with governments are performed online and through a citizen centric web portal. These business operations include online registration of businesses. The challenge is that the national business registration systems in each member state has limited or no interoperability with relevant eID systems in other member states. Hence, online G2B cross-border business registration has been problematic. This problem has a negative impact on the mobility of businesses and the registration of new business interest across European member states.

In order to identify the dynamics of this problem, an assessment was conducted in the work package 3 segment of this project (DIGINNO). The identified dynamics of the challenges were technical and legal challenges. The regulatory dynamics highlighted the legal restriction impeded G2B cross-border business registration. The technical dynamic of the problem were:

- The lack of an online business registration system that supports certain business registration processes.
- The low technical interoperability readiness of existing national business registration systems. Hence most national business registration systems served national business registration processes.

These are not challenges that have been ignored by the European Union (EU). In the EU attempts have been made to tackle the regulatory challenges via the EU company law, the Single Digital Gateway Directive, regulations, E-government policies and the development of European Interoperability Framework (EIF) and upcoming company mobility directives, among others. The union has also adopted a fourfold approach towards tacking the technical challenges.

- Approach 1: The first approach is the facilitation of tangible technical solutions that interconnect and serve national business registrars. The notable examples are the EU E-justice

portal, the European Business Registrar (EBR) and the Business Registrars Interconnection System (BRIS) to mention a few.

- Approach 2: The second approach is via the financing of EU projects such as the The-Once-Only-Principle project (TOOP) and Stakeholder Community Once-Only Principle for Citizens (SCOOP4C) among other projects.

- Approach 3: The third approach is via the funding of the development of technical building blocks aimed at facilitating technical interconnectivity via the Connecting Europe Facility (CEF). The CEF building blocks are technical standards designed to enable cross-border interconnectivity of public entities in the EU. Some of the building blocks include, e-identity (eID), e-translation and e-delivery, among others. However, the building blocks mentioned are those that can support this showcase. But the emphasis will be on eID and e-translation.

- Approach 4: The fourth approach is via the indirect operational support provided in the development of cross-border interoperable public service infrastructure at the national level. Here the EU has provided some benchmarking tools under the 54 actions of the Interoperability Solutions for Public Administration, businesses and citizens (ISA$^2$). An example of such a benchmarking tool includes the Interoperability Maturity Assessment of a Public Service (IMAPS) to mention a few. IMAPs is relevant for accessing the level of interoperability in the delivery of cross-border services.

Similarly, some member states have made attempts to independently facilitate online cross-border business registration service delivery using their national eIDs. Examples include Denmark, Sweden, Estonia and the Netherlands. Now that EU and EEA member states are implementing eIDAS, much more European countries will have the possibility of, at least, providing cross-border access to their business registration systems. So far, eight countries have notified at least one of their eID schemes and are using eIDAS. These are Belgium, Croatia, Estonia, Germany, Italy, Luxembourg, Portugal and Spain,  This implies that at present very limited public services, including business registration, can be accessed online remotely within the EU.

Although the implementation of eIDAS sounds promising for cross-border service delivery, the framework has limitations. These limitations stems from national laws which may still impede upon cross-border business registration process, when a company owner or company representative logs in with eIDAs. These limitations and how it could be solved to facilitate cross-border business

registration are highlighted in this report. It is based on the investigation of the limitation of eIDAS that prospect of this showcase was conceived.

Therefore, the rationale for this showcase is to come up with a technical solution and a service that will facilitate cross-border business registration in Europe. The solution is meant as a proof of concept that will make use of existing solutions (eIDAS) provided by the EU to demonstrate how this service can be delivered.

## 1.2 EXPECTED OUTCOME

The expected outcome of the showcase were twofold. The first is the development of an online cross-border business registration infrastructure, which will deliver the cross-border service. The service should enable company owners and company representatives in the EU/EEA to register their business in another EU/EEA member state, without being physically present. The second is an overview on the feasibility for the development and deployment of the service.

## 1.3 SHOWCASE PARTNERS

The DIGINNO partner involves in the showcase are represented in table1 below.

Table 1. Showcase participants

|   | Country | Organization | Type of organization | Participating Role |
|---|---------|--------------|----------------------|--------------------|
| 1 | Denmark | Aalborg University, Denmark | Higher Education Institution | Showcase lead |
| 2 | Norway | The Brønnøysund Register Center | National business registrars | Showcase member |
| 3 | Lithuania | Enterprise Lithuania | National business registrars | Showcase member |
| 4 | Estonia | Ministry of Economic Affairs and Communications | Estonian Ministry and DIGINNO Lead partner | Showcase member |
| 5 | Estonia | Tallinn Science Park Tehnopol | | DIGINNO project WP3 Show case coordinator |

The showcase development is a sub-activity in the Work package 3 in the DIGINNO project. Tallinn Science Park Tehnopol, as indicated in table 1, coordinates the sub-activity. Tallinn Science Park Tehnopol provided service development training for the showcase development. Also as indicated in

the table 1, Aalborg University, Denmark led in the development of the showcase. They coordinated the hands-on activities in the showcase. They are also in charge of the development of the feasibility report. The showcase members were technocrats from the Norwegian business registrars (The Brønnøysund Register Center), the Lithuania business registrars (Enterprise Lithuania) and the Estonian ministry of economic affairs and communications. These partners in collaboration with Tallinn Science Park Tehnopol executed the framing, and the development of the showcase.

The showcase partners worked in consultation with experts employed by national stakeholders involved in the delivery of national public infrastructure and services in their countries. These experts provided insight into the problems identified in the showcase and the prospective solutions. The affiliations of these experts are represented in the table 2 below.

Table 2. Affiliations of national experts

|   | Country | Organization (s) |
|---|---------|------------------|
| 1 | Denmark | • Danish Business Authority (Danish Business Registrars) <br> • Danish Agency for Digitization (Agency responsible for public sector digitization in Denmark) |
| 2 | Norway | • The agency for Public Management and eGovernment (DIFI) (Agency responsible for public sector digitization in Norway) |
| 3 | Lithuania | • Information Technology and Communication Department under the Ministry Of Interior, <br> • The Migration Department under the Ministry Of Interior, <br> • Information Society Development Committee under the Ministry of Economy, <br> • State Tax Inspectorate Under the Ministry of Finance of the Republic of Lithuania <br> • The State Enterprise Centre of Registers |
| 4 | Estonia | • Information System Authority [1] |

## 1.4 SHOWCASE TARGET

The showcase is designed for the providers, users, and indirect beneficiaries of the service and policy makers involved in online cross-border business registration services.

- The target users of the service include company owners or company representatives of who are either sole entrepreneurs or representatives of a branch of a company.

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[1] https://www.ria.ee/en.html

- The target service providers of the service are the national business registers.
- The indirect beneficiaries of the service include agencies mandated by laws in the member state to provide support services to the business registration process. Such agencies include public and a private agency. The public agencies include the courts (notary inclusive), tax authorities, licensing authorities and the police. The private agency are the banks and companies that may manage the infrastructure on behalf of the national registrars.

## 1.4 REPORT OUTLINE

The report has 9 sections. These are the introduction, description of service, service design, description of service, service implementation model, service feasibility, legal feasibility, technical feasibility, recommendations/conclusions.

# SECTION 2. DESCRIPTION OF SERVICE

The service being developed is an eIDAS enabled cross-border business registration service. This is a market entry activity. The service being developed is an upgrade of the existing national centric online business registration process. Hence, the service is expected to mimic core processes that already exist in a business registration process at the national level. Inorder to describe the new service, a description of the existing process and how it evolves to the new service is described.

## 2.1 OVERVIEW OF THE EXISTING SERVICE

The existing online business registration process can be classified into front-end and the back-end processes. The front-end process is where the company representative or the company owner sumbits the nessasary documents. The back-end process is where the national business registrar processes the submitted document. The front-end process includes, the filling, uploading and submission of the necessary forms; the payment of share capital into the bank account; the registration with the tax authorities; and the registration for licences (if necessary). The back-end process involes the processing of the application as mentioned earlier. This application processing process could include the verification of the identity of the applicant; the confirmation of the authenticity of the data provided by the applicant, verification that the applicant fulfils the national requirements for starting the type of business applied for and many other functions.

At each member state, the approach to online business registration varies from one jusrisdiction to another. This is mostly as a result in the slight variance in the requirements needed to start a business in each member state. However, there are commonalitites in the various national processes that can be identified when a company is registered online. The commonalities are as follows:

- **User log in with an eID**: The online business registration begins with the supply of an eID by the applicant. In this case the company owner or representative can be verified by a national eID. The national eID can be verified at the backend by the business registrar by contacting the national civil register, the police etc. depending on the prescription made by the national law. This process could be digital, if there is a Government-to-Government technical interoperability between the different agencies. The national eID contains minimum attributes or datasets that identify a person. It also contains optional attributes which enables either the company owner or a company representative to perform transactions with the national Business registrar. The transaction could either be the exchange of messages (submission of

forms etc.), or a financial transaction. The eID attributes enable prefilled forms highlighting the personal information of the applicant during the business registration process. However, there are cases where munimum data sets from the eID are used to access the service. In this case, the applcant has to apply additional personal information.

- **Submission of forms:** In addition to the provision of personal identity details, the applicant provides additional information. Such information ranges from the type of business the company wishes to engage in to memorandum of association, evidence of payment of share capital, and other relevant information required by the business registrar.

- **Payment of processing fee:** The next step is to pay the service processing fee and attest the submission with an electronic signature. The digramatical expression of this process is represented in the figure 1 below.
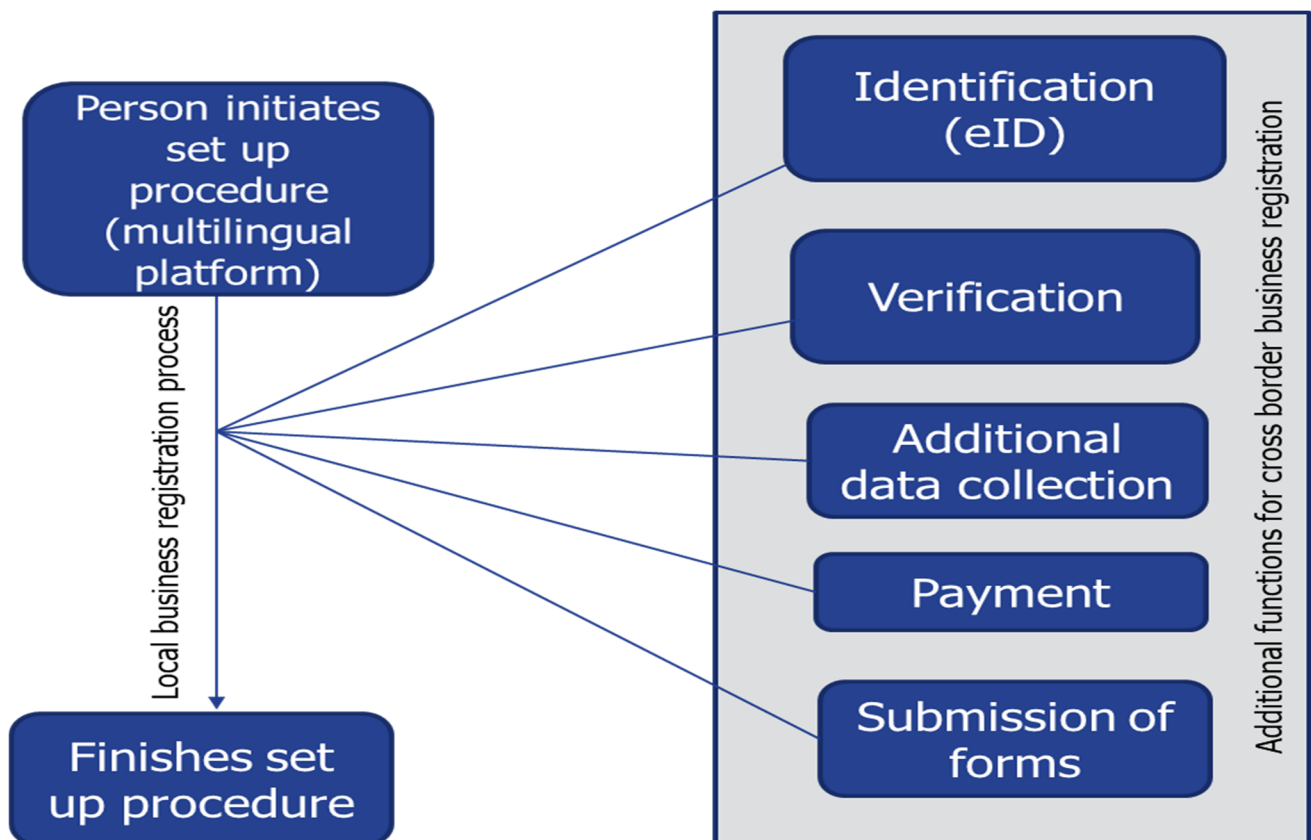
Figure 1. Local business regitration process

## 2.1 DESCRIPTION OF THE NEW SERVICE

In order to upgrade the existing process to a digital G2B cross border business registration process within the EU, a single change is made. That is the cross-border login via eIDAS. The other common processes remain the same. In this way, it accomodates the slight variance in the national business registration requirements.

The utilization of eIDAs is this service varies with that of other EU projects such as TOOP, mentioned earlier. In the TOOP project eIDAS is used to enable to enable cross-border access to the business registration system by the applicant. Once access is granted, the system the job of the TOOP infrastructure is done. However, the proposed adoption of eIDAS in the service goes a step further than TOOP, it actually utilizes the dataset accompanying the eID to enable a business registration transaction. The service has implications on national laws as will be discussed later in this report.

The proposed eIDAS enabled service will be delivered via middleware which will enable online cross-border business registration as well as facilitate search for business registration information. The business registration tansaction bit of the middleware will grant access to cross-border eIDs using eIDAS. It will also enable the provision of additional documents, possible payment of service fees and the sumission of forms.  The middleware will neither cater for the deposit of share captial nor extra agency requirements. Rather a proposal is made to encourage national agencies to facilitate G2G technical interoperability with relevant agencies to facilitate extra agency activities. Such agencies include the courts, banks (for payment confirmation messaging), the police etc

The middleware will interconnect the national business registrars in the member states with eID infrastructure from the originating member state. The interconnection will be enabled by the eIDAS framework at the front-end which will enable cross-border access to the middleware. The middleware will also be intefaced with interconnected eIDAS attribute gateways at the back-end. These gateways will support transactions by sending requests to the middleware to enable transaction. Detailed explanation of how this works is explained in the "to be" section of this report.

**SECTION 3. SERVICE DESIGN**

The service design phase is divided into three sections. The first section describes the methodology. The second section describes the "As is". The "As is" denotes the current state of cross-border service delivery, within the context being considered. The third section describes the "To be". The "to be" denotes the vision for future cross-border service delivery.

