D4.6 Doing Business Abroad – Pilot Planning

Document Identification			
Status	Final	**Due Date**	31/03/2021
Version	1.0	**Submission Date**	20/04/2021

Related WP	WP4	**Document Reference**	D4.6
Related Deliverable(s)	D4.5, D2.1, D2.4	**Dissemination Level (*)**	PU
Lead Participant	RVO	**Lead Author**	Ivar Vennekens, Ard van der Heijden, Bart van Bekkum, Dennis Reumer (RVO)
Contributors	Hans Ekstål (BVE) Malin Norlander (BVE) Michelle Ludovici (BVE) Carl-Markus Piswanger (BRZ) Olga Suchow (BRZ) Joris Wittenberg (RVO) Danut Tiparu (ONRC)	**Reviewers**	Fredrik Linden (SU) Alberto Crespo (ATOS)

Keywords:
DBA, Doing Business Abroad, pilot planning, MVP, process design, gaps, integration of common components, Member State specific activities, testing, test plan, user engagement, acceptance criteria, go-live preparation activities, eIDAS, OOP Technical system, company registration evidence, preview, explicit request, eProcedure portal, Austria, The Netherlands, Romania, Sweden.

Document Information

List of Contributors	
Name	Partner
Olga Suchow	BRZ
Carl Markus Piswanger	BRZ
Malin Norlander	BVE
Hans Ekstål	BVE
Michelle Ludovici	BVE
Danut Tiparu	ONRC
Joris Wittenberg	RVO

Document History			
Version	Date	Change editors	Changes
0.70	12/03/2021	Ivar Vennekens, Ard van der Heijden, Bart van Bekkum, Dennis Reumer	Version for internal review
0.9	06/04/2021	Ivar Vennekens, Ard van der Heijden, Bart van Bekkum, Dennis Reumer	For final QA and submission
1.0	16/04/2021	Atos	Quality check for submission

Quality Control		
Role	Who (Partner short name)	Approval Date
Deliverable leader	Hans van der Burght (RVO)	06/04/2021
Quality manager	Julia Wells (ATOS)	16/04/2021
Project Coordinator	Ana Piñuela Marcos (ATOS)	19/04/2021

Table of Contents

List of Tables

List of Figures

List of Acronyms

Abbreviation / acronym	Description
CAAR	Cross-border Access Authorisation Registry
DC	Data Consumer
DE	Data Evaluator
DE4A	Digital Europe for All
DP	Data Provider
DR	Data Requestor
eID	Electronic Identity
eIDAS	Electronic Identity and Trust Services: Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC
ER	Explicit Request (as defined in the SDGR)
IdP	Identity Provider
LoA	Levels of Assurance
MMS	Mandate Management Systems
MOR	Multilingual Ontology repository
MVP	Minimum Viable Product
MS	Member State
OOP	Once-Only Principle
OOP TS	The Once-only Technical System as defined in the SDGR
PMG	Pilot Management Group
PSA	Project Start Architecture
PV	Powers Validation
SDG	Single Digital Gateway
SDGR	Single Digital Gateway Regulation: Regulation (EU) 2018/1724 of the European Parliament and of the Council of 2 October 2018 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU) No 1024/2012
SEMPER	Cross-border Semantic Interoperability of Powers and Mandates https://www.a-sit.at/en/semper/
UC	Use Case
WP	Work Package (logically ordered set of activities of the DE4A project).
WP2	Work package for architecture Vision and Framework
WP3	Work package for validating semantic components
WP4	Work package for cross-border Pilots for Citizens and Business and Evaluation
WP5	Work package for re-using common designs and components
WP7	Work package for legal and ethical compliance and consensus building

Executive Summary

This deliverable specifies the design of the Doing Business Abroad (DBA) pilot and provides a plan for managing all activities in the upcoming two phases: customization and integration phased and pilot running phase. It provides a sound basis for the piloting Member States to perform the tasks to customize and integrate the components, test the components, involve real users and run the pilots. As none of the piloting Member States can run a pilot without at least one other Member State, central to this document is pilot alignment: making sure Member States converge their activities at pre-defined milestones.

This document is intended for all partners participating in the DBA pilot as well as DE4A work packages that provide inputs to the pilot and that depend on the pilot's results. It is a reference to monitor progress of pilot activities for integration of common components with national pilot endpoints where substantial effort of customization and some local implementations (e.g. clients to integrate with APIs and transformation to canonical evidence) are foreseen.

The Doing Business Abroad (DBA) pilot of the DE4A project, implements eProcedures for starting and doing business cross-border in Austria, The Netherlands, Romania and Sweden[1]. It improves currently available cross-border procedures by implementing the Once Only Principle (OOP) and Digital-by-default[2]. Under the explicit request of the company's representative, the eProcedure portal will retrieve company registration evidence directly from the authentic source in the Member State of registration in the first pilot iteration. The second pilot iteration adds - amongst others - a mechanism to notify the eProcedure portal of business events that might impact its eServices (e.g. the company goes bankrupt - subscription & notification pattern) and allows for a light weight updating of company data (Lookup pattern). Piloting solutions to these highly complex processes are an important step in breaking down barriers in the European single market. In the end companies should be able to do business in any other Member State as easily as they do nationally. The DBA pilot highly values experience from piloting real eProcedures:

- the pilot serves as a way to learn about different possibilities to provide OOP Digital-by-default and serves as input for the implementing act of the Single Digital Gateway Regulation (SDGR) (with up to 3 different patterns to be used in DBA and including major specific aspects like representation of companies);
- in particular the DBA pilot focuses on real needs of Member States to help them along the SDG journey and generates for them hands-on knowledge, in particular for all the Member State-side implementations and elements (eIDAS, eDelivery, Preview…) that are necessary to integrate successfully with an evidence exchange Once-Only Technical System;
- a large potential is generated to re-use National Integration layer components & strategies;
- by integrating with real Member State infrastructure and allowing to pilot with real data, DBA validates multiple solutions for legal / organizational / semantic / technical challenges and DBA is ready to share these results (relevant for technical specifications, joint infrastructure implementation, semantic models, user journeys, etc.)

[1] Note that after the submission of D4.5 Doing Business Abroad - Use cases definition and requirements Belgium has withdrawn from the DE4A-program and will not participate in the DBA-pilot.

[2] See Berlin Declaration on Digital Society and Value-Based Digital Government which updated the Tallinn Declaration on eGovernment: https://ec.europa.eu/digital-single-market/en/news/berlin-declaration-digital-society-and-value-based-digital-government.

The DBA pilot addresses some of the most important (research) questions for successfully implementing the SDGR and SDGR-related processes. Besides validating the OOP technical System for evidence exchange in real use cases, the DBA pilot extends the use of *eIDAS* to include representation scenarios: a natural person representing a company to apply for a specific eProcedure *in another Member State*. An adequate solution for authenticating on behalf of companies is needed to implement the eServices to business that have been defined in the second annex of the Regulation. Using eIDAS authentication 'on behalf of' to start an eProcedure in the SDGR-domain requires coordination by the eProcedure portal: invoking eIDAS and using the result in an evidence request to the OOP Technical system. The portal can only do this when the concepts and solutions of both domains are fully aligned and the domains are connected. This is of special interest to the DBA pilot. Furthermore, the DBA pilot evaluates several SDGR-specific and related functions, like evidence exchange using the OOP TS components (including the DE4A connector), explicit request and preview, generation and exchange of canonical evidence and record matching. Finally, the DBA pilot provides guidance on future evolution of cross-border information flows by exploring a mechanism to notify public authorities of relevant business events impacting the eServices they provide.

The main characteristics of the DBA pilot management are summarised below.

- The DE4A project identified two pilot iterations: the first pilot iteration and the second pilot iteration. The intermediation pattern will be piloted in the first iteration, being the minimum viable product for piloting DBA. The DBA pilot partners - among others - intend to pilot two additional interaction patterns in the second pilot iteration: subscription & notification pattern and the lookup pattern. For these last two patterns the project start architecture [3] has yet to be constructed, then the solution architecture needs to be designed and then the Member States need to identify gaps and plan the tasks to overcome the gaps. As this is all work to be done (at the moment of writing this document), this document focusses on the first pilot iteration and elaborates on the second iteration only on a high-level.
- The DE4A project adopted the Agile approach. In the DBA pilot this is reflected in the way pilot partners cooperate in stand-ups, reviews, refinement meetings, use of JIRA, etc. Furthermore, several milestones have been defined in order to progress in the customization & integration of components on a step-by-step basis. The milestones represent common dates for high-level alignment between the pilot partners and the other parts of the DE4A project that provide components needed for piloting. Evaluation of the results of one milestone will be input to the second milestone's activities. Also, the testing activities have been organised in an Agile way. Each milestone requires the Member States to perform national and cross-border tests. After achieving all milestones, the testing activities should be concluded and the pilot should be ready to go live. This will be done progressively in order not to be dependent on the slowest Member State to complete all tests: Member States ready to go live can do so and start pilot running with Member States that are live as well.
- The DBA pilot requires extended use of eIDAS as compared to current practise. eIDAS will not only be used for sending natural person attributes, but also for legal person attributes and (later on in the project) information on powers of representation. This extended ('innovative') use of eIDAS is crucial to the success of the pilot and is the main focus of piloting.
- The DBA pilot introduces new solutions to cross-border Company representation. These solutions have not been proved yet (use of legal person attributes in eIDAS) or have been piloted in a small scale only (powers validation attributes in the SEMPER project). Therefore, the main focus of the pilot is on validating these solutions for the SDGR and SDGR-like procedures (and thus answering the research questions of the pilot). The same goes for the two patterns to include in the second

pilot iteration (Subscription & notification and Lookup) as these patterns likely introduce new concepts for implementing OOP cross-border.