**3.1 SERVICE DESIGN METHODOLOGY**

The service design methodology used for this study is inspired by the" Double diamond design process". This is a process developed by the Design Council, UK. The methodology is represented in the figure 2 below.
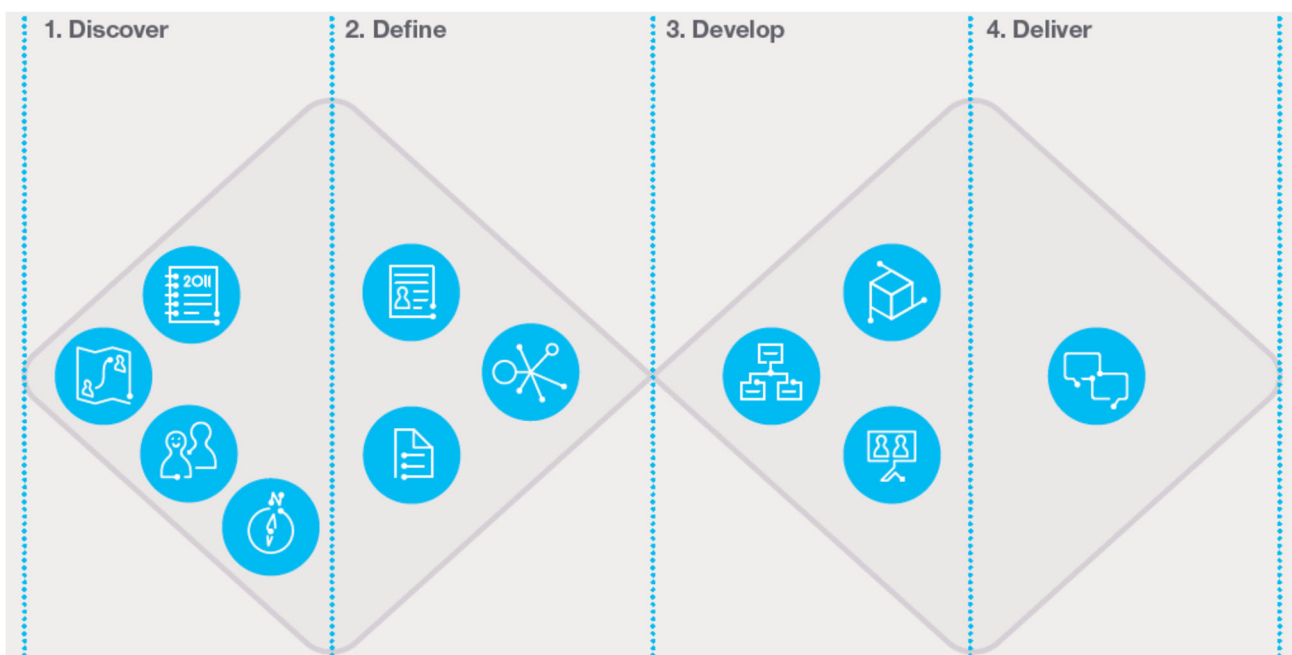


Figure 2: Diamond design process

Source: Design council UK[2]

The double diamond design process has four stages. These stages are:

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[2] https://www.designcouncil.org.uk/sites/default/files/asset/document/Design%20methods%20for%20developing%20services.pdf

- The discovery stage: This stage involves the identification of the problem and the needs that should be addressed in the design.
- The design definition stage: This stage involves the analysis and synthesis of the outcomes of the discovery stage. At this stage, the scope and the manner for implementation of the service is defined.
- The development stage: At this stage, the solutions are created, prototyped and tested.
- The delivery stage: This is the phase where the product is finalized and launched.

The stages adapted for the service design were the discovery, design definition and aspects of the development stage. This adaptation was necessary because the service design task was to conceptualize the service rather than develop the service. These phases helped in the conceptualization process.

The service design process were driven by two core tasks. The first task was to analyses the existing service. The process was dubbed "as is". The second task was to conceptualize the expected service. This process was dubbed "to be". The adaptation of the double diamond process were engrained in the development of these tasks as explained the following sections.

**The "As is" methodology**

The "As is" activities utilized mostly aspects of the discovery stage as indicated in figure 3.  The first activity was to identify the current businesses in each partner country. Based on this activity, the first set of challenges were identified. These includes the nuances in the business registration process and technical based challenges that mitigates against the delivery of cross-border G2B services. To dig into the dynamics of these challenges, investigations were made into the process and technical challenges identifies in the mapping process.

Discovery stage

- Mapping of Current business registration processes.

- Elicitations on the existing cross-border business registration process challenges

- Investigation into existing cross-border business registration process challenges
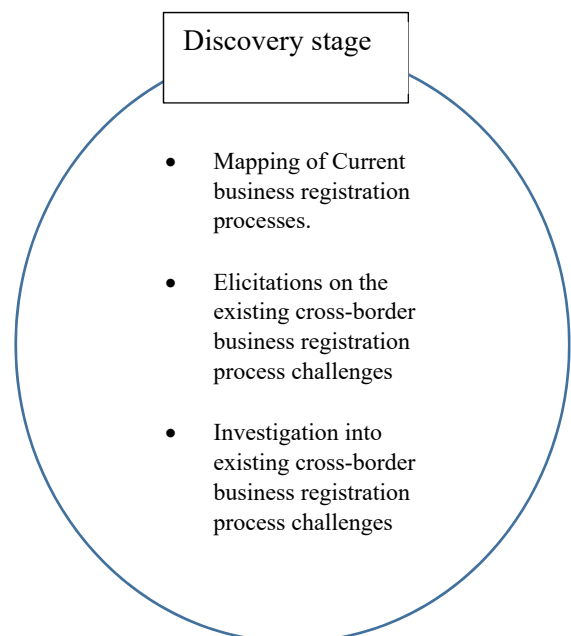
Figure 3: Discovery stage

These challenges are identified in the "As is" section in section 3.2.1. The methodology used in this process was a mixture of desktop research and additional formal and informal interviews with the afore mentioned supporting agencies.

The discovery stage was extended into the "to be" methodology.

**The "To be" methodology**

The "To be" activities utilized aspects of the discovery stage, the design definition stage and aspects of the development stage. These activities occurred in an iterative manner. The brief description of activities in each stage are as follows.

- The discovery stage: The discovery stage in the "to be" was a continuation of the discovery stage in the "As is". The focus was on the discovery of potential solutions towards improving upon the delivery of cross-border business registration service as identified in the "as is". The methods adopted in this stage were:

  o Consultation with the relevant personnel from the aforementioned external agencies. The aim was to identify ways the technical and the process challenges could be solved.

  o Consultation with national agencies implementing eIDAs on how technical issues on e-Identity and e-Authentication can be solved within the eIDAs framework.

  o Brainstorming sessions and experience sharing, between the partners in the showcase on the nature of the problem and how it could be solved. Here the experience and insight to EU regulation from the Norwegian and Lithuanian business registrars were very valuable at this stage.

  o Investigating previous EU and national projects aimed at solving the same problem to find out their deficiencies. But furthermore to gain inspiration on what worked and how it could be improved upon.

  The outcome of these activities was twofold.

- The accumulation of knowledge resources and insights into problems associated with attempts to solve the connectivity and process challenges identified earlier.
- The accumulation of knowledge resources and insights into the possible technical, process and service design solutions to these problems.

- The design definition stage: In the design definition stage, an attempt was made to identify the best service design solution that can solve the technical and process challenges identified. The identification process were as follows:

  - The first step to the process was the identification of the various stakeholders necessary for the service delivery process. This was needed to create the relevant personas.
  - The second step was the mapping of the "to be" customer journey. This is the mapping of the customer journey in the ideal or close to ideal online cross-border business registration process.

  The method for these activities included:
  - Brainstorming sessions

- The development stage: At this stage the blue print for the service was created. This process took into consideration the actions that would be performed, stakeholders that will be involved and, the technological sequence that will be needed in service delivery process. Different scenarios were suggested debated, discussed, described and sketched. The development of the scenarios were guided by the process, technical and legal challenges identified in the "As is" phase of the project.

## 3.2 AS IS PHASE

The member state contexts used in the evaluation of the "as is" phase are the Denmark, Norway, Lithuania and Estonia. This process began with the mapping of the current business registration process (see appendix 1). The main challenge identified here was the nuances in the business

registration processes in these countries and the uneven development of cross-border enabled business registration systems. The good news was that infrastructure aimed at enabling cross-border public service was being developed by some member states as will be identified in this section. The fact that member states were upgrading their national infrastructure led to the idea of not tampering with the national business registration infrastructure. This will be explained later in the "to be".

The other challenges identified were related to the applicant's identity and the language used for service delivery. More details on these challenges are also highlighted in this section. The challenge with identity led to the evaluation of the eIDAS implementation in these countries to identify the potential emerging challenges that could impede upon cross-border identity and transaction. There was a similar exercise aimed at evaluating the challenges posed by language. These evaluations are presented in this section.

The investigation into these challenges made alongside investigations into their possible solutions. Experts were consulted and inspiration was elicited from showcase partners whose countries have enabled some form of online cross-border business registration process. The solutions identified are also presented in this section and they are the basis for the solutions presented in the "to be".

Furthermore, an attempt was made to evaluate the state of interoperability of the existing business registration systems represented in the showcase. IMAPs was used for this purpose. The aim was to understand the current state of interoperability and to create a vision of the form of interoperability the intended service should provide.

### 3.2.1 Evaluation of the Current Cross-border Business Registration Process

In evaluating the "as is", emphasis was placed on four areas namely:

- The legal and technical aspects of the access (eID) infrastructure, which enables cross-border service delivery.
- The language used in the business registration process.
- The digital nature of the cross-border business registration process[3].

In order to conduct this exercise, the full cross-border business registration process in Denmark, Norway, Lithuania and Estonia were mapped. The outcome of this process is attached to this report

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[3] This involved mapping the business registration process to identify the aspects that were digital or otherwise.

as appendix 1. However, the relevant snippet relevant for each area of emphasis in the "as is" is presented here.

## THE "AS IS" EID INFRASTRUCTURE IN THE CROSS-BORDER BUSINESS REGISTRATION PROCESS

**Outcome 1: State of Cross-border business registration in Denmark, Norway, Estonia and Lithuania**

- **Denmark**

| Agency responsible | Danish Business Authority |
|---|---|
| Business registration platform | www.virk.dk |
| Platform eID and authentication | NemID |
| Cross border access to platform | Yes* |

**\*After filling certain either form 40122 or 40001**

The Danish Business Authority is the agency responsible for business registration in Denmark. National and cross-border business registrations are performed on a citizen centric platform accessed at www.virk.dk. Information on the platform are provided in Danish, German, Polish and English. Persons using the platform assess it using the eID called NemID. NemID is granted to persons who are resident in Denmark and own a CPR number. However, inorder to facilitate cross-border business registration, a non-resident EU citizen or any foreigner fills an online forms called 40.122 (service delivery) and 40001 (establishing of branches) and submits it to the Danish Business Authority. The agency will process their application and further grant them access to use Virk.dk when the applicant's NemID is ready. Once the company is registered, the Danish Business authority sends the company details to the Danish Tax Authority (SKAT). The company is further obliged to register with the Register of Foreign Service Providers (RUT) using NemID.

- **Norway**

| Agency responsible | The Brønnøysund Registration center |
|---|---|
| Business registration platform | www.altinn.no |
| Platform eID and authentication | MinID, BankID, Buypass, COMMFIDES |

| Cross border access to platform | No |
|---|---|

The Brønnøysund Registration center is the agency responsible for business registration in Norway. National and cross-border business registration is performed on a citizen centric platform assessed at www.altinn.no. Persons using the platform access it any of these Norwegian eIDs (MinID, BankID, Buypass, COMMFIDES). These eIDs are granted to persons living in Norway and own a D-number. Furthermore, cross-border business registration is not possible for persons who neither live in Norway nor own a valid D-number. Hence, without valid residence, it is not possible to register a company in Norway. In the case of limited liability companies, founders with roles in the company must have a D-number. Furthermore, in the case of a limited liability company, one of the founding partners must be a Norwegian resident with a D-number.

- **Estonia**

| Agency responsible | The Center for Registers and Information Systems |
|---|---|
| Business registration platform | www.rik.ee |
| Platform eID and authentication | Estonian, Latvian, Belgian, Finnish ID card; Estonian or Lithuanian mobile ID or Estonian e-Residency card |
| Cross border access to platform | Selective access* |

*Local address and an Estonian resident is required.

The Center for Registers and Information Systems is the agency responsible for business registration in Estonia. National and cross-border business registration is performed on a citizen centric platform assessed at www.rik.ee. Persons using the platform access it either with an Estonian eID, Latvian eID, Belgian eID, Finnish eID card, Lithuanian mobile ID or an Estonian e-Residency card. Hence, Estonia provides selective cross-border access to Lithuanians, Finland, Belgians, Latvians and any foreigner with the Estonian e-residency. Despite these selective access, Estonian law, just as the Norwegian law requires that one of the applicants or one of the co-founders (in the case of a limited liability company) be an Estonian resident. Currently Estonian service providers provide contact person services as well as virtual addresses for foreign companies. These enables companies to access the RIK platform.

- **Lithuania**

The Lithuanian Center of registers is the agency responsible for business registration in Lithuania. The register is an online platform that serve domestic Lithuanian companies. The platform is not equipped to provide access to non-Lithuanian residents.

Currently, Denmark and Estonia possess eID solutions that enables cross border business registration. However, the situation will change once eIDAS is adopted. eIDAS will enable access to the Danish, Estonian, Norwegian and the Lithuanian platform (which is still under development)[4].

**Outcome 2: Evaluation of eIDAS**

To further investigate the eID solution, the current implementation and potential for using eIDAS for business registration was investigated. Areas investigated were:

- The potential for the identification of Natural and legal persons
    - Natural and legal persons are identified by the attributes that accompanies their eIDs.
    - eIDAS provides mandatory and optional attributes which accompany the eID of Natural and legal persons. The mandatory attributes for natural persons are represented in the table 3 below.

Table 3. eIDAS Mandatory Attributes

| Attribute (Friendly) Name | eIDAS MDS Attribute |
|---|---|
| FamilyName | Current Family Name |
| FirstName | Current First Names |
| DateOfBirth | Date of Birth |
| PersonIdentifier | Unique Identifier |

Optional attributes include address, gender and any other attribute required by the national law needed to access the service. The mandatory attributes for legal persons are represented in the table 4 below.

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[4] Information Technology and Communication Department under the Ministry Of Interior is responsible for implementation of this project in Lithuania

Table 4. eIDAS Mandatory Attributes

| Attribute (Friendly) Name | eIDAS MDS Attribute |
| --- | --- |
| LegalName | Current Legal Name |
| LegalPersonIdentifier | Uniqueness Identifier |

Optional attributes include legal address, VAT registration, tax reference, business codes, Legal Entity Identifier (LEI), Economic Operator Registration and Identification (EORI), System for Exchange of Excise Data (SEED), Standard Industrial Classification (SIC) and any other attribute required by the national law needed to access the service.

- The current national Implementation approaches:
  - Norway: In Norway, incoming eIDs of natural persons will be stored in the national peoples register and mapped to a local social security number. This will enable the individual to perform transactions on the Norwegian public service platforms, including the business registration platform (Altinn).

  - Denmark, Estonia, Lithuania: Incoming eIDs of natural persons will not be stored in the civil registers. Rather, the applicant will have access to the intended service, in this case business registration and perform transactions permitted by the national law.

- The expected eID Authentication process
  - Denmark, Estonia, and Lithuania: Incoming eIDs are authenticated in their originating national systems before access is granted to the cross-border service.

  - In Norway, the authentication in the originating national system is made once. Subsequent visits will not require authentication from the originating system. The reason is that the incoming eID will be mapped to the civil register.

- The advantages of eIDAS
  - It enables the identification of both legal and natural persons.
  - Trust is based on the authentication provided by the national system of which the eID is domicile.

- The potential challenges with eIDAS
  - Insufficient attributes: As business registration, processes vary across member states, so do attributes needed to access the service vary. The mandatory attributes are not sufficient to enable an automated access to the service. The applicant will have to provide those additional attributes manually.

  - Double identity: certain natural persons possess more than one eIDs from different member states. This is as a result of free movement of persons within the EU to work. Inorder to work, the natural person needs a resident permit with an eID. Double identity is not a problem if there was absence of fraud. Persons with multiple eIDs who have committed fraud can easily hide their past. However, persons with multiple eIDs who may not have committed fraudulent activities could be disenfranchised if another person who bears the same name with multiple eIDs committed fraud.

  - Not a full proof identifier: In Scandinavia and other neighborhood regions people bear exact attributes. Being able to distinguish two person with the same attributes without seeing them can be daunting.

  - Matching of natural person with legal persons: one major interest for business registrars, especially in the establishment of branches is to verify that the natural person has the right to represent the legal person. Unfortunately, data from the transmitted eID alone is not sufficient to make such a verification.

- The potential solutions of the identified challenges

  - The Norwegian approach: The Norwegian approach of mapping the incoming eIDs to the civil register is one solution. This provide ample time that will enable the investigation of an eID and the background of the natural and legal persons.

  - The development of service attribute gateways: Member states can develop attribute gateways for their service. This gateway will broadcast the attributes needed to

perform a transaction with such a service. This will enable other eID providers to enrich the eIDs with attributes that will enable the natural person access the intended service.

EIDAS may not be perfect at the moment but it is sufficient. Furthermore it was a EU common eID standard, backed by the eIDAS regulation. It will facilitate the interoperability of the eIDs in Europe. Currently, Estonia was the only show case partner with a completed eIDAs implementation and a notified eID for natural persons. Denmark, Norway and Lithuania were at various stages in the implementation of their In addition eIDAS has great potential, especially when it is updated to solve some of the emerging problems. Hence, it was deemed sufficient as the eID solution for this showcase.

EVALUATION OF "AS IS" FOR LANGUAGE FOR CROSS-BORDER DELIVERY

As seen in the table below, different countries have adopted different approach towards the language being used for service delivery. Norway and Estonia has adopted the national language and English (a universal language). Denmark has adopted the national language, English (a universal language) and those of its close neighbors, Poland and Germany.

Table 5. Languages used to deliver cross-border business registration in Denmark, Norway, Estonia and Lithuania

| Country | Platform | Platform language |
|---|---|---|
| Denmark | www.virk.dk | Danish, Polish, German and English |
| Norway | www.altinn.no | Norwegian, English |
| Estonia | www.rik.ee | Estonia, English |
| Lithuanian | ● | ● |

Denmark, just as Norway also share borders with Sweden. Norway also shares border with Finland. Danes, Norwegians and Swedes can communicate among themselves due to their common history; hence, there is no need to translate their platforms into these languages. A part of Finland speak Swedish as well.

In order to evaluate if there is the need for translating the existing services into more languages, so as to cater for more European countries, different forms of e-translation were considered. These were:

- Manual translation of the service webpages
- EU E-translate tool provided by DG translate. The tool is available until 2020 when it will be commercialized.
- National e-translate tool
- Google translate

Manual translation was deemed effective but very expensive. It was not worth translating all service webpages to different EU languages. The EU translate tool was rated as good but it the quality of translation of some Norwegian words to English was not good enough. The national e-translate tool from Latvia was also considered in one of the WP4 seminars. The tool could not be evaluated because it could only translate three languages, Latvian, Russian and English. Google translator was also seen as not good enough.

The challenge in registering a business is that the applicant is dealing with national laws. Hence, it is important that the applicant comprehends what he or she is reading and that no meaning is lost in the tranlation. This was the reason for a critical review of the e-translation options available.

Hence, in finding a solution to the problem, the quality of translation as well as the cost of translation were identified as critical. In order to maintain the quality of translation, the national business registrars or their information provider should handle the e-translation of information on business registration. In order to save the cost of translation, translated information should be provided in English and one other EU language. The criteria for selecting the EU language should be based on the volume of business registration traffic emanating from that country.

## AS IS ON THE STATE OF DIGITALIZATION OF CROSS-BORDER BUSINESS REGISTRATION

As indicated in Appendix 1, the cross-border business registration process in Denmark and Estonia is digital. In Norway, cross-border business registration is digital, but only to persons with D-Number.

Table 6: Online status of Cross-border business registration

| Country | Digital status |
| --- | --- |
|  |  |

| Denmark | Online |
| --- | --- |
| Estonia | Online |
| Norway | Online* |
| Lithuania | Offline |

*Only with d-number

In Lithuania, different supporting infrastructures are being developed to facilitate cross-border service delivery in general. These infrastructure include the Register of Foreigners[5], e-resident[6] and eIDAS implementation[7] and the adaptation of e-services for foreigners or multilingualism (responsible each agency).

### 3.2.2 Evaluation of interoperability maturity phase using IMAPS
### A. Overview of IMAPS

The Interoperability Maturity Assessment of a Public Service (IMAPS) is the EU's benchmark for assessing the level of interoperability maturity of individual digital public services. The IMAPS approach to public sector interoperability is broad. It encompasses four dimensions, technical operational, semantic and legal interoperability.

- Technical interoperability: The ability of the national technical systems to interconnect and exchange data.
- Organizational Interoperability: The coordination of workflow between different national systems.
- Semantic Interoperability: The mutual understanding of data being transmitted based on ontologies
- Legal interoperability: these are national legislations that supports technical, and organizational interoperability.

IMAPS considers interoperability of national and cross-border public services. The IMAPs interoperability maturity level has 5 stages ranging from 1 (Poor interoperability) to 5 (ideal interoperability). The desired interoperability level is at least level 4. This is because all relevant best practices have been implemented for a public service.

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[5] Being developed by The Migration Department under the Ministry Of Interior
[6] Being developed by The Migration Department under the Ministry Of Interior
[7] Being developed by the Information Technology and -Communication Department under the Ministry Of Interior

The stages are represented in the table 7 below.

Table 7: IMAPS interoperability Maturity model

| Maturity level | Maturity stage | Interpretation |
|---|---|---|
| 1 | Ad hoc | Poor interoperability – the digital public service cannot be considered interoperable |
| 2 | Opportunistic | Fair interoperability – the digital public service implements some elements of interoperability best practice. |
| 3 | Essential | Essential interoperability – the digital public service implements the essential best practices for interoperability |
| 4 | Sustainable | Good Interoperability – all relevant interoperability best practices are implemented by the digital public service |
| 5 | Seamless | Interoperability leading practice – the digital public service is a leading interoperability practice example for others. |

Source: IMAPS user guide

**B. Interoperability maturity phase in the business registration process**

In an online cross-border business registration, there are two major processes, the frontend and back end process.

**Process1 (Front-end process):** The first process is the front-end process where the customer inputs the necessary information and documents to the destined national business register. Interoperability in this process can be examined between a national business registrar and an eID infrastructure provider. This form of interoperability is a critical aspect of an online cross-border business registration process. This is because it supports customer identification and authentication. Nationally each country possess their individual eIDs where they can identify and authenticate legal residents who intend to register their businesses. Hence, there is a seamless technical interoperability at the national level between the business register and the national eID infrastructure. Nevertheless at there is a challenge in the identifying and authentication of foreign eIDs. The foundation of the challenge is the lack of technical interoperability between the foreign eID provider and the national register. This challenge is as a result of national legal barriers. As examples, Norway, Lithuania and Estonia (to a certain degree) require legal residency of the natural person as a pre-requisite to the cross-border

business registration process. These legal barriers impede organizational interoperability (multilateral recognition of eIDs).

In the bid to solve the problem, Estonia had adopted a limited unilateral technical (STORK eID) and legal solution to facilitate the technical operability between their National Business registrar and selected foreign eID infrastructure. Hence, natural persons with either Lithuanian, Belgian, Latvian or Finnish eIDs can access and register their business in the Estonian Business Register[8] across border. Estonia has implemented eIDAS and has notified its eID scheme. This implies that natural and legal persons from other EU member states can now access the Estonian business register.

Conversely, Norway, Lithuania and Denmark hope to facilitate the interoperability between foreign eID schemes and their business registers when they notify their eID schemes. Although Denmark was not mentioned earlier as possessing a legal barrier to cross-border business registration, no other eID can be used to access the Danish business register. However, that will be possible with eIDAS.

Based on this insight, the IMAPs in the context of Cross-border interoperability between national business infrastructure and foreign eID infrastructure can be mapped.

## IMAPs Assessment of Process 1

**Pre- EIDAS Assessment**: This mapping ought to take into consideration legal, technical, operational and semantic interoperability. However, the only Pre-eIDAS cross-border e-ID to Business registrar interoperability, among the showcase partners, was found in Estonia and this was a technical interoperability. Hence, the IMAPs assessment focuses on technical interoperability.

Table 8: Pre – eIDAs interoperability assessment

|  | Maturity level | Maturity stage |
|---|---|---|
| Norway | 1 | Ad hoc |
| Denmark | 1 | Ad hoc |
| Lithuania | 1 | Ad hoc |
| Estonia | 2 | Opportunistic |

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[8] www.RIk.ee,

As explained earlier before the adoption of eIDAS, the Estonian business register had a fair technical interoperability with eID providers from Lithuania, Finland, Belgium and Latvia. The interoperability was not bilateral in all cases. As an example, Estonian's cannot access the Lithuanian Business register. This is why the maturity stage is identified as "opportunistic". Denmark, Lithuania and Norway are rated as "ad hoc" because there is no interoperability between the business registrars and foreign eIDs.

**Post E-IDAS assessment:** The post e-IDAS assessment is also based on the technical interoperability. This is based on the same reasons provided for the pre-eIDAs assessment.

Table 9: Post eIDAs interoperability assessment

|  | Maturity level | Maturity stage |
| --- | --- | --- |
| Norway | 1 | Ad hoc |
| Denmark | 1 | Ad hoc |
| Lithuania | 1 | Ad hoc |
| Estonia | 3 | Essential |

However, in the Post eIDAS assessment, Estonia's maturity level has gone up by one level. This is because; based on the EU e-Government policies and the Single Digital Gateway Regulation, the availability of a cross-border eID infrastructure enables the mutual recognition eIDs. This is obviously essential in the business registration process. This is why the maturity level is pegged at 3.

**Process 2 (back-end process):** The second process in the backend process where the business registrars process the applications. In this process, the business registrar may have reasons to request and share information with other business registrars. This would enable them conduct verifications on the data provided by the applicant or perform background checks if the applicant is applying to establish a branch of his or her enterprise. Interoperability at the back-end process is are either between national business registrars or between national business registrars and law enforcement agents.

**Cross-border Interoperability between national business registrars.**

Currently at the back-end process there exists some level of organizational, technical and interoperability between national business registrars in the Europe. The network of European Business Registrars (EBR) facilitates cooperation towards achieving limited organizational and technical interoperability among the most business registrars in the EU. The basis of the network is the EBR information sharing agreement. This is a Government-to-Government (G2G) where a Business registrar from one member state can request and access data electronically from other another member state. This network enables business registrars to conduct cross-border verification and background checks.

To facilitate this form of interoperability, EBR has been involved in projects such as BRITE. The dimensions of the project involved, technical, semantic and organizational interoperability between business registrars. An operationalized outcome of BRITE was the cross-border interconnectivity of national business registrars to deliver the branch disclosure service, the transfer of seat and a central company names index[9].

The EU has led other initiatives that resulted in technical, semantic and organizational interoperability of the EBR. A notable example is the development of the Business Registers Interconnection System (BRIS) by the EU commission. Technical, semantic and organizational interoperability was facilitated by the interconnection and facilitation of data exchange between national business registrars. This enables the national business registrars to communicate with each other further enhancing its verification abilities.

Although these cross-border interoperability scenarios exist, it is still not sufficient in solving some of the challenges in the verification process. Currently, there are still challenges in the verification of beneficial owners of companies and other similar challenges. The EBR has an interest in solving this problem. As a result they were represented the BOWNET project[10].Hence the need for this showcase. Based on this fact, the interoperability maturity stage of the showcase partners based on IMAP is deemed essential as indicated in the table 10 below.

Table 10: IMAPS Maturity Level for the back-end interoperability between National Registrars

|  | Maturity level | Maturity stage |
| --- | --- | --- |
| Norway | 3 | Essential |
| Denmark | 3 | Essential |
| Lithuania | 3 | Essential |

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[9] https://www.ebr.org/index.php/about-ebr/ebr-history/
[10] http://www.transcrime.it/bownet/

| | | |
|---|---|---|
| Estonia | 3 | Essential |

**Cross-border Interoperability between National Business Registrars and law enforcement**

A critical aspect of the verification process is the collaboration with law enforcement agent in other EU member states. Currently law enforcement agents do not have access to business registers in other EU member states. This makes the smooth mapping of business ownership by law enforcement agents challenging. The EBOCs[11] project is aimed at developing a cross-border infrastructure to solve this problem. Among the show case partners, the Estonian business register is involved in this project. Now, there is no cross-border interoperability between business registers and law enforcement. Hence, the interoperability maturity stage is ad hoc (1) as represented in the table below.

Table 11: IMAPS Maturity level for the back-end interoperability between National Registrars and law enforcement

| | Maturity level | Maturity stage |
|---|---|---|
| Norway | 1 | Ad hoc |
| Denmark | 1 | Ad hoc |
| Lithuania | 1 | Ad hoc |
| Estonia | 1 | Ad hoc |

Based on the evaluations made on the front end and back end process in the business registration process, the state of cross-border interoperability in the participating showcase is generally low (ad hoc). Estonia has shown some promise in enhancing cross-border interoperability on the front-end, hence it stand out. However, with the implementation of eIDAs, by the other member states, the gap will close eventually. At the back end, there is greater interoperability. However, more still needs to be done with respect to verification. Furthermore as mentioned earlier with respect to eIDAs, the inability to deal with double identify will result in more challenges.

## 3.3 TO BE

Based on the challenges and potential solutions identified in the "as is", a vision for the cross-border service is crafted in this section. The solution places emphasis on the potential for facilitating cross-border business registration using eIDAS. This emphasis is the basis for the development of the "to

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[11] EBOCS is a project to assist law enforcement agencies to access and map business ownership. However, the business registers from Estonia, Spain, Romania, and Italy in collaboration with EBR are part of the EBOCs project.

be". The accepted vision for the service is a centralized platform, which hosts a middleware that will facilitate cross-border service delivery. The centralized platform will provide the possibilities for performing direct cross-border transactions between the user and the business registrars using eIDAS. The centralized service is also expected to be a customized service, developed based on the requirements highlighted in this report. It will also provide a search possibility as will be described in this section.

The tasks performed and documented in this section include:

- The development of Epic (a story depicting the greater vision) , user stories (story subsets of that vision) and acceptance criteria (steps on how the vision should work)
- The develop the "to be" customer (process) journey
- An explanation on how the solutions identified in the "As is" come together in the customer journey process
- The develop scenarios for the service delivery process
- Potential interoperability maturity of the "to be".