- By the nature of the eProcedures to pilot (like first time registration for DBA), the frequency of the eProcedures is relatively low. There is just a limited number of companies from a data providing Member State starting to do business in a data consuming Member State. The pilot Member States will involve these companies as much as possible, but also involve companies from within the professional network of the DBA partners (companies known to pilot participants). The pilot does not expect to gather a high volume of metrics.

1 Introduction

In the "use case definition and requirements" project phase the Doing Business Abroad (DBA) pilot's use cases have been defined and analysed and requirements have been defined. The results have been documented in deliverable D4.5 Doing Business Abroad Use Case Definition and Requirements [2]. In the current project phase ('pilot planning') the project formulated working assumptions, addressed common topics, designed the company registration evidence type, designed the pilot processes per Member State[3], identified gaps to bridge by the Member States and constructed the solution architecture for the first use case. Furthermore, the DBA pilot partners defined the activities that have to be performed for customization & integration of the software components needed to pilot, the testing activities and the user involvement activities (the *customization & integration phase* of the project). For coordination purposes, the project defined the milestones to achieve jointly and the timelines for doing so. This overall planning has been further detailed per Member State in a national pilot management plan. Finally, the project constructed a high-level plan for the *running phase* of the pilot.

The following figure shows the Doing Business Abroad overall planning:

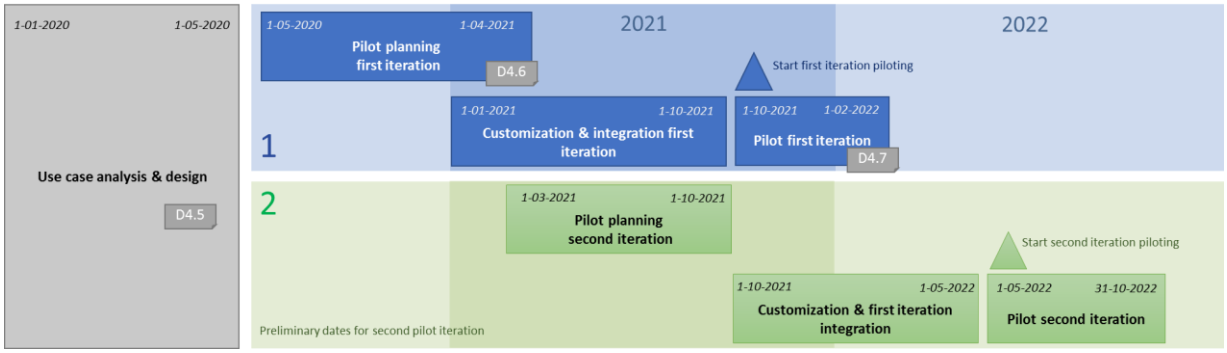


Figure 1: Doing Business Abroad overall planning

1.1 Purpose of the document

The purpose of this document is to plan all activities for the customization & integration phase of the pilot (in detail) and the running phase (high-level). In doing so, this document aims to capture the most relevant information produced since producing deliverable D4.5 (use case definition & requirements) [2].

This document has been constructed in close cooperation with all DBA pilot partners. In the current project phase, the pilot partners attended two-weekly stand-up meetings, monthly sprint reviews and refinements, composed DC- and DP-specific pilot design documents, created a detailed member State specific planning for the customization and integration activities, organised and joined several topic-specific meetings (e.g. on use of the Once Only Technical System (OOP TS) for piloting DBA and on the use of eIDAS), participated in multiple project-wide alignment meetings and actively participated in aligning with other initiative, like the SDG OOP preparatory actions. In doing so, the pilot partners have

[3] Note that after the submission of D4.5 Belgium has withdrawn from the DE4A-program and were not involved in the creation or review of D4.6.

achieved substantial progress, not only in preparing for the pilot's go-live, but also in contributing to the design of the SDGR technical system and revision of eIDAS. The pilot partners are confident the results as presented in this document provide a solid basis for continued collaboration within the DE4A project and beyond, for customization & integration as well as the pilot running activities.

As a result of the progress achieved in this project phase, a lot of knowledge has been developed and documents have been produced. Much of this is also included in this document. Furthermore, this document builds upon the results documented in D4.5 [2]. The processes, concepts, requirements, etc. mentioned there have not been copied into this document.

The text in this document assumes the reader is familiar with the D4.5 Doing Business Abroad Use Case Definition and Requirements deliverable [2]. The concepts, terminology, etc. that have been addressed there, are considered to be required knowledge for reading this document.

1.2 Structure of the document

The structure of this document is as follows:

- Chapter 2 specifies the goals of the pilot, the criteria to meet and the way to measure them.
- Chapter 3 specifies the design of the pilot. It mentions the major design decisions, the generic (updated) pilot process, the data model for the Company registration evidence type and the common and specific components to use or deploy.
- Chapter 4 focusses on the activities that need to be performed to implement the pilot design specified in Pilot design. The activities have been defined on a generic level, meaning they are not Member State specific, e.g. the eProcedure portal needs to add an eIDAS-login option, connect to the national eIDAS node, implement the explicit request, invoke the DE4A connector, preview the data, etc. The activities focus on the customization & integration phase and are organised into 4.1 common component customization & integration activities, 4.2 specific component customization & integration activities, 4.3 testing activities and 0 user involvement activities.
- Chapter 5 includes a high-level management plan for management of the pilot phases ahead, specifies the milestones, the timelines and the activities related to achieving the milestones. Furthermore, it mentions the prerequisites and dependencies as well as the risks identified.
- In chapter 6 all participating Member State elaborate on the activities defined in Customization and integration pilot management plan. The resulting tasks reflect the work to be done in each of the Member State to Go-Live. This chapter includes the planning of the Member State specific tasks, the risks and mitigating actions.
- Chapter 7 presents the management plan for the running-phase, including Go-live criteria, running phase avidities, milestones, planning, governance and risks.
- The final chapter, chapter 8, presents the conclusions of the customization & integration phase. It focusses on the progress that has been made during this phase.
- Annex 1 – Solution architecture concerns the Solution Architecture for Doing Business Abroad
- Annex 2 – Draft questionnaires specifies the draft versions of the questionnaires for gathering the metrics needed to evaluate the success criteria.
- Annex 3 – XSD of company registration evidence type elaborates on the Company registration evidence by presenting the XSD scheme for this evidence type.
- Annex 4 – Member State specific pilot designs concerns the Member State specific pilot designs.

Annex 1 – Solution architecture and Annex 4 – Member State specific pilot designs have been constructed as intermediate – and internal – project deliverables during the pilot planning phase. With these internal deliverables, alignment with other work packages of the DE4A project has taken place. As a result, more information became available, terminology has been refined, designs and solutions have been improved, etc. The most important results have been included in this document. The annexes Annex 1 – Solution architecture and Annex 4 – Member State specific pilot designs themselves have not been updated though. They have been included for reference only *as is*.

In general, this document uses the terminology that was available to the authors at the moment of constructing this deliverable. As expected in the current phase of the project, wording changes over time, e.g. component names may be refined, process names improved, etc. Improvements that became apparent after writing of this deliverable have not been included to precent inconsistencies with previous (internal or external) deliverables, like the DBA solution architecture (Annex 1 – Solution architecture) and the project design documents (Annex 4 – Member State specific pilot designs).

1.3 Glossary adopted in this document

The table below defines some of the most relevant terms used in this document.

Term	Definition
Activity	Work to be done by partners involved in the DBA pilot to customize & integrate the components, test, involve users and run the DBA pilot. Activities have been defined in a generic (meaning non-Member State specific) manner.
Business register	The *authentic* source of company information. It is a set of data held by a body that has been appointed by a legal act to manage these data. The data is authoritative in the area of starting and doing business. All data providers in the DBA pilot manage authentic sources of company data.
Common component	A component used by multiple Member States for piloting DBA. E.g. the DE4A connector and the eIDAS node.
Company	A legal entity operating within the Digital Single Market. In the context of the DBA pilot, the company is the entity that does business in another Member State.
Company identifier	A number or string by which a company can uniquely be recognised within a given context, e.g. the national business register. In the DBA pilot, companies need to be identifiable across borders.
Company register	A *non-authentic* source of company information. This data source usually will be maintained by a Point of Single Contact (PSC) or a specific service provider. The information within these registries is not authoritative and is intended to be used within the scope of portal or service provider only. The information in the company registers need to be retrieved from the authentic sources directly or indirectly (via transfer of 'proof of registration'). The company register's records consist of a subset of the authentic information from the business registers supplemented with non-authentic information specific to the portal or data consumer. Some of the data consumers in the DBA pilot operate a Business Register (authentic) and some operate a Company Register (non-authentic). Company register is frequently referred to as "company portal register".
Competent authority	Any Member State authority or body established at national, regional or local level with specific responsibilities relating to the information, procedures, assistance and problem-solving services covered by the SGDR. In the DBA pilot, the competent authority can be a data provider or a data consumer.
Component	Software used for implementing a coherent set of features required for piloting DBA.
Data consumer	The role played by an organisation/administration that is in demand of the Data in order to fulfil its mission to society or industry.
Data evaluator	A data consumer authorized to receive and process data from citizen or business, via the Once Only Technical System. Other naming: service provider

Term	Definition
Data owner	A data provider owning information about citizens or businesses, a base registry or a secondary registry that might be necessary for another organisation to exercise their competencies.
Data provider	The legal entity that is in charge of the Data deployment.
Data requestor	A data consumer making search and request for data possible in terms of technology.
Data transferor	A data provider technical responsible for the actual data transmission.
eProcedure Portal	A website presenting the user with one or more eServices for companies. In the DBA pilot these services will also include SDGR procedures and services under the Service Directive. The company portal may be a gateway to several service providers and the Business register.
Evidence	Any document or data, including text or sound, visual or audio-visual recording, irrespective of the medium used, required by a competent authority to prove facts or compliance with procedural requirements referred to in point (b) of Article 2(2) of the SDG Regulation.
Evidence service locator configuration file	The ESL configuration file will be used in first iteration piloting for locating the data owner. It will be integrated ion the DE4A connector. The ESL configuration file is also called “Information desk configuration file”.
Explicit request	SDGR: The competent authorities responsible for the online procedures referred to in paragraph 1 shall, upon an explicit, freely given, specific, informed and unambiguous request of the user concerned, request evidence directly from competent authorities issuing evidence in other Member States through the technical system (2018/1724 Art. 14 point 7).
Identity Provider	The organisation authenticating a person.
Information desk configuration file	See “Evidence service locator configuration file”.
Iteration	A set of sequential phases to define, prepare, run and evaluate the DBA pilot for a specific set of functionalities. The DBA pilot (as dictated on DE4A level) has two pilot iterations.
Level of Assurance	The certainty to which a person’s identity has been established. The eIDAS regulation defines LoA Low, Substantial and High.
Mandate management system	A registration of a person’s powers to represent another person. A mandate management system may be dedicated to registering mandates only, but may also be part of other systems, like a national Business register (for legal representatives).
Milestone	A predefined (intermediate) result of the DBA pilot customization & integration phase.
Natural person	A Natural person in the DBA pilot is a physical person representing a company.
OOP Technical System	The set of components to request and provide the evidence, notify the data evaluator and update company data in the DBA pilot.
Powers	A natural person’s mandate to represent the company.
Powers validation	The process of checking whether a natural person has the mandate to represent the company for a specific eService.

Term	Definition
Preview	SDGR: The technical system shall enable the possibility for the user to preview the evidence to be used by the requesting competent authority and to choose whether or not to proceed with the exchange of evidence (2018/1724, art. 14 point 3.f).
Procedure	A sequence of actions that must be taken by users to satisfy the requirements, or to obtain from a competent authority a decision, in order to be able to exercise their rights as referred to in point (a) of Article 2(2) of SDGR
Record matching	The process of locating the company involved in an existing registry. Example: when applying for a service, the data evaluator may want to check whether the company has been registered at the portal before. It will perform record matching with the company attributes available to the data evaluator.
Representation	Acting on behalf of another. In the DBA pilot, "representation" always refers to a company being represented.
Representative	A natural person acting on behalf of the company.
Specific Component	A component used by one Member State specifically for the configuration of that Member State.
Task	Work to be done by one of the partners in the DBA pilot. Tasks have been defined in a Member State specific manner. By performing the tasks, the Member State achieves the DBA milestones agreed upon.
User	The natural person representing a company.

2 Pilot benefits logic and metrics

2.1 Final Version of Success Criteria and Connection to Common Pilot Criteria

The Benefits Logic Method that is applied in DE4A, was introduced in previous deliverables. D4.5 [2] describes a first setup for the pilot goals and success criteria, as well as the relationship to the Technical Common Criteria (Efficiency and Effectiveness, Openness etc.) and the piloting principles Use, Value, Learning and Adoption.

Chapter 2 revisits this topic by refining and updating the goals and success criteria based on newly established insights and knowledge, but also progresses by defining quantitative and qualitative metrics for each success criterion as well as relating the metrics to the sources for data collection (Competent Authorities and Companies). Furthermore, the fact that DE4A is a research project is emphasized in the goals and success criteria. In the process to establish the final set up, pilot partners confirmed the Benefits Logic Approach by aiming to cover all aspects and creating a clear breakdown from the pilot objective and goals to SMART criteria and metrics.

2.1.1 Pilot goals

The DBA pilot's main objective is to lower barriers (paper-based processes, language challenges etc) for companies starting a business or doing business cross-border. The goals that were first described in D4.5 [2] have been refined in D4.6, and are displayed in the table below:

Table 1: Pilot goals

Actor	ID	Goal
Public authorities	A	Improve the quality of Company data within the service fulfilment process by re-using data from authentic sources, thereby reducing manual work and lowering processing costs.
Companies	B	Reduce manual work, lower transaction costs and improving enrolment speed for the company when using the Once Only Principle
Project	C	Evaluate the OOP-components supporting the cross-border information flow: - Assess (technical) impact on national services/registers already in place - Evaluate connections of national systems to the OOP TS
	D	Evaluate whether the solutions designed to the DBA specific challenges have proven adequate in piloting the DBA eProcedures: - Usability of harmonised Company Evidence model - Degree to which powers must be validated - Scalability of solution for powers validation - Usability and security of Explicit Request and Preview - Need for record matching on Natural Persons - Adequacy of patterns to keep data up-to-date

The pilot exists to objectively assess the fulfilment of the pilot goals stated above. Goal D is a research goal, requiring an explorative approach in the metrics.

2.1.2 Success criteria

Success Criteria are meant to act as pilot-wide Key Performance Indicators that facilitate the measuring of pilot success (without leaning into defining self-fulfilling objectives which could risk giving a limited view on pilot's success) and to orient the pilot towards maximization of its output with regard to Common Pilot's Principles of use, value, learning and adoption. They are a key component in terms of establishing the link from pilot results back to the satisfaction of pilot goals.

The criteria and metrics for the pilot should be Specific, Measurable, Achievable, Realistic and Time-bound (SMART), and relate to the Technical Common Criteria to be able to combine the results of the DBA-pilot to the results of other pilots in the DE4A Programme. On the other hand, the success criteria should enable to learn as much as possible on the objective and goals for the DBA-pilot, meaning that they should not be restrictive and limit/control (qualitative) feedback from users and processes and allow to assess the fulfilment of the pilot goals. To maximise learning (more than proving), metrics will often be set up as a combination of a quantitative measurement or appreciation, and a free-format observation allowing for unstructured qualitative feedback to be collected. In the metrics that will be used for the measurements, each quantitative metric is broken down to more detailed topics in order to collect fine grained results.

In some occasions, criteria should also be applicable to the baseline (traditional situation without usage of the OOP TS) so the results can be compared and the effects can be properly determined. This will hold true for the DE perspective and to a certain extend also for the DO perspective. A company (representative) on the other hand, will only apply for a service once (either in the traditional procedure or in the DE4A pilot-procedure), while tax declarations usually occur on an annual basis so comparability is not possible in every occasion.

A final consideration on criteria, is that the eProcedures are generally repeated in low volume during the pilot. The value of quantitative feedback should not be overestimated, which makes the combination with qualitative feedback even more important.

To prevent complex evaluation of the pilot it is vital not to make the criteria and related (quantitative) measurements too detailed. A limited, carefully set of criteria and metrics was chosen that target the core value of the DBA-pilot and respecting the research-objective of the DE4A programme.

The next tables display how the pilot goals are decomposed into success criteria that will be used for the DBA pilot, and maps these criteria to:

- the Common Pilot Principles
  - Use: measurable results related to the use of the procedures piloted and usability of the implemented cross-border once-only procedures does the interoperability model/solution work; which barriers are being encountered);
  - Learning: whether the pilot helps to prepare the stakeholders for the future (i.e. collecting and distributing lessons learned/ creating feedback loops);
  - Value: whether the pilot improves efficiency or effectiveness of the students and organizations involved (e.g. do the data consumers and data providers experience added values, such as administrative burden reduction);
  - Adoption: whether the pilot facilitates the process where a Service Provider (Data Consumer) or Data Provider introduces new IT tools provided by the pilot to support a (new) way of working. Adoption is limited to the adoption by service and data providers that will be part of the pilot. Adoption is not merely focused on whether a provider was finally able to introduce/integrate with DE4A but rather on all the possible lessons to be learned from this process.

- the Technical Common Criteria (Openness, Transparency, Reusability, Technical Neutrality and Data Portability, User Centricity, Inclusion and accessibility, Security & Privacy, Administrative simplification, Effectiveness & Efficiency).

This mapping allows for combining the results of the DBA pilot with the results from other pilots (moving Abroad, Studying Abroad) in the DE4A Programme, with which goal-achievement on programme-level can be evaluated.