### 3.3.1 Epics and User stories

The vision of the "to be" is based on two Epics. These epic provides an overall idea of the two service possibilities of the platform. These are:

Table 12. Epic, User stories and acceptance criteria

| Epic | User stories | Acceptance criteria |
|---|---|---|
| As a company owner, I need to register my company in another member state on a single portal, So I can establish a branch | As a company owner, I need to select an EU member state, so I can Register my company or a branch of my company in that country | The user should be able to<br>- Select a country<br>- Log in with eIDAS<br>- Select language<br>- Fill in the forms<br>- Upload additional documents<br>- Make payment<br>- Submit forms |
| | As a company owner, I need to abort a transaction with one member state, | The user should be able to<br>- Log out with eIDAS |

| | | |
|---|---|---|
| | so that I can register my business or a branch of my business in another member state. | <ul><li>Navigate to transaction page</li><li>Select a country</li><li>Log in with eIDAS</li><li>Select language</li><li>Fill in the forms</li><li>Upload additional documents</li><li>Make payment</li><li>Submit forms</li></ul> |
| | As a company owner, I need to select a switch to perform a search after a transaction, so that I may register my business or a branch of my business in another EU member state. | The user should be able to, at the end of a transaction.<ul><li>Navigate to search page</li><li>Select a country</li><li>Select language</li><li>Type in search</li><li>Read feedback</li><li>Print feedback</li><li>Save feedback</li><li>Download feedback (if possible)</li><li>Conduct another search (if the user wants to)</li></ul> |
| | As a company owner, I need to abort a transaction to perform a search, so I may acquire more information for the business registration transaction I intend to perform. | The user should be able to do two things.<br>1.<ul><li>Navigate to search page (the user will lose data)</li><li>Select a country</li><li>Select language</li><li>Type in search</li><li>Read feedback</li><li>Return to log in for transaction</li></ul><br>2. |

| | | |
|---|---|---|
| | | • Open another tab (the user will not lose data)<br>• Click on the search menu<br>• Select a country<br>• Select language<br>• Type in search<br>• Read feedback |
| | As a company owner, I need to end the transaction, so I can do other things | The user should be able to<br>• Log out with eIDAs |
| | As a company owner, I have forgotten to log out, I need to attend to an emergency | The system should be able:<br>• Log out the user after a period of inactivity. |
| As a user, I need to search for company registration information from other member states, so I can make an informed decision on where to register my business. | As a company owner, I need to select an EU member state, so that I may know about their business registration procedure in another EU member state | The user should be able to<br>• Select a country<br>• Select language<br>• Type in search<br>• Read feedback<br>• Print feedback<br>• Save feedback<br>• Download feedback (if possible)<br>• Conduct another search (if the user wants to) |
| | As a company owner, I need to select a switch to perform a transaction after a search, so that I may register my business in another EU member state | The user should be able to, at the end of a search<br>• Navigate to transaction page<br>• Select a country<br>• Log in with eIDAS<br>• Select language<br>• Fill in the forms<br>• Upload additional documents<br>• Make payment<br>• Submit forms |

### 3.3.2 Customer Journey

In developing the customer service journey, the user stories were used. Furthermore, the existing customer service journey in Denmark, Norway, Estonia and Lithuania were also considered as summarized in section 2. As mentioned earlier in the section 2, similarities were identified in the midst of the nuances in the service delivery process in each member states. Hence based on the brainstorming sessions the consensus customer journey arrived at were the service awareness, service consideration, service adoption, service processing and the feedback stages. The compromise cross-border customer journey is as presented in the figure below.
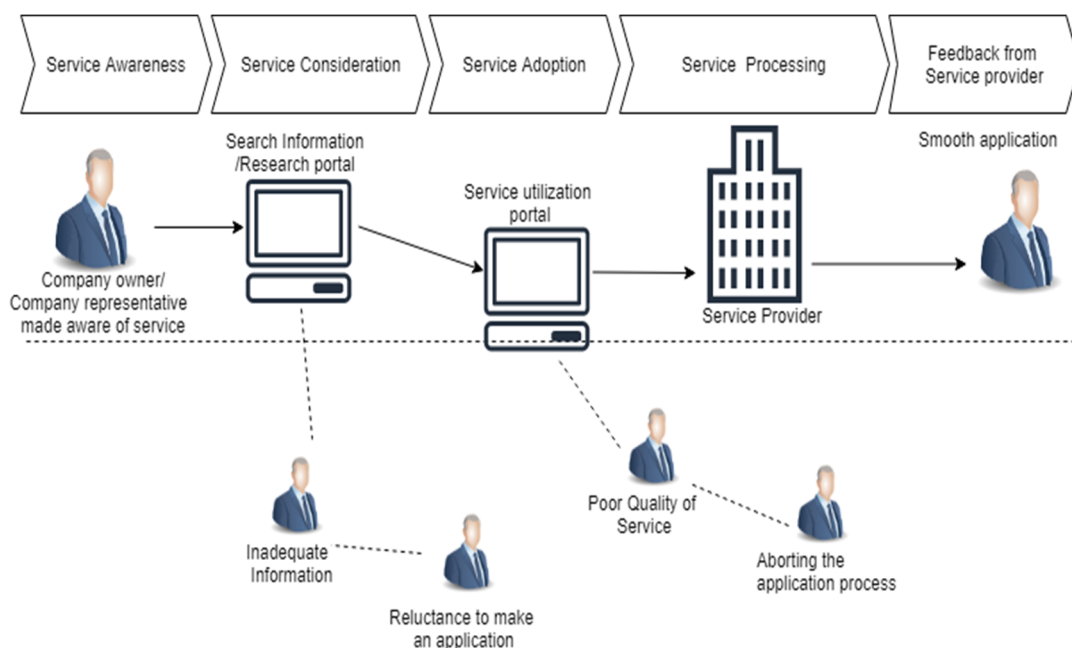


Figure 4: Proposed customer journey

The service awareness implies the representative or owner of the company is being made aware of the existence of a service that can facilitate cross-border business registration service. The service consideration stage is the phase where the company representative or company owner can consider the business registration options available to him or her in each EU/EEA member state. The service adoption stage is the phase where the company owner or company representative actually makes a choice and proceeds to register his or her business in the EU/EEA member state. The service processing stage is handled by the National Business Registrars. The feedback stage is the phase where the company representative or company owner receives feedback from the service provider. The service provider here is the business registrar in each EU/EEA member states.

In the customer journey experience, emphasis was placed on potential user experience in the business registration process as seen in figure 4. There were considerations on issues that may result in a positive or negative user experience. Issues identified that would result in negative user experience include inadequate or incomplete information at the service consideration stage and poor quality of service at the service adoption stage. These negative issues could pose as threats resulting in the reluctance of the company owner or company rep to use the platform at the service consideration stage. These threats could also result in the abortion of the application process if they experience poor quality of service at the service adoption stage. Hence, dealing with these threats were paramount in the development of a solution to the problem.

Conversely, issues identified that would result in a positive experience for the company representative or the company representative were:

- The existent of adequate information on one platform detailing the requirements needed to register a business in an EU/EEA member state.

- The possibility of conducting an error free, time saving, business registration transaction in any EU/EEA member state on one platform.

The possibility to receive feedback on the same platform on the progress and finalization of the business registration process. Thoughts on how the positive experience could be generated in the customer journey experience is explained in the next section.

### 3.3.3 Incorporation of the potential "AS is" into the customer journey

In order to facilitate a positive customer journey experience, the proposed cross-border service ought to be efficient and easy to use. In order to provide efficiency and ease of use, the solutions identified in the "as is" were incorporated in the customer service journey. In the "as is", three major issues were identified. Cross-border access, language and interoperability. eIDAS was identified as a solution for access and there was a suggestion for solving the language problem. The showcase partners agreed overall that eIDAS will facilitate cross-border access for the "as is" service and the

language solutions proposed will enable any customer from any EU member state to read understand and adopt the service.

However, an aspect that was not dealt with in the "as is" section was the problem with timesavings and ease of use. Currently the customer has to visit several places to shop for information at the service consideration process. Furthermore, he or she also has to visit individual platforms of different business registrars in order to perform a transaction. What if it were possible for the customer to access the different national business registrar, using one platform. There he or she could access the relevant information, make an informed decision and then proceed to make a transaction which will be pushed to the infrastructure of the national register. This will make the user stories a reality. That possibility was seen as a possibility if eIDAS attribute gateway, which was mentioned earlier in section 3.2.1, are implemented by the member states. How this would work is explained in the next section - service architecture.

In order to implement this time saving suggestions, then there is a need for an eIDAS enabled centralized broker. The broker will be hosted on a platform, which will serve as an interface between the customer, and the national business registers. If this idea is incorporated into the customer journey, then the customer journey will then be as presented in figure 5 below.
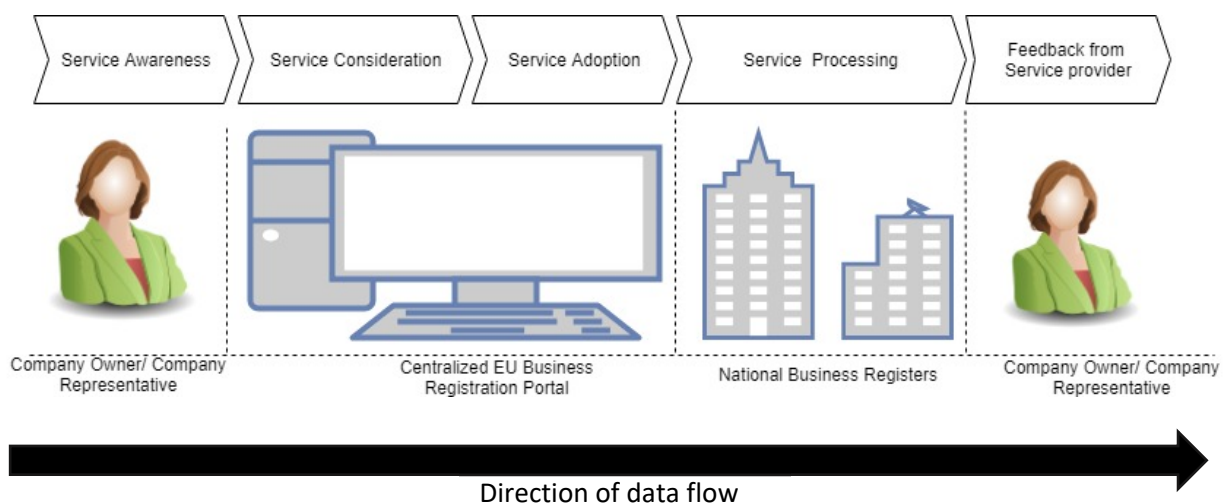


Figure 6. Customer journey for Cross-border business registration

In the data flow framework as seen in the figure 6, the first step is to make the company owner/company representative aware of the service. Currently there are online information agencies, national contact points and third party private sector providers that provide awareness on the business registration procedure in each member state. In this showcase, these set of stakeholders are identified as agencies that will promote the platform as well in various member states.

Once the company owner or company representative is aware of the platform, the next step is the decision to consider and adopt the service. At this stage, the service consideration and service adoption stages are merged into one platform. The service consideration is enabled by a search function while the service adoption is the actual cross-border business registration. Both stages are delivered via the centralized platform hosting the centralized broker. The platform as mentioned earlier serves as an intermediary between the company owner/company representative and the business registration infrastructure of the member state. The search component of the centralized platform infrastructure enables the company owner/company representative to access information about the business registration requirments in each member state. The business registration (reffered to as transaction in this document)  section enables either the company owner or company representative to register their business in any member state. Hence it is the transactional bit of the platform. This implies that the registration of legal persons can occur across-border online, without the person being present in the destined member state. The centralized infrastructure in the customer journey experience, enables the company owner or or company representative to consider as well as adopt the service. At the end of the application processing phase, the application is forwarded for processing. The consensus among the showcase partners was that the national business registrars should control how the application will be processed based on national laws. Furthermore, the modification of the national business registration infrastructure should be performed at the discretion of the member states.

The final stage is feedback stage. At this stage, the company owner/company representative should receive an electronic feedback. The next section describes the technical aand process description of each phase of the customer journey is described in the next section.

### 3.3.4 Service architecture of the "To be" scenario

SERVICE AWARNESS

There is no service architecture at this phase of the customer journey.

SERVICE CONSIDERATION AND ADOPTION PROCESS

At the service consideration and adoption phase, the customer acceses the service via a centralized broker as seen in the figure below. The centralized broker is a middleware consisting of message broker software for transaction purposes and a context broker for search purposes. The middleware is driven by a combination of Artificial Intelligence and machine learning as will be described later. The middleware software is interfaced with the business registration infrastructure of the members states. This is expressed in the figure 7 below. The proposed middleware is not an off the shelf middleware but one developed based on specifications of the national business register.
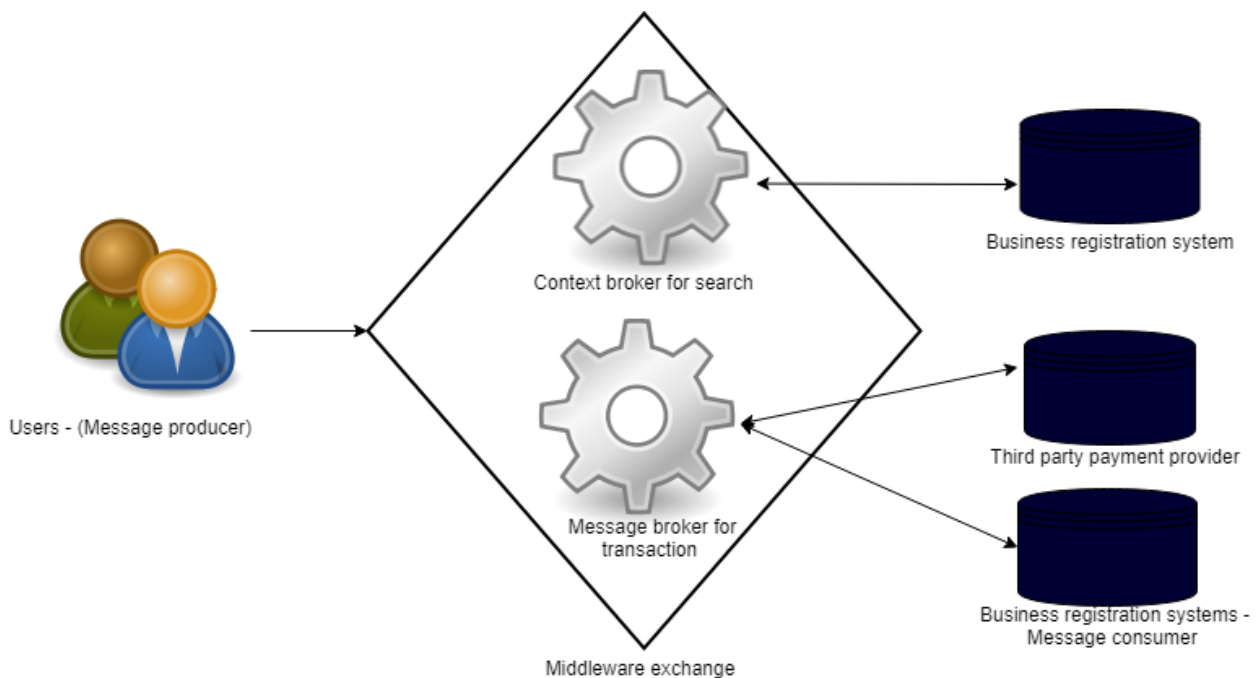


Figure 7: Conceptual design of the interaction between the user, broker and national business registration systems.

## A. Overview of the Middleware

This is how the middleware works. The customer interacts with the broker via a web portal. This is represented in the figure 8 below. The central broker is an unmanned, hosted centrally and it functions independently and intelligently as programmed. In principle it is an Artificial Intelligence enabled platform, supported by machine learning algorithm. This is explained later in this section. With the centralized broker, the customer is able to search for relevant infromation from different member states. This enables the customer to make an informed decision. The customer is also able to perform business registration transactions using eIDAS. The search function caters for the service consideration and the transaction function caters for the service adoption bit.
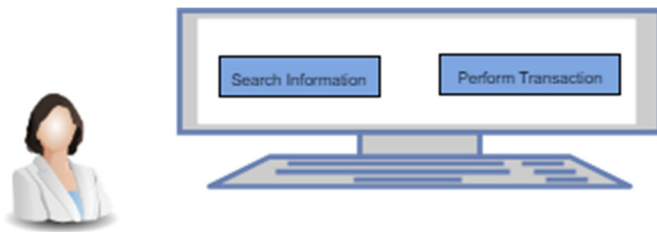


Figure 8: Conceptual representation of the core functions of the service interface

The flow chart below explains how the service consideration and adoption phase works. As seen in the flowchart, the customer visits the webportal hosting the centralized broker. The customer has two options, the search and transaction options.