Success Criteria for Public Authorities

Table 2: Success Criteria for Public Authorities

ID	Criterion	Technical Common Criteria	Principles
Pilot goal A: Improve the quality of Company data within the service fulfilment process by re-using data from authentic sources, thereby reducing manual work and lowering processing costs			
A1	The DE recognizes the company data is of higher quality, more reliable and easier to process when using the OOP TS to retrieve company data directly from the DO. (e.g. can data is available in an electronic and structured format for easy processing in the systems of the DE, data requires less correcting, data is kept up to date automatically, data is reliable and leads to less exceptions when processing, data is more meaningful, has less inconsistencies and errors, is more complete).	Reusability, Transparency, Effectiveness & Efficiency, Administrative Simplification	U, A, L, V
A2	The DE recognizes the method of powers validation to provide data of higher quality and reliability, proving that the representative is sufficiently authorized to represent the company (e.g. authorisation data is easier to interpret, authenticity is clear, data is trustworthy, there is less manual work in validating the users powers to represent the company with documents proving the relationship of the user to the company, authorization data requires less correcting, verification is easier).	Reusability, Transparency, Effectiveness & Efficiency, Administrative Simplification	U, A, L, V

Success Criteria for companies applying for a service

Table 3: Success Criteria for companies applying for a service

ID	Criterion	Technical Common Criteria	Principles
Pilot goal B: Reduce manual work, lower transaction costs and improving enrolment speed for the company when using the Once Only Principle			
B1	The user acknowledges the procedure for applying for a service to be effective and efficient (e.g. the procedure requires acceptable effort and cost, the procedure is not complex, has no	Reusability, Effectiveness & Efficiency, Administrative Simplification, Transparency	U, A, L, V

	language barriers, no interruptions. The user spends little manual time to correct company data, and experiences no errors after finishing the enrolment process).		
B2	The user acknowledges the method to proof their authorisation as effective and efficient (e.g. requires little effort, is established with simple and effective communication, is reliable).	Reusability, Effectiveness & Efficiency, Transparency, Security and Privacy	U, A, L, V
B3	The user acknowledges the duration of completing the online eProcedure activities to apply for a service as acceptable.	Effectiveness & Efficiency, Administrative Simplification	V, A
B4	The user saves time and/or cost when completing the eProcedure using the OOP TS.	Effectiveness & Efficiency	V, A

Success Criteria and Research Questions for Pilot Technical Goals

Table 4: Success Criteria and Research Questions for Pilot Technical Goals

ID	Criterion	Technical Common Criteria	Principles
Pilot goal C: Evaluate the OOP-components supporting the cross-border information flow: • Assess technical impact on national services/registers already in place • Evaluate connections of national systems to the OOP TS			
C1	The DO believes the cost and effort for integrating to the DE4A Connector will eventually be outweighed by the benefits.	Openness, Technical Neutrality and Data Portability	U, A, V
C2	The DE believes the cost and effort for integrating to the DE4A Connector will eventually be outweighed by the benefits.	Openness, Technical Neutrality and Data Portability	U, A, V
C3	The DO believes the cost and effort for integrating to the Mandate Management System will eventually be outweighed by the benefits.	Openness, Technical Neutrality and Data Portability	U, L, V
C4	The participating Member States believe the cost and effort for setting up and deploying the DE4A Connector in their national infrastructure will eventually be outweighed by the benefits.	Openness, Technical Neutrality and Data Portability	U, L, V
Pilot goal D: Evaluate whether the solutions designed to the DBA specific challenges have proven adequate in piloting the DBA eProcedures			
D1	Has the Company Evidence Model proven adequate for	Openness, Neutrality and Data Portability, Reusability	U, V, L

	cross-border exchange of information on companies for the DBA eProcedures?		
D2	Have the solutions to validate powers proven adequate for the eProcedures involved in piloting?	Reusability, Administrative Simplification	U, L
D3	Have the explicit request and preview requirements as specified in the SDGR proveD5n suitable for company eProcedures (representation scenarios)?	Administrative Simplification, User Centricity, Inclusion and Accessibility	U, L
D4	Have the mechanisms for record matching at the DC proven adequate for the DBA eProcedures?	Administrative Simplicity	U, L
D5	Have the mechanisms to keep the company information up-to-date (second pilot iteration) proven adequate	Administrative Simplicity, Effectiveness & Efficiency	U, V

2.2 Qualitative and quantitative metrics

In order to learn about the success criteria (and determine if goals are achieved), one or more items must be measured per success criterion during the pilot runs. This paragraph addresses these metrics, per success criterion. Each metric is connected to a process step (see D4.5 [2]) to specify when the measurement should be executed. The following metrics are defined (see tables below) after a process of careful selection and prioritisation. A set of draft questionnaires is included in Annex 2 – Draft questionnaires, displaying each metric to be broken down into more fine-grained questions in order to collect all details and secure careful answering by the respondents. Per metric, the connection to the questions in the draft forms has been made.

In many cases, a metric concerns a valuation by the user (DE, DO, Company representative), expressed in a scale of 5 values. Because DE4A is a research project, each metric of this type will be accompanied by a query of a qualitative nature, allowing the user to share their observations, considerations on the subject, which can be used to motivate the expressed appreciation on the topic/metric. These qualitative responses will be used as input for interviews with the respondents after pilot-runs, and can be used to determine the direction in which the DE4A solution can be improved.

2.2.1 Improve the quality of Company data within the service fulfilment process

The following metrics apply:

Table 5: Metric A1.1

A1	The DE recognizes the company data is of higher quality, more reliable and easier to process when using the OOP TS to retrieve company data directly from the DO.
A1.1	The appreciation the DE expresses on the Company data being (considerably) more reliable, equally reliable or (considerably) less reliable than before. (e.g. being

	available in an electronic and more structured format, being more complete, correct and meaningful).		
What	The appreciation the DE expresses on the reliability of company data, judging from the following perspectives: ▸ Availability in electronic format ▸ Availability in structured format ▸ Completeness of available data ▸ Correctness of available data ▸ Meaningfulness of available data	**What**	Considerably more reliable More reliable Same reliability Less reliable Considerably less reliable
Responsible stakeholder	DE	**Process step**	UC1 - 6.1 Decide on registration and register approval
Type	Quantitative - scale	**Method to gather results**	Annex 2 – Draft questionnaires (DE, items 1A, 1B)
Target	More than 50% of respondents appreciates the reliability (average of all perspectives) of company data as (considerably) more reliable than in the baseline.		

Table 6: Metric A1.2

A1	The DE recognizes the company data is of higher quality, more reliable and easier to process when using the OOP TS to retrieve company data directly from the DO.		
A1.2	The appreciation the DE expresses on processing of the Company data requires (considerably) more, equally or (considerably) less effort than before (e.g. amount of work for interpreting and judging, solving exceptions).		
What	The appreciation the DE expresses on the effort required to process Company data during the approval of the application for a service, judging from the following perspectives: ▸ Interpretation of data ▸ Solving errors and exceptions	**Unit/scale**	Considerably more effort More effort Same effort Less effort Considerably less effort
Responsible stakeholder	DE	**Process step**	UC1 – 6.1 Decide on registration and register approval
Type	Quantitative – scale	**Method to gather results**	Annex 2 – Draft questionnaires (DE, items 2A, 2B, 2C)
Target	More than 50% of respondents appreciates the effort (average of all perspectives) of processing company data as (considerably) less than in the baseline.		

Table 7: Metric A1.3

A1	The DE recognizes the company data is of higher quality, more reliable and easier to process when using the OOP TS to retrieve company data directly from the DO.		
A1.3	The estimated benefit (effort to resolve exception, manually changing data, communication cost) the DE gets from company data that is always up to date, being (considerably) much to (considerably) limited.		
What	The benefits the DE estimates the fact that Company data is always up-to-date, judging from the following perspectives: ▸ Manual effort to maintain Company data ▸ Number of errors and exceptions due to Company data being deprecated ▸ Solving errors and exceptions due to Company data being deprecated ▸ Communication effort and cost to retrieve up-to-date Company data	**What**	Considerably high benefits High benefit Medium benefit Little benefit Hardly any benefit
Responsible stakeholder	DE	**Process step**	UC1 – 6.1 Decide on registration and register approval
Type	Quantitative – scale	**Method to gather results**	Annex 2 – Draft questionnaires (DE, items 3A, 3B)
Target	More than 50% of respondents estimates the benefits (average of all perspectives) of always having up-to-date company data as Medium or (considerably) high benefit.		

Table 8: Metric A2.1

A2	The DE recognizes the method of powers validation to provide reliable proof of the representative being sufficiently authorized to represent the company.		
A2.1	The appreciation the DE expresses on the reliability of the powers validation method, providing more, equally or less reliable proof that the representative is entitled to represent the company. (e.g. is recognized to be authentic, included no language barriers, needs less correcting)		
What	The appreciation the DE expresses on the reliability of powers validation method used in the pilot, judging from the following perspectives: ▸ Authenticity of proof ▸ Accessibility of proof (language, structure) ▸ Correctness of proof	**Unit/scale**	Considerably more reliable More reliable Same reliability Less reliable Considerably less reliable

Responsible stakeholder	DE	**Process step**	UC1 – 6.1 Decide on registration and register approval
Type	Quantitative – Scale	**Method to gather results**	Annex 2 – Draft questionnaires (DE, items 4A, 4B)
Target	More than 50% of respondents appreciates the reliability (average of all perspectives) of the powers validation method as (considerably) more reliable than in the baseline.		

Table 9: Metric A2.2

A2	The DE recognizes the method of powers validation to provide reliable proof of the representative being sufficiently authorized to represent the company.		
A2.2	The appreciation the DE expresses on the reduction in effort to verify the powers of the representative, being much, considerable, little or none (e.g. easier to interpret and verify).		
What	The appreciation the DE expresses on the effort required to verify the powers of the representative, judging from the following perspectives: ▸ Interpretation of data ▸ Solving errors and exceptions	**Unit/scale**	Considerably more effort More effort Same effort Less effort Considerably less effort
Responsible stakeholder	DE	**Process step**	UC1 – 6.1 Decide on registration and register approval
Type	Quantitative – Scale	**Method to gather results**	Annex 2 – Draft questionnaires (DE, items 5A, 5B, 5C)
Target	More than 50% of respondents appreciates the effort (average of all perspectives) of verifying the powers of the representative as (considerably) less than in the baseline.		