There are three scenarios in which the user will use the search function.

- **To decide where to register**: If the customer is in doubt of where to register the company or how to do so. In this case he or she either types in the name of the country or select it from the dropdown menu. Information from that country is displayed. The customer studies the information based on the links provided. If he is satisfied with the information he has, the then proceeds to the transaction page. There he selects the country of his choice, logs in using eIDAS and performs the needed transaction. When he is done with the transaction, the information provided is pushed to the relevant national Business regitrars for processing.

- **To verify information**: If the customer intends verify crucial information on the business registration procedures of certain countries.

- **To window shop**: If the potential customer is planning to register a business in future or just wants to know abou the process, the person can use the search function.

There are also two scenarios in which the user will use the transaction function.

- If customer is already knowledgable about the business registration procedure in the intended country.
- If the customer is not satisfied with the information he or she has but still intends to invest in the intended country.

In both cases, the customer will select the target country and log in via eIDAS to perform the transactions. The customer does not need eIDAS to perform a search, as indicated in the user story in section 3.3.1. Once the transactions are completed, the data is parsed to the national business registrar for processing.
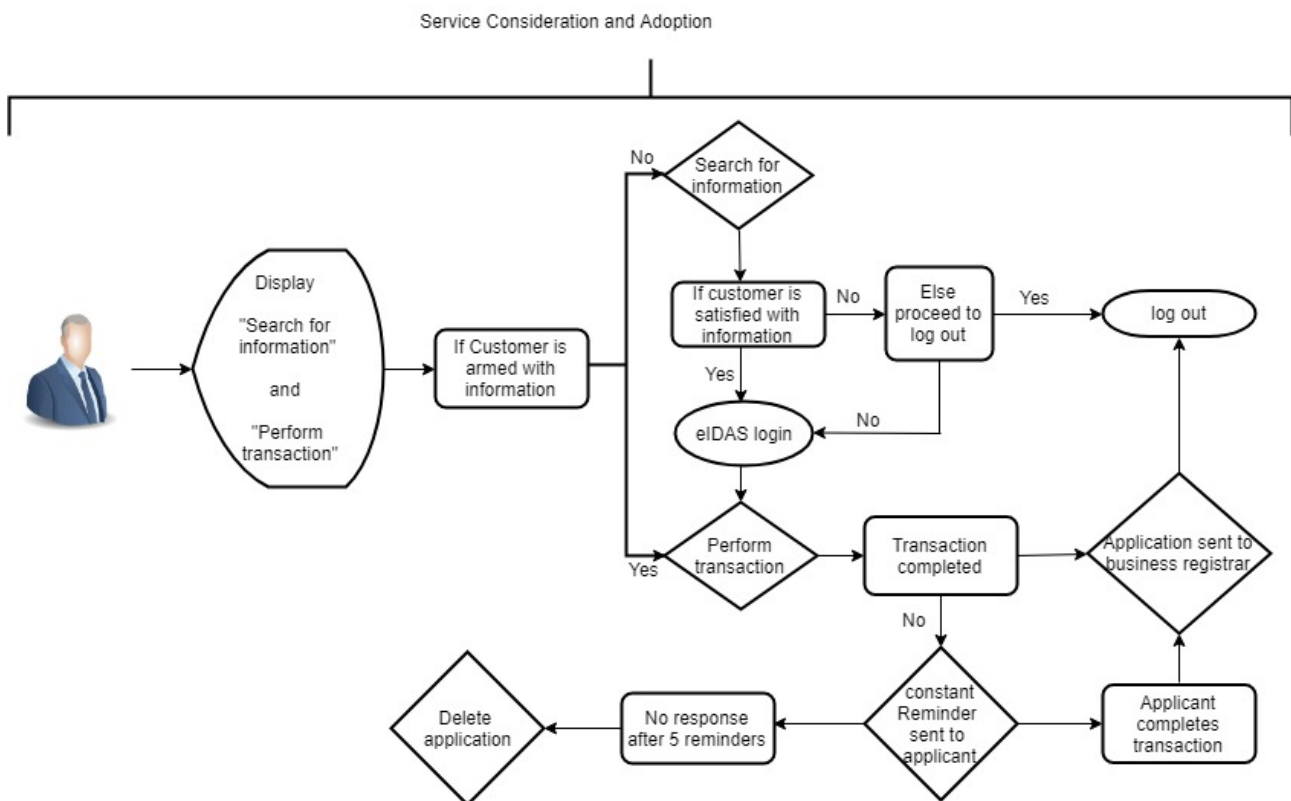


Figure 9: Service trajectories in the middleware

As seen in the flowchart, there is the possibility that a customer starts an application but does not complete it. The centralized broker using the email attributes in the customer's eID will send constant reminders to the applicant. Once the applicant performs the transaction, the application will be forwarded for processing. If the applicant does not respond after five reminders, the application is deleted. The applicant has to start afresh. Now lets discuss the technical details

**B. Technical architecture the centralized broker**.

As mentioned earlier, a centralized broker is proposed for the service consideration and adoption stage. The centralized broker has two aspects, the front-end and the back-end. At the front-end, the customer (the message producer) is able to search for relevant information as well as register their business online. At the back-end, the business registration infrastructure (message consumer) is able to push information and as well as pull data as requested the customer. This works for the search and transaction functions.

**Search function**: The search function, as shown in the figure 10 below, is performed with the help of a context broker which regularly caches information from the national business registrars and information operators. The context broker functions with the aid of maching learning which enables it to sort contextualize Big data. Based on the sorted data, the machine can interact with the customer during the search process. Nevertheless, if a customer needs information from Lithuania, the customer will either perform a search for Lithuania or select Lithuania from a drop down menu. A search query is generated and sent to the context broker which will provide the cached feedback on Lithuania. The cashed information will be from the Lithuanian center of registers periodically by the context broker. With the context broker, the customer can perform as many searches as possible on any country. This enables the customer to access the relevant information necessary to make an informed decision on the national business registration requirements. It enables the customer to compare and contrast , on one platform, the pros and cons of registering their business in one particular country.
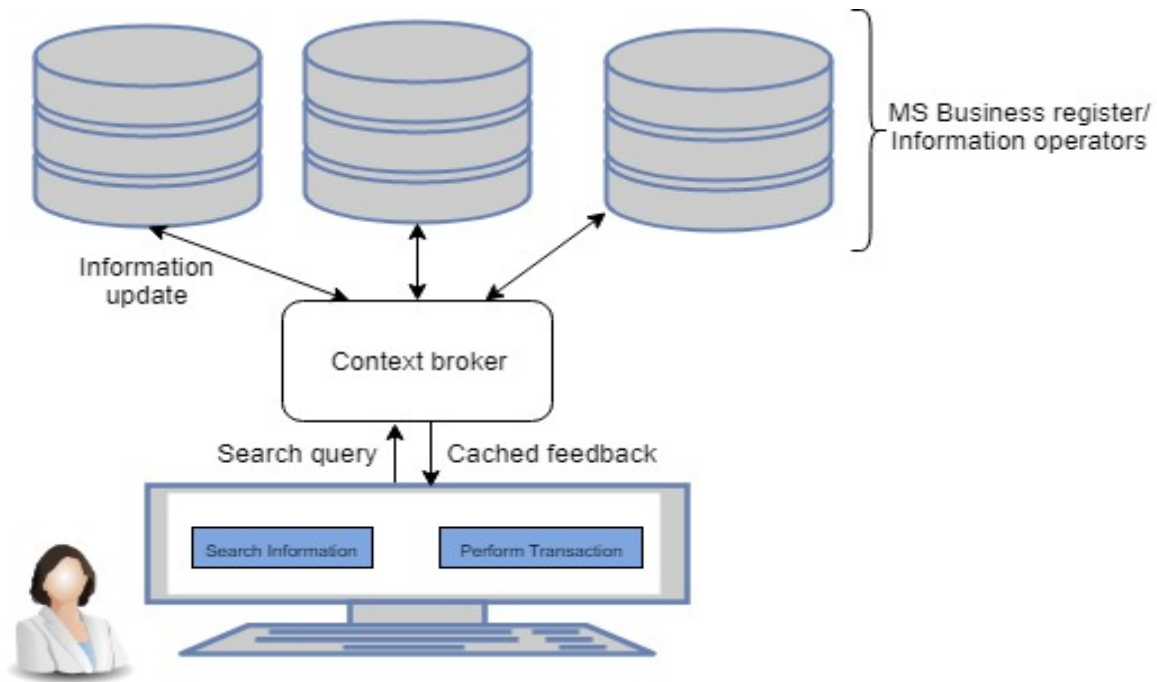
Figure 10: Search funtion infrastructure

The search aspect of the centralized broker or platform does not require loging in with eIDAS. However, the context broker will prompt the customer to select the language he or she hopes to access the information. The language options will be based on the language possibilities provided by the service provider (member state). In this showcase, the proposal, is that such options should be English, the national language and one other language. It is the assumption that most customers will understand English.

**Transaction function**: The requirements for this function is explained in section 2. Nevertheless, to facilitate the transactional flow, the transaction function, unlike the search function, requires direct access to the national business registration infrastructure. Hence the access with eIDAS is required. The proposed centralized broker is a message broker that is interfaced with the national business registration infrastructure using an Application Progamming Interface (API). These APIs are eIDAS service attribute gateways which announce the attributes needed to fulfil the Identity requirements for the legal and natural persons. This is represented in the figure 11 below.
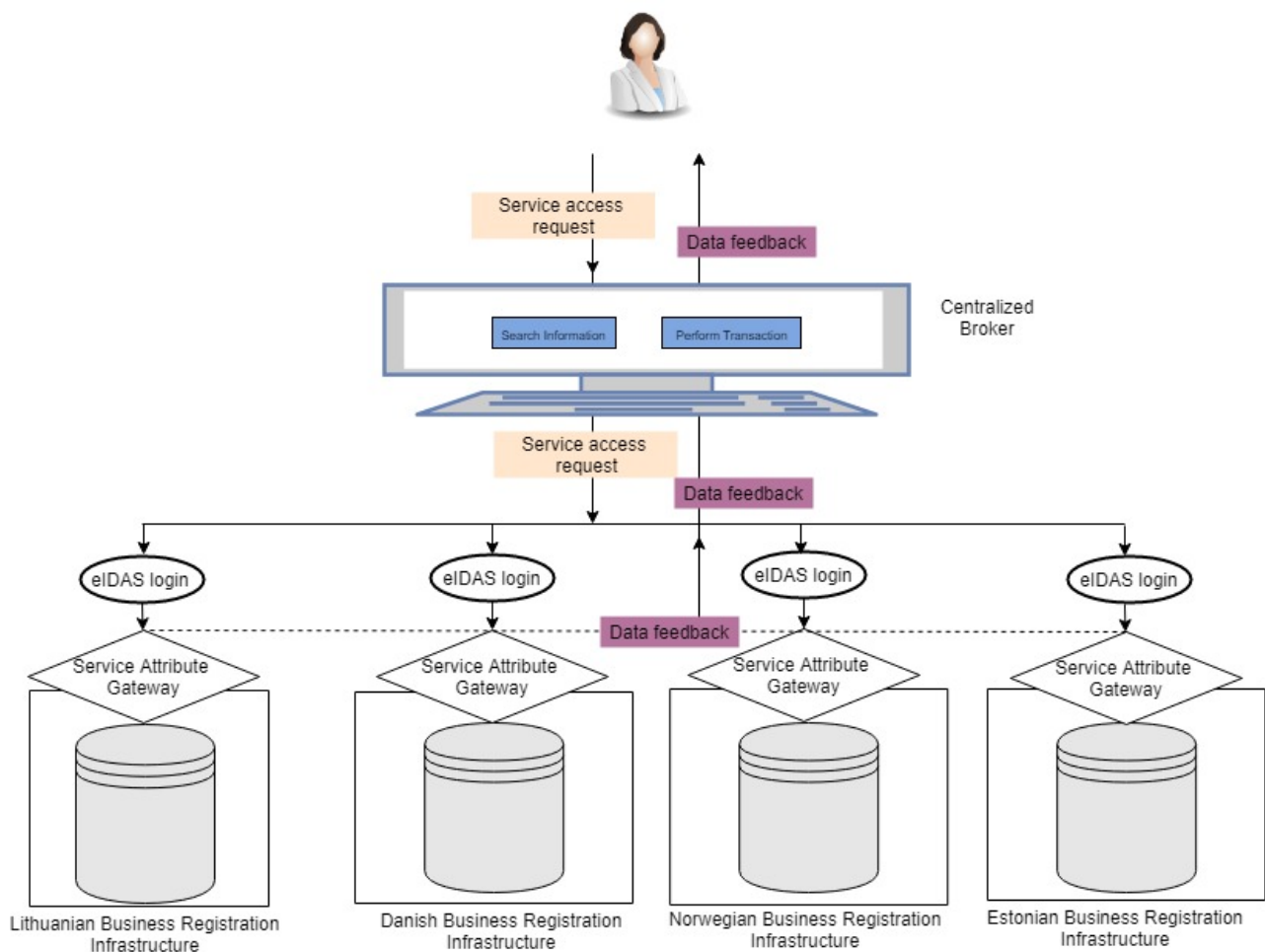
Figure 11: transaction funtion infrastructure

The service attribute gateway is enriched with the required eID attributes required by the national law inorder to register a business enterprise. They atribute gateway announces the service attributes to notified eID providers in another member state. So that a customer from each member state accessing another business register would arrive at the login interface with an eID enriched with the needed attributes to register their business. This will result in prefilled formed further facilitating ease of use for the customer based on the transactional flow as shown in figure 9 above. As a contigency plan, it was agreed that eIDs that are not enriched to perform transactions should not be excluded from doing so. Rather they should be able to fill in additional details in the online forms provided.

To enable these processes, then This will be handled by the eID providers in each member state. This requires that national eID gateways are interconnected. This also will enable eID service attribute

gateways in member states to be interconnected. Furthermore it will enable the matching of information when the applicant is filling the forms as will be described in the next few paragraphs.

However information push occurs when the customer fills the requisite form and submits it. Information pull on the other hand is facilitated in two ways. The first is when the customer logs in to perform a transaction in a particular member state, the necessary forms and mode of payment needed to business registration are pulled from the business register's infrastructure. This is represented in the figure below.
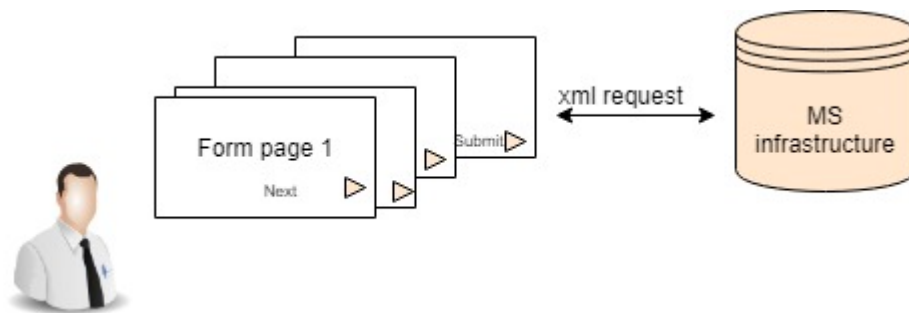


Figure 12: Forms pull and push request during transactions

Once the customer has provided all the details and facilitates payment, the filled forms are pushed back to the relevant business registration infrastructure as shown in the figure 12 above. The second is a background search process which occurs when the customer is filling in the company details. The search process involves the search of the databases of other business registration infrastructure across border to pull the customer's inforomation which can be reused. As an example, when registering the branch of a company, the address of the headquaters of the business might be required. Rather then the user having to retype it, that information can be pulled from the relevant national register and reused. The re-use is enabled by the interconnectivity of the eIDAS national gateway and attribute gateway to that of the business registers.