2.2.2 Reduce manual work, lower transaction costs and improving enrolment speed

The following metrics apply:

Table 10: Metric B1.1

B1	The user acknowledges the procedure for applying for a service to be effective and efficient
B1.1	The appreciation the user expresses on the effort to effectively complete all elements of the enrolment procedure, varying from (very) much effort to (very) little effort (e.g. collecting company information, language barriers, communication, problem solving, required effort, simplicity of the procedure).

What	The appreciation the user expresses on the effort required to complete the enrolment/registration procedure, judging the following activities: ▸ Collecting company data ▸ Solving language barriers ▸ Providing required data to the DE ▸ Solving problems ▸ Simplicity of the procedure	**Unit/scale**	Very much effort Much effort Reasonable effort Little effort Very little effort
Responsible stakeholder	Company	**Process step**	UC1 – 6.1 Decide on registration and register approval
Type	Quantitative – scale	**Method to gather results**	Annex 2 – Draft questionnaires (Company, items 1A, 1B)
Target	More than 50% of respondents appreciates the effort (average of all perspectives) to complete the enrolment/registration procedure as reasonable (or less) effort		

Table 11: Metric B2.1

B2	The user acknowledges the method to proof their authorisation as effective and efficient		
B2.1	The satisfaction the user expresses on the adequacy of the method used for providing the DE with convincing proof of being entitled to represent a company (e.g. reliability of powers validation method, language barriers, simplicity and robustness of the method).		
What	The appreciation the user expresses on the effort spent to proof to be sufficiently authorized, judging from the following perspectives: ▸ Reliability of method ▸ Accessibility of method (language) ▸ Simplicity of method ▸ Robustness of method	**Unit/scale**	Very adequate Adequate Sufficient Inadequate Very inadequate
Responsible stakeholder	Company	**Process step**	UC1 - 6.1 Decide on registration and register approval
Type	Quantitative - Scale	**Method to gather results**	Annex 2 – Draft questionnaires (Company, items 2A, 2B)
Target	More than 50% of respondents appreciates the effort (average of all perspectives) to complete the enrolment/registration procedure adequate or better.		

Table 12: Metric B3.1

B3	The user acknowledges the duration of completing the online eProcedure activities to apply for a service as acceptable.		
B3.1	The satisfaction the user expresses on several aspects the duration of the process to apply for a service or registration (e.g. company data collection, authentication data, eProcedure activities).		
What	The satisfaction the user expresses on the duration of the following activities in the procedure to enrol/register: ▸ Collect and provide company data ▸ Collect and provide proof of authorisation ▸ Completing the forms in the eProcedure portal ▸ Dealing with Explicit Request & Preview	**Unit/scale**	Very satisfied Satisfied Sufficient Unsatisfied Very unsatisfied
Responsible stakeholder	Company	**Process step**	UC1 - 6.1 Decide on registration and register approval
Type	Quantitative - Scale	**Method to gather results**	Annex 2 – Draft questionnaires (Company, items 3A, 3B)
Target	More than 50% of respondents appreciate the duration (average of all activities) to complete the enrolment/registration procedure as (very) satisfactory.		

Table 13: Metric B4.1

B4	The user saves time and/or cost when completing the eProcedure using the OOP TS, compared to the baseline.		
B4.1	The amount of time and money saved on applying for a service.		
What	The amount of money and time spent by the user, on applying for a service, including collecting evidence and proof of the authorisation, and transportation cost.	**Unit/scale**	Manhours Euro
Responsible stakeholder	Company	**Process step**	UC1 - 6.1 Decide on registration and register approval
Type	Quantitative	**Method to gather results**	Annex 2 – Draft questionnaires (Company, item 4A) (Baseline via desk research)

Target	More than 50% of respondents complete the application for a service with lower cost and/or in less time than compared to the baseline.

Table 14: Metric B4.2

B4	The user saves time and/or cost when completing the eProcedure using the OOP TS, compared to the baseline.		
B4.2	The time spent by the user on the eProcedure portal activities		
What	The amount of time spent by the user, on the following steps executed in the eProcedure portal: ▸ Authorisation and authentication ▸ Collecting and providing evidence ▸ Finalizing registration in forms	**Unit/scale**	Minutes
Responsible stakeholder	DE	**Process step**	UC1 - 6.1 Decide on registration and register approval
Type	Quantitative	**Method to gather results**	Logfiles and/or stopwatch for time measurement
Target	More than 50% of respondents complete the application for a service in less time than compared to the baseline.		

2.2.3 Evaluate the OOP-components supporting the cross-border information flow

The following metrics apply:

Table 15: Metric C1.1

C1	The DO believes the cost and effort for integrating to the DE4A Connector will eventually be outweighed by the benefits.		
C1.1	The estimate of the DO on the benefits of the OOP TS usage (considerably) exceeding, being on par or being (considerably) less than the cost and effort spent to integrate the OOP TS.		
What	The estimate expressed by the DO on the benefits compared to the cost and effort that is required to integrate with the DE4A Connector, considering the following expected benefits for the DO: ▸ Less manual effort for processing ▸ Lower communication cost ▸ Lower risk for error due to manual processing and language challenges ▸ Shorter duration for processing	**Unit/scale**	Considerably exceeding cost and effort Exceeding cost and effort On par with cost and effort Less than cost and effort Considerably less than cost and effort
Responsible stakeholder	DO	**Process step**	N/A

Type	Quantitative - Scale	**Method to gather results**	Annex 2 – Draft questionnaires (DO, items 1A, 1B)
Target	More than 50% of respondents estimate the benefits to (vastly) exceed the cost and effort.		

Table 16: Metric C1.2

C1	The DO believes the cost and effort for integrating to the DE4A Connector will eventually be outweighed by the benefits.		
C1.2	The effort (manhours) involved to integrate the data service to the DE4A Connector. To be provided only if costs are not confidential.		
What	A rough indication of the effort involved to integrate the DO data service to the DE4A Connector. This is an optional metric, in case the costs are confidential.	**Unit/scale**	Manhours
Responsible stakeholder	DO	**Process step**	N/A
Type	Quantitative	**Method to gather results**	Annex 2 – Draft questionnaires (DO, item 2A)
Target	none		

Table 17: Metric C2.1

C2	The DE believes the cost and effort for integrating to the DE4A Connector will eventually be outweighed by the benefits.		
C2.1	The estimate of the DE on the added value of the OOP TS usage (considerably) exceeding, being on par or being (considerably) less than the cost and effort spent to integrate the OOP TS.		
What	The estimate expressed by the DE on the benefits compared to the cost and effort that is required to integrate with the DE4A Connector, considering the following expected benefits for the DE: ▸ Less manual effort for processing during evaluation of the application, as well as fulfilment of the service requested ▸ Lower communication cost ▸ Lower risk for error due to manual processing and language challenges	**Unit/scale**	Considerably exceeding cost and effort Exceeding cost and effort On par with cost and effort Less than cost and effort Considerably less than cost and effort

	▸ Shorter duration for processing ▸ More complete, valuable, consistent and correct data available ▸ Data being always up-to-date ▸ Trustworthiness of the data		
Responsible stakeholder	DE	**Process step**	N/A
Type	Quantitative - Scale	**Method to gather results**	Annex 2 – Draft questionnaires (DE, items 6A. 6B)
Target	More than 50% of respondents estimate the benefits to (vastly) exceed the cost and effort.		

Table 18: Metric C2.2

C2	The DE believes the cost and effort for integrating to the DE4A Connector will eventually be outweighed by the benefits.		
C2.2	The cost (manhours) involved to integrate the eProcedure portal to the DE4A Connector and have additional functionality developed to comply to the SDGR article 14. To be provided only if costs are not confidential.		
What	A rough indication of the effort involved to integrate the DE eProcedure portal to the DE4A Connector This is an optional metric, in case the costs are confidential.	**Unit/scale**	Manhours
Responsible stakeholder	DE	**Process step**	N/A
Type	Quantitative	**Method to gather results**	Annex 2 – Draft questionnaires (DE, item 7A)
Target	none		

Table 19: Metric C3.1

C3	The DPMS believes the cost and effort for integrating to the Mandate Management System will eventually be outweighed by the benefits.		
C3.1	The estimate the DP Member State on the benefits of online powers validation (considerably) exceeding, being on par or being (considerably) less than the cost and effort spent to integrate the MMS.		
What	The estimate expressed by the Data Providing Member State on the benefits compared to the cost, effort and time involved in connecting a Mandate Management System in the	**Unit/scale**	Considerably exceeding cost and effort Exceeding cost and effort

	national eIDAS node, considering the following expected benefits: ▸ Higher reliability of powers validation ▸ Shorter duration of powers validation ▸ Less manual effort for powers validation		On par with cost and effort Less than cost and effort Considerably less than cost and effort
Responsible stakeholder	MS	**Process step**	N/A
Type	Quantitative - Scale	**Method to gather results**	Annex 2 – Draft questionnaires (MS, item 1A)
Target	More than 50% of respondents estimate the benefits to (vastly) exceed the cost and effort.		

Table 20: Metric C3.2

C3	The DMPS believes the cost and effort for integrating to the Mandate Management System will eventually be outweighed by the benefits.		
C3.2	The effort (manhours) involved to integrate the Mandate Management System to the eIDAS node. To be provided only if costs are not confidential.		
What	A rough indication of the cost involved to integrate the Mandate Management System to the eIDAS Connector. This is an optional metric, in case the costs are confidential.	**Unit/scale**	Manhours
Responsible stakeholder	MS	**Process step**	N/A
Type	Quantitative	**Method to gather results**	Annex 2 – Draft questionnaires (MS, item 1B)
Target	none		

Table 21: Metric C4.1

C4	The participating Member States believe the cost and effort for setting up and deploying the DE4A Connector in their national infrastructure will eventually be outweighed by the benefits.
C4.1	The estimation the Member State expresses on the effort, cost and time involved in setting up a node and deploying a DE4A Connector being (considerably) more, on par or (considerably) less than expected.