However, information pull does not benefit the customer alone, the business registrar also benefits as well. This is because, it is the interest of business registrars to verify the actual company owner. Hence, during the registration process if the system identifies that there are persons with similar names in other countries who have registered a company, it will prompt the customer to verify if those names refer to him or her. The feedback can help business registers in mapping businesses and dealing with double identity.

**Architectural overview:** The combined architechtural overview of the search and transaction process is presented in the figure below.
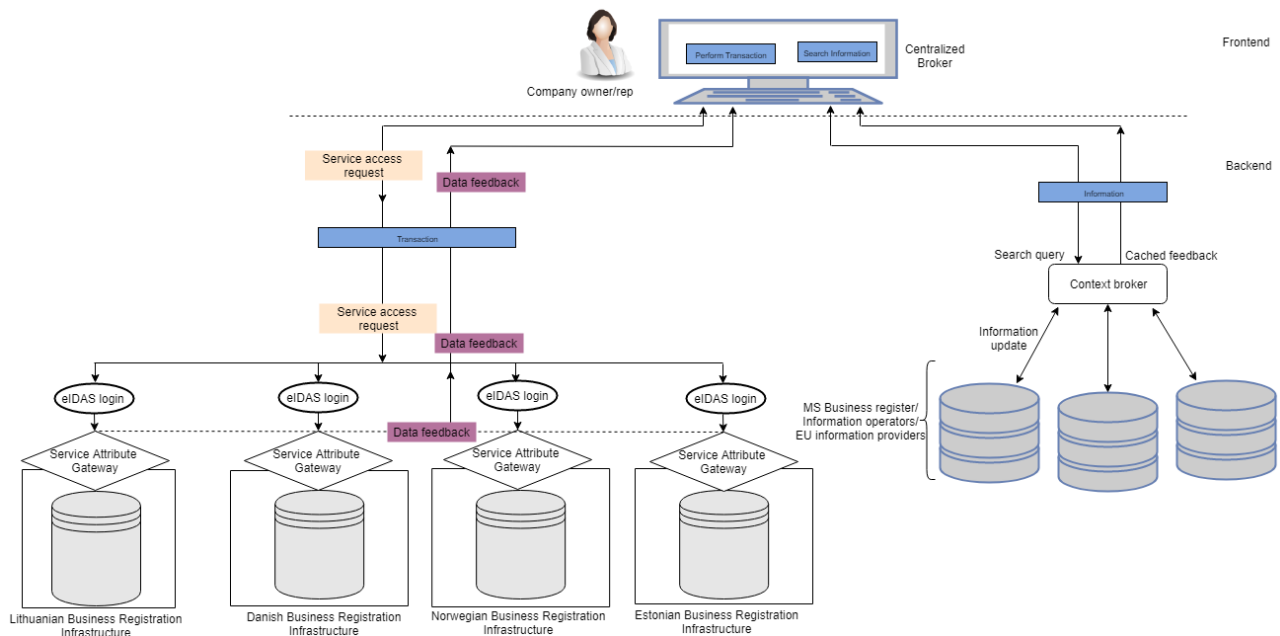


Figure 13: Service architecture for the showcase

<u>SERVICE PROCESSING AND FEEDBACK</u>

This aspects of the service architechture will be handled by the business registrars infrastructure as mentioned earlier. There was no attempt to modify processes here.

### 3.3.5 Simplified service architecture and user scenario

In order to create scenario, the architectural overview was simplified. This is represented in the figure 14 below. The search process and transaction processes are generally reffered to as transactions in this scenario. Furthermore, some member states such as Estonia are automating their business registration process to function intelligently and independently. While other member states will still have some human control over the business registration process, even though some form of automation could be adopted. This is taken into consideration.

As a refresher, the centralized broker intelligently pulls, pushes and matches data during the business registration process and the the information search process. In the simplified scenario, it is called the EU business registration connector. That is because it connects the remote user to multiple business

registers in different member states simaultenously,even though transaction functions are performed directly with one member state. This fact is also taken into consideration.

Based on this backgroud a scenario is created where a customer is able to perform cross-border business registration using eIDAS.
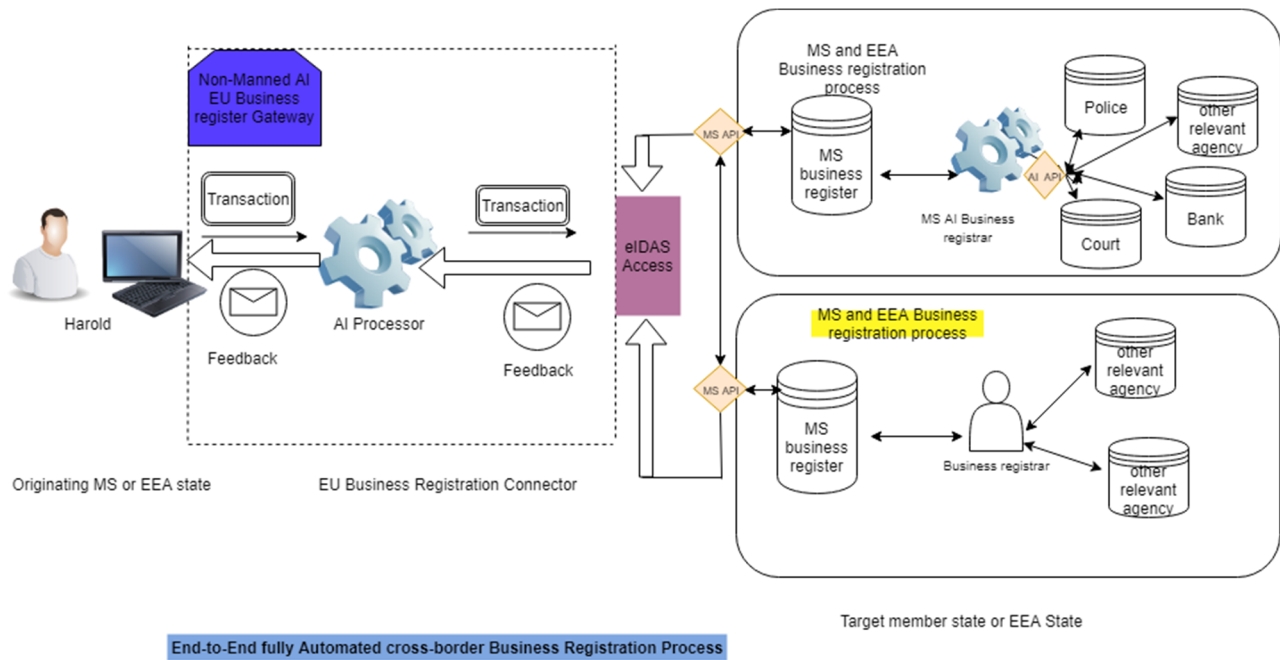


Figure 14: simplified service architecture

Three hypothetical examples can be used to explain the scenario in the figure above.

The persona is a hypothetical character called Harold, a citizen of Norway.

Secenario 1.

- Harold from owns a Norweigian limited liability company that exports software solutions to clients in various European countries. He intends to establish a branch of his company in Spain.
- He conducts a search on the EU business registration connector about the business registration process and requirements in Spain. He is satisfied with the information gathered.
- He opens an account in Spain and pays in the share capital.
- He then logs into the EU Business registration connector using eIDAS to register his business. He is connected to the business registration platform in spain.

- The connector reqeusts the relevant business registration forms and payment API from the Spanish business register, Colegio de Registradores. The forms are available in Spanish, English and one other language. Harold selects the forms avilable in English.
- He fills the forms, uploads the relevant documents, pays the payment processing fee and submits the forms. The forms are submitted to the the Spanish business register, Colegio de Registradores.
- In Spain, the online business registration infrastructure is manned. The personnel in collaboration with other relevant agencies (with technical operable infrastructure) process his application.
- Feedback is sent to him at the end of the process.

Senario 2

- Harold also intends to start a new shoe factory as a limited liability company. But he does not know in which country the shoe factory should be located.
- He prefers a country with less rigid business registration procedures. He conducts a search on the EU Business registration connector. After making a comparative analysis, he feels Estonia should be the destination. This could be because Estonia has deffered the share capital deposit, which implies he can open a bank account after the registration is complete.
- He then logs into the EU Business registration connector using eIDAS to register his business. He is connected to the business registration platform in Estonia (RIK).
- The connector reqeusts the relevant business registration forms and payment API from the Estonian business register, RIK. The forms are available in Estonian, English and one other language. Harold selects the forms avilable in English.
- He fills the forms, uploads the relevant documents, pays the payment processing fee and submits the forms. The forms are submitted to the the Estonian business register, RIK.
- In Estonia, the online business registration infrastructure is not manned. It is an AI controlled process.
- His application is processed in collaboration with other agencies who either have adopted or are yet to adopt AI.
- Feedback is sent to him at the end of the process.

Scenario 3

- Harold wants to operate an ecommerce venture as a sole proprietor. He has realized potential demand for his products in the Baltics. He wants to establish a presence in one of the Baltic countries. But he does not know where.

- He conducts a search on the EU Business registration connector. After making a comparative analysis, he feels Lithuania should be the destination. This could be because Lithuania does not require proof or residence for ecommerce stores. They require trust the home address attribute attached to the eID.

- He then logs into the EU Business registration connector using eIDAS to register his business. He is connected to the business registration platform in Lithuania (Lithuanian Center of registers).

- The connector reqeusts the relevant business registration forms and payment API from the Lithuanian Center of registers. The forms are available in Lithuanian, English and one other language. Harold selects the forms avilable in English.

- He fills the forms, uploads the relevant documents, pays the payment processing fee and submits the forms. The forms are submitted to the Lithuanian Center of registers.

- In Lithuania, the online business registration infrastructure is manned. The personnel in collaboration with other relevant agencies (with no technical operable infrastructure) process his application.

- Feedback is sent to him at the end of the process.

In each scenario, the feedback process will vary from one country to the other.


**3.3.6 Potential Interoperability maturity of the "to be" using IMAPS**

If the solution is implemented across the EU and EEA, it will result in the IMAPS maturity level 4. This is because sustainable technical, operational and legal cross-border interoperability between different national systems and their cross-border equivalents will be achieved. The sustainable cross-border interoperability will exist between the eID infrastructure in the country where the request for access is made and the country where access is granted. It also implies the indirect interoperability between the eID infrastructure where the request originates from and the national business register as seen in the figure 15 below.
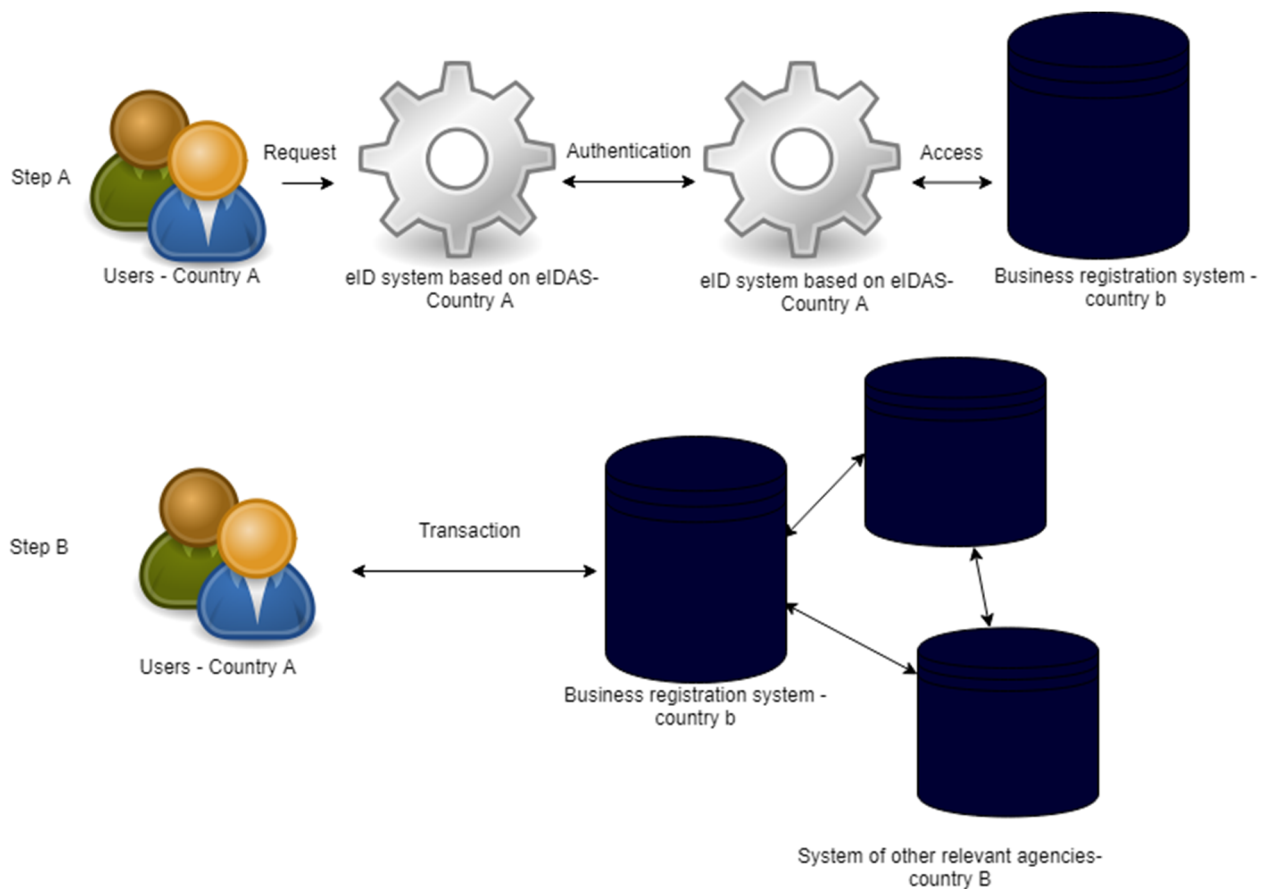
Figure 15: cross-border eIDAS – business registrar interoperability outlook

This sustainable interoperability enables the user in one country to have direct access to the business registration infrastructure and indirect access to the systems or the relevant agencies as shown in step b in the figure 15 above.

Seamless interoperability (maturity level 5) would work in a different context. That is neither the context of the showcase nor what the infrastructure proposed is aimed at. Howeever, in such a context, there would be a European business register, governed by no other law but national law but the EU business law. In that scenario, every business register will operate under one continental business registration process and the EU connector would be a seamless system that is compartmentalized rather than interconnect with other national business register.

# SECTION 4. SERVICE IMPLEMENTATION MODEL

The section provides an insight into the potential for the delivery of the service. The service model canvas is used as a guide to model toward the potential organization, and implementation of the service. An overview of the service canvas model is presented in the next page. In this section, a detailed explanation of the contents of the service model canvas is provided.

The original vision for the service was to create a seamless cross-border business registration service enabled by eIDAS in the EU. That vision was modified to facilitate the delivery of efficient cross-border business registration process in the EU.

In order to fulfil the vision, considerations were made on the key service activity; service delivery process; service infrastructure development and sustenance possibilities; Service stakeholders; Service target; cost of service delivery, expected benefits and the market value of service. Let's highlight them one by one using headings from the service canvas.

## 4.1 KEY ACTIVITY

- The main activity performed with the service is the facilitation of market entry for businesses in Europe.

## 4.2 SERVICE DELIVERY PROCESS

- Customer journey: As discussed earlier, the customer journey begins with, service awareness, service consideration, service adoption, service processing and ends with the feedback from the service provider. The progression from service awareness to service adoption is driven by sustained positive interest by the customer as he or her progresses through the process.