What	The estimate expressed by the Member State on benefits compared to the cost, effort and time involved in setting up and deploying the DE4A Connector, considering the following expected benefits: ▸ Lower communication cost ▸ Shorter process duration ▸ Reliable communication ▸ Connection to reliable data sources	**Unit/scale**	Considerably exceeding cost and effort Exceeding cost and effort On par with cost and effort Less than cost and effort Considerably less than cost and effort
Responsible stakeholder	MS	**Process step**	N/A
Type	Quantitative - Scale	**Method to gather results**	Annex 2 – Draft questionnaires (MS, item 3A)
Target	More than 50% of respondents estimate the benefits to (vastly) exceed the cost and effort.		

Table 22: Metric C4.2

C4	The participating Member States believe the cost and effort for setting up and deploying the DE4A Connector in their national infrastructure will eventually be outweighed by the benefits.		
C4.2	The effort (manhours) involved to set up and deploy the DE4A Connector. To be provided only if costs are not confidential.		
What	A rough indication of the cost involved to set up and deploy the DE4A Connector. This is an optional metric, in case the costs are confidential.	**Unit/scale**	Manhours
Responsible stakeholder	MS	**Process step**	N/A
Type	Quantitative	**Method to gather results**	Annex 2 – Draft questionnaires (MS, item 4A)
Target	none		

2.2.4 Evaluate solutions to the DBA challenges

The following research queries apply:

Table 23: Metric D1.1

D1	Has the Company Evidence Model proven adequate for cross-border exchange of information on companies for the DBA eProcedures?		
D1.1	The appreciation of the DE on the extent to which the Company Evidence Model fits their needs, being (considerably) less than expected, as expected or (considerably) more than expected.		
What	The appreciation the DE expresses on the extent to which the Company Evidence model satisfies their needs for information on the company, in order to process the request for service adequately, judging the following elements: ▸ Legal entity identification ▸ Legal entity attributes (dates, status etc) ▸ Contact points ▸ Activities ▸ Branch (not included in first pilot iteration) ▸ Address ▸ Information on representative(s)	**Unit/scale**	Very adequate Adequate Sufficient Inadequate Very inadequate
Responsible stakeholder	DE	**Process step**	UC1 - 6.1 Decide on registration and register approval
Type	Quantitative - Scale	**Method to gather results**	Annex 2 – Draft questionnaires (DE, item 8A, 8B)
Target	None (research topic)		

Table 24: Metric D2.1

D2	Have the solutions to validate powers proven adequate for the eProcedures involved in piloting?		
D2.1	The appreciation of the DE on the applicability of the full powers validation method to their services, being (considerably) less than adequate to (considerably) more than adequate.		
What	The appreciation the DE expresses on the extent to which the Powers validation method satisfies their needs, judging the following elements: ▸ Usability for the piloted procedure ▸ Usability for other services of the DE ▸ Validation level (fine-grained)	**Unit/scale**	Less than adequate Less than adequate Adequate More than adequate Considerably more than adequate

Responsible stakeholder	DE	**Process step**	N/A
Type	Qualitative	**Method to gather results**	Annex 2 – Draft questionnaires (DE, item 9A, 9B)
Target	None (research topic)		

Table 25: Metric D3.1

D3	Have the explicit request and preview requirements as specified in the SDGR proven suitable for company eProcedures (representation scenarios)?		
D3.1	The user's appreciation on various virtual scenarios concerning repeatedly using the OOP TS (for updates or requesting evidence with multiple data owners).		
What	The thoughts and considerations of the user when presented various options to use Explicit Request and Preview, in different scenario's like ▸ Explicitly request and preview to collect evidence from multiple DOs ▸ Recurring ER/P in case of updates on Company Information.	**Unit/scale**	None
Responsible stakeholder	Company	**Process step**	N/A
Type	Qualitative	**Method to gather results**	Annex 2 – Draft questionnaires (Company, item 5A)
Target	None (research topic)		

Table 26: Metric D4.1

D4	Have the mechanisms for record matching at the DC an DP proven adequate and effective for the DBA eProcedures ?		
D4.1	The appreciation of the DE on the need to do record matching on Natural Persons and Legal Persons on their part.		
What	The thoughts and considerations of the DE on the need, adequacy and effectiveness to perform record matching on Legal Persons and/or natural Persons (representatives) within their processes.	**Unit/scale**	None
Responsible stakeholder	DE	**Process step**	N/A

Type	Qualitative	**Method to gather results**	Annex 2 – Draft questionnaires (DE, item 10A)
Target	None (research topic)		

Table 27: Metric D5.1

D5	Have the mechanisms for keeping the Company data up-to-date proven adequate and effective for the Data Evaluator?		
D5.1	The appreciation of the DE on the effectiveness of the mechanism to keep Company Data up-to-date in their systems. This metric only applies to the second iteration.		
What	The thoughts and considerations of the DE on effectiveness of the OOP Ts to keep company data up-to-date in their local systems.	**Unit/scale**	None
Responsible stakeholder	DE	**Process step**	N/A
Type	Qualitative	**Method to gather results**	Annex 2 – Draft questionnaires (DE, item 11A)
Target	None (research topic)		

3 Pilot design

In the "use case definition and requirements" project phase the DBA pilot's use cases have been defined and analysed and requirements have been defined. The results have been documented in Deliverable D4.5 [2]. In the current project phase ('pilot planning') the project formulated working assumptions, addressed common topics and constructed the solution architecture for the first use case (Annex 1 – Solution architecture), designed the pilot processes per Member State including the gaps to bridge by the Member States (Annex 4 – Member State specific pilot designs) and designed the company registration evidence type (Annex 3 – XSD of company registration evidence type).

This chapter specifies the design of the DBA pilot:

- The pilot scenarios, use cases and interaction patterns defined in D4.5 [2] (3.1).
- The scope of the first and second iteration to specify the MVP and the final scope (3.2)
- The major design decisions at pilot level that guide the functionality and technology needed to pilot (3.3)
- The generic pilot process, based on the reference intermediation pattern of the project start architecture [3] (3.4)
- The data model design that specifies the company registration evidence type (3.5)
- The common components that are needed for implementing the eIDAS network and the OOP TS (3.6)
- The specific components of the data evaluator (eProcedure portal) and the data owner (data service) (3.7)

The sections 3.4, 3.5, 3.6 are extracts from the DBA solution architecture (Annex 1 – Solution architecture). The solution architecture extends the PSA to specify the common solution and the Member State specific solutions needed for piloting the first iteration. The solution architecture starts with a DBA-analysis of the reference architecture for the intermediation pattern (impact, compliancy and deviations), then identifies the components needed to implement the functionality required, formulates the interfaces expected and finally defines the requirements for each of these components.

In this chapter, the structure of the information from the solution architecture has been adapted to better align with the document structure of the other DE4A pilots.

The text in this chapter assumes the reader is familiar with the D4.5 deliverable [2]. Several concepts, terminology, etc. are assumed known to the reader. This chapter is better read based on a prior familiarity of the reader with D4.5.

3.1 Pilot scenarios, use cases and patterns

This section provided a quick recap of the pilot scenarios, use cases and interaction patterns from D4.5 [2].

3.1.1 Pilot scenarios

Deliverable 4.5 describes the pilot scenarios that the pilot partners will pilot. Each scenario specifies the eProcedure portal that will be using the cross-border evidence[4]:

[4] DBA2 and DBA3 are Belgian pilot scenarios that have been removed from D4.6.

- **Pilot scenario DBA1: USP.gv.at**: USP (Business service portal) includes several services (starting a business online) that are not restricted to Austrian companies. In order to qualify for the service, the company must provide the necessary data and needs an entry in one of the registers. The stored company data must be kept up to date. This scenario entails a non-Austrian company that applies for a service carried out by usp.gv.at. Currently, this is a semi-automated process, due to a necessary application process to identify organisation and the approval of the powers (of representation). In the pilot process, the company can apply for these services through an easy online form, which will trigger an automatic registration to most of Austria´s online services. Additionally, as best-effort, Austria will make this application process fully automated, so the company does not have to supply information to USP that is already known to a data provider in another Member State (the 'native' country of the business) in application of the Once-Only Principle. In either case, USP is able to retrieve this information from the data provider and keep the information up to date. The minimum goal of the scenario is to digitalise this process. The maximum goal is to implement a fully automated process.
- **Pilot scenario DBA4: MijnRVO.nl:** RVO offers several services for companies that are not restricted to Dutch companies. In order to qualify for the service, the company must provide the necessary data. Besides the specific data required to qualify for the service, RVO also requires general data of the company itself, for identification, communication and compliance purposes. RVO stores this company data in a central ('customer') registry that is used for most RVO services. The stored company data must be kept up to date. This scenario entails a non-Dutch company that applies for a service carried out by RVO.nl. In this process, the company does not have to supply information to RVO that is already known to the data provider in a Member State (the 'native' country of the business) in application of the Once-Only Principle. RVO.nl is able to retrieve this information from the data provider and keep the information up to date.
- **Pilot scenario DBA5: Verksamt.se (PSC):** Companies that want to do business in Sweden will be registered by the Swedish Companies Registration Office through the Swedish Point of Single Contact Verksamt.se. The portal presents companies with information and e-services. There is no information stored within the portal. The source of company information will be the respective authority. There is an opportunity to do a tax registration, with underlying processes such as registering the company at Skatteverket, registering as an employer, paying VAT, applying for F-tax and so on. It is also possible to register a branch of a foreign company, by using the service provided by Bolagsverket. Verksamt.se is designed to provide a unified process for the foreign company to be able to register a branch and then make a tax registration in Sweden, depending on how the company intends to conduct business operations in Sweden. Verksamt.se also supports foreign companies, whether they conduct business from a permanent establishment in Sweden or only want to register for tax purpose (not register a branch), for selected processes e.g. to register as an employer or F-tax. F-tax can be applied for without liability to pay income tax, but serves as a proof that the company has no tax liabilities in the country of registration and is therefore considered serious.
- **Pilot scenario DBA6: eService Layer at portal.onrc.ro:** Companies wishing to do business in Romania will be registered by the National Trade Register Office. The registration of the company of a single trader, company or branch of a foreign company is done using the online service portal eService Layer at portal.onrc.ro and leads to the registration in the register of Romanian companies (ONRC). The registration also leads to registration with the Romanian tax agency - ANAF. As part of the registration with the tax agency, the company can (if applicable) register the permanent unit and register for VAT.