- Ways of service: In order to serve the customer, the business registers from each member state will provide the following:
    - Information on the business registration requirements from each member state.
    - National online business registration application and transaction platform.
    - Digital feedback mechanism on their application.

## 4.3 SERVICE INFRASTRUCTURE DEVELOPMENT AND SUSTENANCE

The infrastructure will be developed in form of a Public-Private Partnership model called Build, Design and Operate (BDO). The infrastructure and service owners will contract a private entity that will build the EU connector, Design its functionality and operate it on behalf of the owners for a contracted period. The cost of engaging the private sector will be factored into the business registration fee charged for business registration in each member state.

- Service owners: The designated service owners' business registrars in Europe under the umbrella of the Association of Business Registers in Europe. They also own the EU business connector (central broker) infrastructure. Based on this organization, it could be said that the infrastructure and service is owned by the member states.

- Service platform builders: The infrastructure and service will be built by a private sector entity on behalf of the Association of Business Registers.

## 4.4 SERVICE STAKEHOLDERS

- Service partners and enablers: There are different stakeholders who will have interest in the project. This includes:

  - The EU Business registers (an association of 25 European business registers). As mentioned in this report, they have facilitated some cross-border initiatives between business registers in Europe. They will have an interest in the development of such an infrastructure and service.

  - National business registers: They deliver business registration services in their various jurisdictions. In this project, they own the infrastructure via the association of Business registers.

  - EU- funding schemes: There are different EU funding mechanisms that fund cross-border service delivery. These includes, the Connecting Europe Facility (CEF), Horizon 2020, Interreg funding to mention a few.

o   EU commission: The EU commission is interested in the facilitation of movement of businesses and citizens within the European Union. As mentioned earlier in the introductory section, the commission is on course in the development of the Single Digital Gateway, based on the Single Digital Gateway regulation. Major aspects of the regulation focuses on the cross-border movement of businesses.

o   National governments (executive and parliamentary): Governments in each European country are open and interested towards facilitating more foreign direct investment into their countries. Supporting this project will enable them to woo would be investors to their respective countries. This is because, the lowered market entry barrier will enable more SMEs join the respective national markets, thereby creating new jobs.

o   Private sector players: A section of the private sector players, especially in the ICT industry has the potential to deploy and manage the infrastructure on behalf of the public sector. The private sector at large will also benefit from the infrastructure. This is because the service delivered via the infrastructure enable the mobility of their good s and services within the EU.

o   Banks: Banks are central to the company registration process. This is because the would-be investor has to pay in the share capital as one of the steps in the company registration process. However, banks are potential source of financing the development of the infrastructure.

## 4.5 SERVICE TARGET

The service will have direct and indirect benefits for certain stakeholders. Hence, the service is developed with these target groups in mind.

*   Service users and customers: The users will derive direct benefits from the service. The users are natural persons that represent legal persons in a business registration process. These are natural persons representing:
    o   Sole proprietorships,
    o   Partnerships, and

o   Limited liability companies

- Service beneficiaries: Service beneficiaries include those stakeholders that will derive direct and indirect benefits from the service. The indirect beneficiaries include the service owners (National business registrars), Government agencies involved in the business registration process (Tax office, Licensing offices, the police etc.), the banks and the private sector (infrastructure builders). The direct beneficiaries are the customers.

## 4.6 POTENTIAL COST OF SERVICE DELIVERY

- Service cost: In this showcase, the service cost considered were the capital expenditure and operational expenditure that would be incurred in the delivery of the service. In developing the EU connector, the capital and operational expenditures will be borne by the private sector. While at the national business registers will bear the capital and operational expenditure in the upgrade and operation of their infrastructure.

The potential list of capital expenditure are as follows:

- The cost of building the centralized platform
- The cost of upgrading the centralized platform
- The cost of Equipment/technology costs
- The cost of maintenance cost

The potential list of operational expenditure are as follows:

- This will be cost borne by the EEA/EU business register when providing services from their end.
- The cost of operating the centralized platform by the private sector.

## 4.7 EXPECTED BENEFITS

The national business registers, the private sector and the customer are the direct beneficiaries of the service. The national business registers will incur the following benefits:

- The ability to verify the eIDs of the customer.
- The ability to map businesses to the rightful owner across border.

- The ability to curtail fraudulent activities in the business registration process.
- They will receive more business registration request, which will also boost their economy.

The customer will incur the following benefits:

- They will experience convenience in the business registration process.
- They will save cost and time in the business registration process.
- They will be able to undertake cross-border business registration.

The private sector:

- They will earn a fee for service delivery that will be charged as part of the processing fee.

## 4.8 MARKET VALUE OF THE SERVICE

- Value proposition

    The value proposition of the service to the customer include:
    o The service saves time and further reduces search cost for the customer.
    o The service saves cost for the customer. This includes the administrative cost, transaction costs, and travelling costs (if the customer is to facilitate the application in person).
    o The service enables faster access to the market.

## Name of Service

**G2B Cross-Border Business Registration**

## Vision

Why are we doing this?

To facilitate seamless cross border business registration process for companies in the EU

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## Owners & Builders

Who is building and running the service? How are they organised?

**Platform Ownership**

- Association of Business registers in the EU

**Platform Builders**

- Business registers from EU/EEA member states

## Key Activities

What do we do to keep the service running and evolving?

- Mainly market entry activities

## Value Proposition

What value are we providing to the customer? What pains are we relieving, what joy are we supporting?

**Value proposition For Companies**

- Time savings
- Cost savings
- Faster access to the market

## User Journeys

How does the customer find us, what does the customer go through when using the service?

1. Service awareness
2. Service consideration
3. Service adoption
4. Feedback from service provider

## Users & Customers

Who are the users who actually use your service

Natural persons who represent legal persons such as

- Sole proprietorships
- SMEs and Large cooperations
  - Partnerships
  - LLC
  - PLC

## Elevator pitch

How do we explain the service to a layperson?

This service enables EU/EEA based companies to register their business or their branches in another EU/EEA member state without physical presence at the country of registration.

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## Partners & Enablers

Who is helping, financing us? Who is cheering us on? Who needs to be involved, informed and satisfied?

- EU Business register
- national business registers
- EU funding schemes
- national Governments/ Parliament
- Banks/Private sector providers
- And many others

## Resources and prerequisites

What resources do we have in terms of money, people, favour, technology stack, political will and policy frameworks?

- Access website/mobile app
- Content delivery infrastructure
- Funding agency
- Platform development team
- Platform management team
- Modified national policies and laws.

## Ways of service

How are we serving the customer, what is the process like?

1. Information on the business registration requirements from each member state.
2. Online business registration application and transaction with the selected member state.
3. Feedback on their application from the respective member state.

## Beneficiaries

Who are the people who benefit from the service running smoothly, but may not be using the service themselves?

- The Business registers
- The companies
- Government agencies involved, and supporting from the business registration process

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## Costs

What are the one-time investments and ongoing costs of running the service?

**Capital Expenditure (centralized platform)**

- Cost of building the centralized platform
- Cost of upgrading the centralized platform
- Equipment/technology costs
- Maintenance cost

**Operational Expenditure**

- This will be cost borne by the EEA/EU business register when providing services from their end.

## Benefits

What benefits do we get from the customers and beneficiaries? How do we measure these benefits?

- Convenience in the business registration process for companies .
- Cost savings in the business registration process for companies.
- Remote cross-border business registration possibilities for companies.

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Loosely based on the Business Model Canvas / strategyzer.com/canvas

## SECTION 5. SERVICE FEASIBILITY

In this section, the focus is on the potential demand for the intended service. It will focus on the potential demand from new companies and existing companies who intend to move part or all of their company operations to another member state.

## 5.1 SERVICE FEASIBILITY FOR NEW COMPANIES

The potential demand for the service can be identified via the evaluation of the success of similar initiatives in an EU member state. In 2014, Estonia launched the e-residency programme. One of the reasons for doing so was to enable cross-border business registration. In this programme, e-residents are provided with Estonian eIDs. The eIDs enables e-residents to, among other things, perform cross-border business registration. Estonia simplified and modified their business registration rules and the business registration transactions are performed digitally. Estonia is now home to 6000 companies owned by e-residents and they paid 10 million Euros in direct taxation to Estonia[12].

The Estonian experience works because companies seek countries where the market entry barrier is low. This is also what the proposed showcase service can facilitate. The caveat is if it is delivered under the proposed legal conditions provided in this report. The adoption of the proposed service will open up national markets. This will result in the birthing of new companies and therefore result in the creation of employment. Based on the Estonian experience, it could be said that there is potential demand for a cross-border business registration service that is less cumbersome, easy, lowers the transaction costs as well as provide convenience to the applicant in the EU.

## 5.1 SERVICE FEASIBILITY FOR COMPANY MOBILITY

In a study conducted by Ernst and Young[13], they found out that cross border transfer of registered office and cross-border division of companies as a means of increasing productivity is commercially attractive to companies. However, they realized that most companies do not find mobility within the EU attractive due to, among other factors, the cumbersome nature of the business registration process.

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[12] https://medium.com/e-residency-blog/e-residency-is-4-years-old-so-heres-4-surprising-facts-about-the-programme-c3a9d64c988d
[13] https://ec.europa.eu/info/publications/ey-study-assessment-and-quantification-drivers-problems-and-impacts-related-cross-border-transfers-registered-offices-and-cross-border-divisions-companies_en

Furthermore, majority of the companies in the EU are Small and Medium scaled Enterprise (SME). They provide employment to most citizens within the EU[14]. These enterprises are growing at a relatively steady rate as seen in the figure 16 below. As seen in the figure below, SME growth in Lithuania is highest with close to 20% and sharpest in Malta and Iceland. At some point due to the saturation of the national market, these enterprises will definitely want to expand their operations.

**Enterprise birth rates, business economy, 2015 - 2016 (%)**
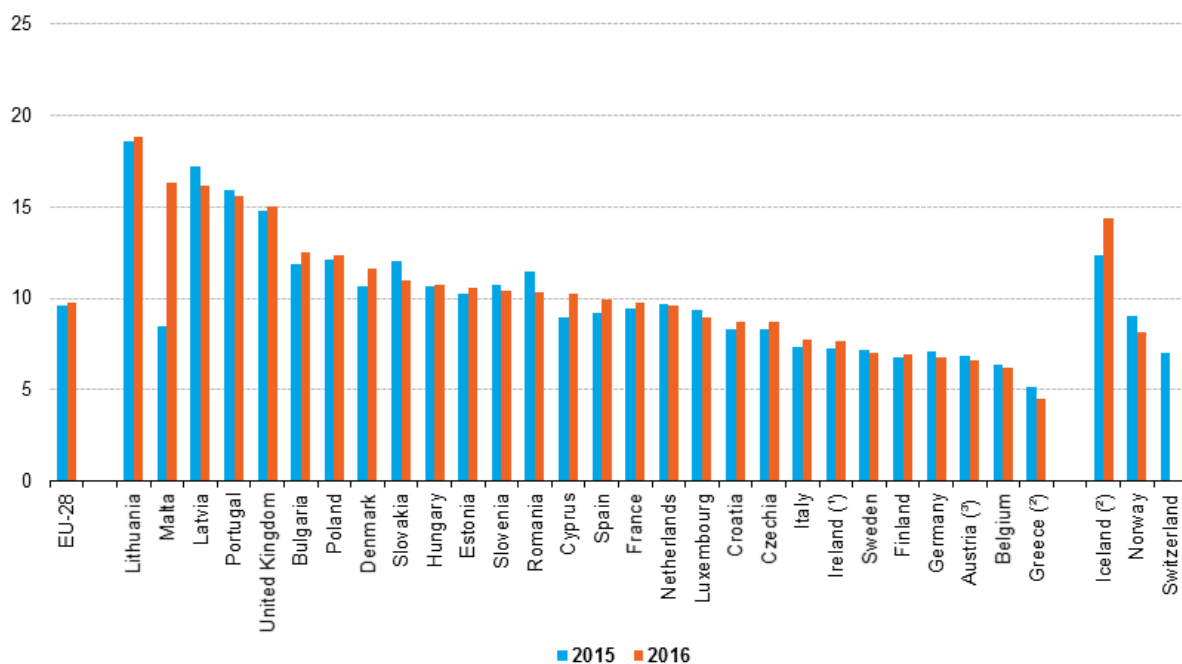
(¹) estimated
(²) provisional
(³) provisional in 2016
*Source:* Eurostat (online data code: bd_9bd_sz_cl_r2)

eurostat

Figure 16.

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However, they are impeded by national regulations of their targeted member state when it comes to ease and cost in the business registration process. This coupled with the lack of digital solutions to support the cross-border G2B life cycle stifles the expansion of SME.

Therefore, business mobility is a priority for companies that intend expand beyond one EU member state. This will enable them to become productive and become a source of employment for EU citizens. However, so far, based on the legal and technical restrictions mentioned so far, the mobility of companies is very low at a continental level.  As examples, from the Ernest Young's report, the annual number of companies that expand their operations is within the EU is about 600 annually[15]. Whereas the annual number of companies that shift their operation is about 100 annually.  Hence, there is potential demand for a technical and legal solution for the challenge.

This implies that the implementation of the proposed technical and legal solutions will open the door for increased mobility of businesses and an increase in the volume transaction for national business registers. In this manner, the infrastructure and the service can be financially sustained based on the PPP model mentioned earlier.

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[15] https://blogs.ec.europa.eu/promotingenterprise/barriers-for-smes-on-the-single-market/

## SECTION 6. LEGAL FEASIBILITY

The major challenge to this service, as will be discussed later, are legal barriers at the national level. However, the legal feasibility for this showcase is emerging at the EU institutions. At a continental level, the EU is about to draft a law to facilitate the cross-border mobility of companies.[16] There is also a directive by the Romanian presidency being prepared to enable cross-border mobility of companies[17]. This will enable more companies to relocate effortlessly within the EU, thereby driving up the volume of business registration transactions. The infrastructure proposed in the showcase will be useful in facilitating the business registration processes. However, how these laws will be implemented at the national level is not clear yet.

However, if these EU legal initiatives are implemented, then member states will have to abide these directives and laws. That will provide legal feasibility to the development of the service.

[16] https://www.consilium.europa.eu/en/press/press-releases/2019/03/27/eu-to-facilitate-cross-border-mobility-of-companies/

[17] https://www.consilium.europa.eu/en/press/press-releases/2019/01/30/eu-to-facilitate-cross-border-mobility-of-companies/

# SECTION 7. TECHNICAL FEASIBILITY AND ADVANTAGES

In this section, we discuss two things. The first is the technological advantages and feasibility of important components of the technology. These are the middleware and the eIDAS framework. The second thing is the advantage of the technological scenario as a whole.

## 7.1 TECHNOLOGICAL ADVANTAGE AND FEASIBILITY OF IMPORTANT COMPONENTS

- **Technological advantages of the middleware:** As mentioned earlier, the middleware is customized infrastructure. It is widely noted that the reason technologies fail is its lack of alignment to the task it has to perform. The advantage of the proposed is that it is designed not just to solve a problem but also to fit the task it has to support. Although customized, the technology is designed, bearing in mind the possibility of getting its components off shelf. Furthermore, there is a lot of programming involved, which implies that the association of business registers can easily change the requirements thereby upgrading the service delivery prospects.

- **Technological advantages of eIDAS:** The major advantage of eIDAs is the fact that has the potential to enable cross-border e-Identification and possibly transactions. Nevertheless, most importantly, it is a uniform standard adopted by EU and EEA member states. That makes eIDAS vital as an eID framework in this showcase. There are expectations that in years to come, the framework will be enhanced to enable enhanced access to cross-border services. This provides a futuristic view to the upgrade in cross-border service delivery for the showcase.