3.1.2 Use cases

D4.5 [2] defines two use cases[5]:

1. Use case 1: Starting a business in another Member State

   At the core of this use case is the fulfilment of procedural obligations to do business in another Member State, especially the initial registration of a company at an eProcedure portal (AT, NL and RO pilot scenarios), opening a branch and the assessment of tax duties in the destination Member State (in the Swedish pilot scenario). In this use case, a company representative authenticates to the eProcedure portal, registers the company at the portal and applies for a service[6].

2. Use case 2: Doing business in another Member State

   This use case focusses at assessing the consequence for active eServices in case of a business event, e.g. company goes bankrupt, company stops its activities, company merges, etc. The data consumer may subscribe to notifications on selected business events. In case such an event occurs, the data provider notifies the data consumer. The data consumer needs to assess the relevance of the notification. It can then for example request the updated data from the data provider or decide it doesn't need any additional data. Furthermore, the data consumer may intervene in an active eService (e.g. stop periodical grants or impose a tax obligation). The data consumer may also use the notifications as input to a general fraud prevention and protection procedure.

Table 28: Pilot scenarios and use cases

Pilot scenario #	Pilot scenario short name	Use case to pilot	
		UC1: starting a business in another Member State	UC2: Doing business in another Member State
DBA1	USP.gv.at	x	
DBA4	MijnRVO.nl	x	x
DBA5	Verksamt.se (PSC)	x	x
DBA6	eService Layer at portal.onrc.ro	x	x

5 The description of the use cases has been refined after delivery of D4.5.

6 Sub use case 1a: the enrolment of a foreign company in a relationship database of a service provider in another Member State. Sub use case 1b: the enrolment of (a branch of a) foreign company in the business register of another Member State.

In the table below, an overview is given of the eServices within the scope of the pilot scenarios and in the following table the correspondence of the pilot scenarios to services of the SDGR is marked.

Table 29: Pilot scenario services

Pilot scenario #	Pilot scenario short name	eServices involved
DBA1	USP.gv.at	Enrol company to apply for services via USP.gv.at (up to 60 services) regarding social security, first year of running the business, etc.[7]
DBA4	MijnRVO.nl	Enrol company to apply for services: • import / export of agricultural products • production of agricultural products / services
DBA5	Verksamt.se (PSC)	Tax registration: F-tax, employer taxes, vat, permanent establishment taxes
DBA6	eService Layer at portal.onrc.ro (ONRC)	Registration of a company

Table 30: Pilot scenario to SDGR alignment

Procedures	Pilot scenario			
	DBA1 AT	DBA4 NL	DBA5 SE	DBA6 RO
SDG Annex II – Starting, running and closing a business				
Notification of business activity	X	X	X	X
Permission for exercising a business activity	X	X	X	X
Changes of business activity	-	X	X	X
Termination of a business activity not involving insolvency or liquidation procedures	-	X	X	X
Submitting a corporate tax declaration	-	-	-	-
Other regulation				
Company law package (2019/1151, 2019/2021)	-	-	X	-
Service directive	-	X	-	X

Please note that the second use case goes beyond the SDGR in implementing the updating mechanism. The updating mechanism may be implemented specifically for the procedures mentioned in the table above (to intervene in eServices whenever necessary, e.g. SDGR procedure "retract a permission for exercising a business activity"). But the DBA data evaluators will be using the updating mechanism of use case 2 in a more general way as well to intervene in any eService (also non-SDGR) and to prevent and/or detect fraud. In those cases that are not covered by the SDRG, a legal question arises regarding the use of the OOP TS for this purpose. For piloting purposes this is not blocking as the pilot will

[7] Not all services are available for every company. Service providers on USP are whitelisting the companies which are allowed to use it. But others like (electronic invoice etc.) are automatically available for use for every company.

implement the DE4A OOP TS and not the SDGR OOP TS that he commission will provide in 2022. Piloting the second use case will provide valuable input to the European Commission on the use of the OOP TS beyond the SDGR, based on the information needs of the data evaluators. This input may be used for revision of the SDGR in the future to better support the information requirements of the data consumers providing SDGR procedures.

3.1.3 Interaction patterns

The use cases implement three interaction patterns:

1. The intermediation pattern: for fetching company data at the request of the user from the business register directly.
2. The subscription and notification pattern: for allowing data consumers to subscribe to updates on company data and to receive notifications of changes in company data[8].
3. The lookup pattern: for providing a lightweight alternative to the intermediation pattern for fetching (possibly updated) company data from business registers with direct service calls. This pattern focusses on high frequency, highly standardised data requests to data sources which the data consumer is familiar to.

The diagram below shows the mapping of the use cases to the interaction patterns.

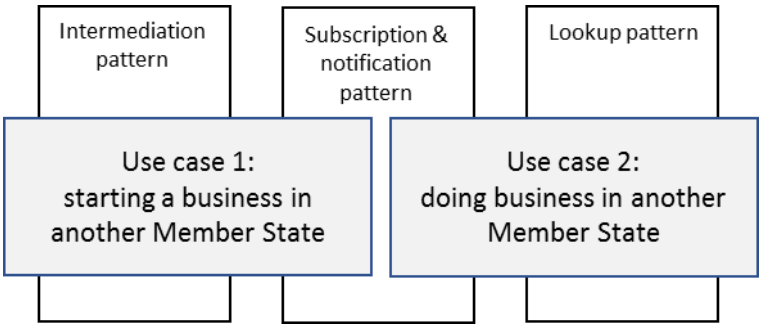


Figure 2: Mapping of use cases to interaction patterns

The first use case – in D4.5 [2]– ends with a subscription to receive notifications of business events of the company involved. From a logical process point of view, this is strongly intertwined with the company registration: subscribing to notifications follows directly after registration of the company at the eProcedure portal, before the process ends. Hence it is an integrated part of the first use case[9]. From an interaction pattern perspective, the subscription to notifications does not belong to the intermediation pattern but to the subscription & notification pattern. The first part of the subscription and notification pattern deals with managing subscriptions, the second part with sending notifications once a business event took place. So, the first use case spans two interaction patterns.

Something similar goes for the second use case. This use case starts with receiving the notification from the data provider. After assessing the notification, the data consumer may decide to request

[8] Depending on the perspective, you should read "allowing the company representative to subscribe to automatically sending company data updates to the data consumer".

[9] Please note, that section 3.2 specifies the scope of the first and second pilot iteration. Subscribing to notifications is included in the second pilot iteration.

updated data from the business register via the lookup pattern. So use case 2 involves the subscription & notification pattern as well as the lookup pattern.

Use case 1 could be implemented with the Lookup pattern as well to retrieve the evidence (instead of the Intermediation pattern). This is no project priority and therefore has not been depicted in the diagram above. Likewise, the retrieval of updated company data - after receiving a notification - can be implemented with the intermediation pattern as well (instead of the Lookup pattern). This is no project priority either and has not been depicted in the diagram above.

3.2 Minimum viable product (first iteration) and final scope (second iteration)

The DE4A Description of Action defines two pilot iterations: the first pilot iteration and the second pilot iteration. In order to respect timelines and to allow for swift piloting, the DE4A project interpreted the first iteration as the piloting of the minimum viable product.

3.2.1 First iteration (Minimum Viable Product)

The DBA first iteration will pilot the intermediation pattern for Use Case 1 in a controlled piloting environment: aiming at piloting with real users and real data. The UC1 process steps that belong to the subscription & notification pattern (subscribing a company registered to notifications on the company) are excluded from the first pilot iteration.

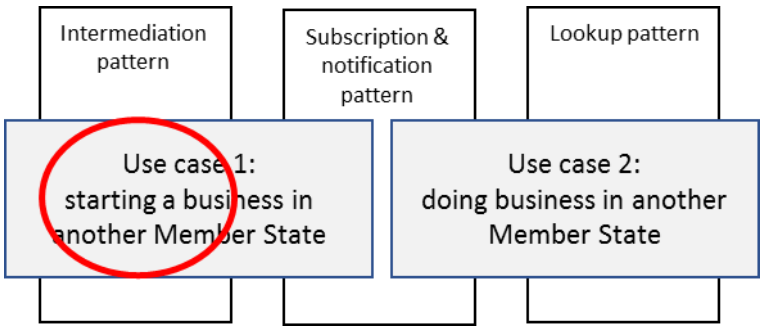


Figure 3: Simplified view of first iteration scope

The first pilot iteration includes:

- Intermediation pattern, see section 3.1.3
- Authentication on behalf of a company (including company identification), see section 3.3.4
- Full Powers validation (no fine grained powers validation), see section 3.3.5
- Simple explicit request & preview functionality, see section 3.3.7
- One evidence type: company registration evidence, see section 3.3.8
- Uninterrupted processes only (no save and resume)

In the first pilot iteration the pilot scenarios that were defined in D4.5 [2] and that cover use case 1 will be piloted. Any choices and remarks that apply for a specific pilot scenario are displayed in the table below.