## 7.2 TECHNOLOGICAL ADVANTAGE OF THE TECHNOLOGICAL SET UP

The technology was designed to fit into rea-life scenario as much as possible. This enables the relatively easy adoption and implementation of the technological setup. The set-up only proposes the middleware and eIDAS gateways. eIDAS gateway will soon be in existence and public service providers will want to enable easy cross-border access to their services. Furthermore, different member states in the EU and some of its member states such as Finland, Denmark, France, Sweden, Estonia, Germany and the UK have launched Artificial Intelligence (AI) Policies. Other member state will join sooner or later. An aspect of such policies is the delivery of public services. However, what

this implies is that future cross-border business registration might be AI driven. Hence, the vision for the infrastructure caters for this possibility as well as current situations where there will be human involvement in the cross-border service delivery.

Therefore, the approach enables different member states to upgrade their online infrastructure at their own pace without being left behind. As a result, member states do not need to incur cost in trying to change their online business registration systems to fit the middleware. The only requirement from them is to have an online business registration system, implement eIDAS access, enrich their gateways and their service becomes activated.

## SECTION 8. SERVICE THREATS

This section provides a brief description of perceived threats to the service. It further highlights the solution to the most critical threats.

### 8.1 POTENTIAL RISKS, BARRIERS AND CHALLENGES

- **Change management**: If the association of business registers cannot see the need for this service, this could be a challenge and a risk to the delivery of this infrastructure and service. Hence, it is imperative that the association of business registers be convinced of the need for this infrastructure.

- **Cost sharing in the PPP arrangement**: The second challenge will be that of finding the right cost sharing mechanism in facilitating the Public-Private Partnership. It is suggested that the a little percentage from the fees paid by companies be used to maintain the infrastructure. However, whatever the financial cost will be to the applicant is going to be dependent on the volume of monthly or annual transactions recoded in each member state. If the cumulative volume of transaction is high at a continental level, then such a cost might be negligible to the applicant. But if the level of transaction is cumulatively low, then other forms of maintaining the platform has to be considered. A possibility could be the handing over of the platform to the European Business Registers. This is because they already have the experience of deploying such platforms.

- **Substitute technology**: Although this risk is unlikely. This is because the proposed service is a customized service. However, one cannot write off the fact IT infrastructure provides might see the market in the delivery of similar solutions. This is a potential risk to the service.

- **Legal barriers**: The main obstacle to this showcase is the legal obstacle. As implied in the "As is" there will be a couple legal obstacles in the delivery of this infrastructure. Currently some member states require proof of resident to register a business entity. Furthermore, the legal requirement for the payment of share into a local bank could serve as an obstacle. This is because an applicant will not be able to complete the business registration process without fulfilling this requirement.  Another possible legal challenge is in the order of the business registration process. For example, in Spain, foreign nationals and Spanish nationals needs a tax identification number before registering a business entity. If offline requirements are made mandatory by law at the first stages in a business registration process, then online service delivery can become challenging.

Another issue involves the need for the submission of documents that are notified by notaries in the destined country. There are other legal related examples one might face.

## 8.2 POTENTIAL SOLUTION TO THE LEGAL CHALLENGES

As mentioned earlier in this report legal interoperability is needed to facilitate this service. In an earlier attempt to assess the potential interoperability maturity of this solution, legal interoperability was part of that assessment. This implies that in the absence of legal interoperability, this service will not become operational.

- The first solution towards legal interoperability is operational interoperability. In this showcase, the association of business registrars in Europe were proposed as owners of the infrastructure. The reason being that they operate the national business registration system and processes. Hence, if there is need for legal changes to enable efficient cross-border service delivery, they are the best entity to promote that idea.

- The second solution is the re-ordering of the business registration requirements without changing the laws. This would imply granting provisional business registration certificates after an online cross-border business registration application is approved. In that case, the requirements, that are national centric in nature, can be performed as a second step in the business registration process. This could include payment of share capital, finding an accountant etc. However to avoid the abuse of this grace, the company owner or company rep might be granted a timeframe, where they have to fulfil the second step or lose their license to operate.

- The third solution could be similar to the one adopted in the Estonian E-residency programme. Here national service providers provide cross border services to persons who embark on cross-border business registration. In this case, the law is not changed but modified innovatively to accommodate the cross-border applicant.

- The fourth solution could be selective regulation. This implies the provision of certain legal exemptions for cross-border business regulations. However, such exemptions would not apply

if the company owner or company representative decides to become a legal resident before making the application. That would imply that the legal resident possess the national eID.

- The fifth solution is a bit radical. It is not recommended unless it is very necessary. That would imply the radical change in regulation to enable cross-border business registration process.

These solutions require political will and legal changes. However, they point towards practical legal possibilities that would enable cross-border business delivery.

## SECTION 9. CONCLUSION AND POLICY RECOMMENDATIONS

In conclusion, the prospects for developing a cross-border business registration service enabled by eIDAS are more positive than negative. The main negative is the existence of potential legal barriers as mentioned earlier. This barrier will have an effect on cross-border legal interoperability. The positives in the feasibility is that the service will facilitate cross-border technical, organizational and semantic interoperability.

This report has highlighted regulatory solutions to the legal problems. These are mostly national centric regulatory solutions. However, for these solutions to be adopted there is the need for a coordinated multilateral effort towards common policies among policy makers and business registrars in the member states. These policies should be aim at the following:

- Facilitating greater technical and organizational cooperation between business registers to facilitate technical interoperability among themselves and with relevant agencies at the national level.
- Adopting more citizen centric regulation and laws that will facilitate cross-border business registration online service delivery. Such laws should be premised on the expected increase in Foreign Direct Investment, employment creation potentials than just protecting national interest.
- Simplifying cross-border business registration rules without doing away with aspects of the business registration procedure that is beneficial to the member states. In this case, reorganizing the process.
- The alignment of member states with their chamber of commerce to promote the ease in cross border business registration process alongside the incentives for investing in the member state.
- The provision of incentives that will make the member state an attractive place for a young entrepreneur to invest.

The showcase if implemented with the suggestions provided in the report can be implemented between member states.

| BUSINESS REGISTRATION PROCESS | Denmark | | Norway | | | | Estonia | | Lithuania |
|---|---|---|---|---|---|---|---|---|---|
| **Main online source of Information for businesses** | Virk.dk and www.danishbusinessauthority.dk | Virk.dk and www.danishbusinessauthority.dk | Altinn.no and www.brreg.no | Altinn.no and www.brreg.no | Altinn.no and www.brreg.no | Altinn.no and www.brreg.no | www.RIk.ee, www.ettevotjaportaal.rik.ee, www.investestonia.com, https://www.eesti.ee/en/entrepreneur/ http://abiinfo.rik.ee/ | www.RIk.ee, www.ettevotjaportaal.rik.ee, www.investestonia.com, https://www.eesti.ee/en/entrepreneur/ http://abiinfo.rik.ee/ | https://investlithuania.com/investor-guide/start-your-business/, http://www.registrucentras.lt/jar/index_en.php, http://www.baltic-legal.com/lithuania-registration-of-enterprises-eng.htm |
| **Agency responsible** | Danish Business Authority | Danish Business Authority | Brønnøysund Register | Brønnøysund Register | Brønnøysund Register | Brønnøysund Register | E-Business register (center of registers and Information Systems) maintained by Tartu County court (to be confirmed by Airi), Ministry of Justice | E-Business register (center of registers and Information Systems) maintained by Tartu County court (to be confirmed by Airi), Ministry of Justice | Register of legal entities |
| **Types of company considered by the agency** | All types of companies | All types of companies | Sole Proprietorship | Limited Liability Companies | Limited Liability Companies | Limited Liability Companies | All types of companies | | All types of companies |
| **Resident permit as a pre-requite for business registration** | No | No | Yes | Yes | Yes | Yes | No | No | Yes |
| **Local residence address as a pre-requisite** | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Class of applicants (company reps)** | EU applicant with no permanent address in Denmark using EIDAs | EU applicant with no permanent address in Denmark, but yet to implement EIDAS | Applicant with no Norwegian D number | Applicant with Norwegian D number | Application with one or more founders without roles in the company missing the D number, but other founder with roles have their D numbers | Application where some founders with roles do not have D numbers | Applicants from Lithuania, Belgium, Finland and Latvia | Applicants with e-residency | Online access only available for Lithuanian residents. Based on the 1st study, a small percentage of the services are online (confirmation needed) |
| **Pre-online access formality** | | Fills form 40112 and submits it to the Danish Business authority | Fill Form BR1015 to receive a D-number. The form is submitted to Brønnøysund Registerers | | | | | | |
| **Languages available online** | Danish, German, Polish, English | English | Norwegian and English | Norwegian and English | Norwegian and English | Norwegian and English | Estonian, English | Estonian, English | Lithuanian and English |
| **Type of E Identity used** | E-ID of their country | Danish Nem ID | MinID, BankID, Buypass, COMMFIDES, alternative login | MinID, BankID, Buypass, COMMFIDES, alternative login | MinID, BankID, Buypass, COMMFIDES, alternative login | MinID, BankID, Buypass, COMMFIDES, alternative login | Estonian, Latvian, Belgian, Finnish ID card; Estonian or Lithuanian mobile ID or Estonian e-Residency card | Estonian e-Residency card | |
| **Electronic access** | Applicants access the business registration portal with the eIDAs network | Applicants log in with temporary username and password | Applicant logs into Altinn using Norwegian EID | Applicant logs into Altinn using Norwegian EID | A founding partner with role in the company and with the Norwegian ID logs into ALTINN | A founding partner with role in the company and with the Norwegian ID logs into ALTINN | Applicants log into the e-äriregistri ettevõtjaportaal (e-business registry portal) | Log into the e-äriregistri ettevõtjaportaal (e-business registry portal) | |

| Registration process | The applicant chooses which type of legal entity fits your goals and activities in Denmark.Register your company online with the Danish Business Authority (DBA) to receive the Central Company Register (CVR) Number at virk.dk | The applicant chooses which type of legal entity fits your goals and activities in Denmark.Register your company online with the Danish Business Authority (DBA) to receive the Central Company Register (CVR) Number | The applicant fills out the Coordinated Registration Report form in Altinn. <br><br> • The forms are prepopulated with information from the Central Coordinating Register for Legal Entities and the National Population Register. (on paper) <br><br> • Legal support provided by the back-office system in the case of paper-based applications is a built-in feature of electronic forms. Submitters of electronic forms receive an error message before they submit it. <br><br> • make payment | The applicant fills out the Coordinated Registration Report form in Altinn. <br><br> • The forms are prepopulated with information from the Central Coordinating Register for Legal Entities and the National Population Register. <br><br> • Legal support provided by the back-office system in the case of paper-based applications is a built-in feature of electronic forms. Submitters of electronic forms receive an error message before they submit it. <br><br> • make payment | The applicant registers the limited company by using the form " Coordinated registration. <br><br> • Submit the founding document, articles of association and confirmation of paid-up share capital. <br><br> • Send the message to signing and sign the message. The entire board must sign the message electronically and the bank must sign electronically on the confirmation that the share capital has been paid. If the limited company has chosen to have an accountant, the auditor may electronically sign the report. <br><br> • make payment | Register the limited company by filling out the paper company registration form (Coordinated Register Report - Part 1 - Main Form) and D-Number Application (a form for each person in need of D-Number because they will have a role in the company). Submit confirmation of paid-up share capital and confirmed copy of valid ID for the person (s) applying for a d-number. | For private limited companies, on the company registration portal, the shareholders can <br><br> • Create article of association based on the template <br> • Submit memorandum of association <br> • Submit the application forms <br> • Submit the bank certificate confirming they have paid the minimum share capital (not obligatory) <br> • Submit information on communication devices <br> • Make payment <br><br> For sole proprietors, on the company registration portal the applicant must <br> • Indicate he/she has a  business account <br> • Show proof of residency in Estonia <br> • Indicate area of activity <br> • Pay the fee | For private limited companies, on the company registration portal, the shareholders can <br><br> • Create article of association based on the template <br> • Submit memorandum of association <br> • Submit the application forms <br> • Submit the bank certificate confirming they have paid the minimum share capital (not obligatory) <br> • Submit information on communication devices <br> • make payment <br><br> For sole proprietors, on the company registration portal the applicant must <br> • Indicate he/she has a  business account <br> • show proof of residency in Estonia <br> • Indicate area of activity <br> • Pay the fee | Companies not located in Russia, Ukraine, Belarus, Moldova, Estonia and latvia submit the following notarized documents to the Register of legal entities. <br><br> 1 For individual enterprises <br> • Submission of form JAR-5  for temporary inclusion of the name of the enterprise into the Register <br><br> 2 For small partnerships <br> • Submission of the memorandum of association and act of establishment <br> • Submission of form JAR-5  for temporary inclusion of the name of the enterprise into the Register <br> • submission of the statutes of small partnership <br><br> 3 for Private limited liability company <br><br> • Submission of article of association or act of establishment (if single owner), <br> • The founders may submit to the Register of Legal Entities an application (form JAR-5) for temporary inclusion of the name into the Register. <br> • Evidence that An initial contribution for the subscribed shares is paid <br> • Prior to the signature of the articles of association of the company, the valuation of the contribution in kind intended for partial payment for shares must be made by an independent property valuer <br> • an approved founder's report of the limited liability company and elect the members of bodies of the company elected by the general meeting of shareholders. If the supervisory board is elected, it must elect the board, if any, or the manager of the company if the board is not formed before registration of the company. The elected board must elect the manager of the company <br> • The company statues are drawn up and signed |
|---|---|---|---|---|---|---|---|---|---|
| Digital signature | Applications are digitally signed | Applications are digitally signed | Application are digitally signed by all parties to the application | Application are digitally signed by all parties to the application | Application are digitally signed by all parties to the application | | Applications are digitally signed | Applications are digitally signed | |
| E-delivery in the application submission process | Yes | Yes | NO, must be on paper, if D-number is applied for at the same time as the Coordinated Registration Report form. | Yes | Yes | No this is by post | Yes | Yes | |
| E- delivery in the delivery of feedback for application | Yes,(feedback delivered by email where you can  ordering NemID, NemKonto and creating digital mailbox) | Yes,(feedback delivered by email where you can  ordering NemID, NemKonto and creating digital mailbox) | Yes (Feedback received in the ALTINN mail box) | Yes (Feedback received in the ALTINN mail box) | Yes (Feedback received in the ALTINN mail box) | No | Yes | Yes | |
| VAT registration process | (DBA) will send your details to SKAT | (DBA) will send your details to SKAT | Already handled in the previous registration processes | Already handled in the previous registration processes | Already handled in the previous registration processes | Already handled in the previous registration processes | Only applicable if the annual turnover exceeds 40,000 euros. <br><br> In that case the company registers with the Tax and customs board <br><br> • online access at https://www.emta.ee/eng/emta_login/nojs <br> • using mobile ID, Internet banking or user ID | Only applicable if the annual turnover exceeds 40,000 euros. <br><br> In that case the company registers with the Tax and customs board <br><br> • online access at https://www.emta.ee/eng/emta_login/nojs <br> • using mobile ID, Internet banking or user ID | |
| | | | Not necessarily possible to register for VAT at the same time. Only if applicant can document the business will reach limit of 50.000 NOK revenue/investments within 3 weeks. | | | | | | |
| Before commencement of service | The applicant logs in with NEM ID into the  Register of Foreign Service Providers (RUT) and registers as a foreign service provider in Denmark | The applicant logs in with NEM ID into the  Register of Foreign Service Providers (RUT) and registers as a foreign service provider in Denmark | | | | | | | |