Table 31: Pilot scenarios specifics for MVP

MS	Pilot scenario	MVP specifics
AT	USP.gov.at	▸ The natural person and company need to be registered in national registries of the data consumer before applying for a service at the eProcedure portal. ▸ The eProcedure portal has to wait approx. 30 minutes to receive the information from national registries. Hence, the user has to re-authenticate to the eProcedure portal 30 minutes later to (continue to) apply for the eService[10]. ▸ Natural person may need to re-authenticate with a local eID at the eProcedure portal after registration in national registries[11].
NL	MijnRVO.nl	▸ RVO intends to integrate the pilot as much as possible in currently operational process. Hence, a foreign company authenticating may already be registered at the eProcedure portal. To prevent multiple registrations for one company, RVO will do record matching for already registered companies prior to the start of the pilot. For each matched company RVO will add the eIDASLegalPersonIdentifier to easily find the company after authentication of its representative.
RO	portal.onrc.ro	▸ Romania will setup a dedicated portal for piloting the first iteration. ▸ Romania will implement an IdP specific for piloting and connect this IdP to the dedicated eIDAS node. Only legal representatives (having full powers) of a company will receive credentials, this preventing the need for real time powers validation.
SE	Verksamt.se	▸ Sweden will setup a dedicated portal for piloting. ▸ Will be piloted without applying for tax at Skatteverket in the MVP This will be covered in the second iteration.

3.2.2 Second iteration

The second iteration functionally extends the Intermediation pattern, adds the subscription & notification pattern and adds the Lookup pattern.

10 The intermediation pattern is (and remains) uninterrupted. As soon as the company needs to be registered in AT first, the process of providing the eService stops. The user has to start the process from the beginning 30 minutes later. This time, the prerequisite of company registration in the national registry has been fulfilled and the process can be finalised.

11 This is a point of further examination by AT: Does the representative must have an Austrian eID? If so, when and how is it obtained? Can the procedure be performed fully online from the requesting company from another MS?

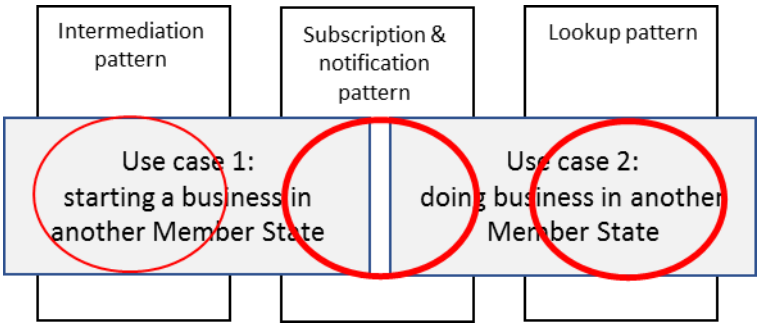


Figure 4: Simplified view of second iteration scope

The second iteration functionally extends the Intermediation pattern to:

- Add domestic evidence to the Company Registration Data evidence and the preview function (UC1)
- Add fine grained powers validation (UC1)[12]
- Add explicit request token as proof of explicit request[13] (UC1)
- Add more advanced data lay-out options for (the structured data in) the evidence received and add option to preview the domestic evidence (UC1)
- Include other functional improvements still to be defined in evaluating the first pilot iteration (UC1)
- Assessment of F-tax by Skatteverket (SE, UC1).

The second iteration adds the subscription & notification pattern:

- Simple subscription function (UC1)
- Including explicit request for subsequent requests so the user can request the use of the OOP TS for more than one evidence requests – this is needed for using the OOP TS to notify the data evaluator in case of a business event (UC1)
- Support for notification on business events of a company (UC2)

The second iteration adds the Lookup pattern:

- Lightweight direct retrieval of company data (UC1 and UC2)
- From limited sources known in advance (UC1 and UC2)

In the second pilot iteration the piloting Member States will implement the lookup pattern for retrieving the updates company data. The intermediation pattern will not be used to retrieve the updated company data as piloting the intermediation pattern is included in the first pilot iteration already.

Please note that the remainder of this document is for the first pilot iteration (MVP) only, unless stated otherwise.

12 Austria will add fine grained powers validation on a best effort basis.

13 With the token the data consumer proves to the data provider that the user requested the transfer of evidence.

3.3 Major design decisions at pilot level

As part of this project phase, the project team concluded on several important topics. This section presents these topics and the main conclusions. Many details have been left out of this section in order to be to-the-point for this document's purpose. The details of these topics are part of several project internal documents available on request.

3.3.1 Two Member State intermediation scenario

The DBA pilot will be restricted to the two Member State scenario: one Member State operates as data consumer (hosting the data evaluator and data requestor roles) and one Member State operates as data provider (hosting the data owner and data transferor). Authentication[14] and powers validation takes place in the data providing Member State with an eID of that Member State.

In the first pilot iteration the DBA pilot will implement only the intermediation pattern. After authentication, the user will interact with the data consumer only (more specific: the data evaluator). There will be no user interaction at the data provider / data providing Member State for retrieving the evidence. The previewing of the evidence will be handled by the data evaluator as well.

3.3.2 Real eProcedures and simulated eProcedures

Member States involved in DBA facilitate the pilot in different ways. E.g. some pilot partners will fully integrate the pilot in their real eProcedures and others will use a simulated eProcedure portal. The DBA pilot defined three options for the eProcedure portal:

1. Simulated eProcedure:

   In this scenario the eProcedure will be simulated only. Member States may facilitate this by:

   a. Using a test environment for running the pilot, e.g. pre-production.
   b. Using a simulated eProcedure portal. Member States using a simulated eProcedure portal will do so in order not to interfere with regular production services. The simulated eProcedure portal will be used for piloting only, without the result of a procedure having any impact on the (software of the) real eProcedure portal.

2. Real eProcedure:

   a. Involving company registration only. In this scenario the Member State pilots the registration of the company into the eProcedure portal's registry in a live-environment. The company may apply for a follow-up eService, but will not finalise the application. This way, the legal consequences for the company are absent or very limited the least. The Member State can hereby pilot real company registration, even with companies that have no intention to start or do business cross-border. The main advantages of this scenario are the increased possibility to involve real companies in piloting and the absence of procedure-exceptions or extensive data clean-up afterwards by the data evaluator.
   b. Including a follow-up eService. In addition to the real company registration at the eProcedure portal (scenario 2), in this scenario the company also successfully applies for, by example, a subsidy, F-tax, or any other service following a successful company registration.

The table below shows the type of eProcedure that will be supported in the first pilot iteration.

[14] "authentication" meaning: confirming the identity of the user. Of course, this is upon request of the user interacting with the data evaluator.

Table 32: Piloting simulated or real eProcedures

MS	Pilot scenario	eProcedure Portal to pilot (data evaluator role)
AT	USP.gov.at	Real eProcedure involving company registration only (2)
NL	MijnRVO.nl	Real eProcedure involving company registration only (2)
RO	portal.onrc.ro	Simulated eProcedure
SE	Verksamt.se	Simulated eProcedure

3.3.3 Real data and fictitious data

When involving real companies, the pilot partners will use real data as well. When using fictitious companies, the DBA pilot uses fictitious data as well.

1. Fictitious company data: company information regarding a non-existing company.
2. Real company data: company information regarding an officially registered company.

For piloting, combinations are imaginable, like using fictitious companies and real data. These combinations have not been considered in this deliverable though. Piloting real companies means using real company data. Piloting fictitious companies means piloting with fictitious data.

Simulated eProcedures may accept real users and real data. In case the Member State does not pilot with a real eProcedure (SE and RO), they should accept real users and real data in their simulated eProcedures to meet the DE4A requirements. But, because of the use of real data in a simulated environment, there should be sufficient safeguards to properly protect the companies' data in the simulated eProcedure. E.g. access to the simulated portal should be restricted. When simulating the eProcedure is just a step-up to pilot real eProcedures, there is no need to accept real users and real data in the simulated procedure (AT and NL). AT and NL will pilot with real eProcedures that – by definition – accept real data. In real eProcedures no fictitious data is accepted.

The table below shows whether the *data evaluator* accepts real users and real data. Please note, in this table "accept" should read: allow use of real company data provided by other Member States in the eProcedure portal to pilot. E.g. SE will accept real companies and real company data in the simulated eProcedure *as data evaluator* (although SE will not provide any real company data itself).

Table 33: Data evaluator pilot capabilities

MS	Pilot scenario	Accept fictitious data in portal to pilot (data evaluator role)	Accept real data in portal to pilot (data evaluator role)
AT	USP.gov.at	No	Yes
NL	MijnRVO.nl	No	Yes
RO	portal.onrc.ro	Yes	Yes
SE	Verksamt.se	Yes	Yes

Almost all data owners will provide fictitious company data (1) to start with and real company data (2) for piloting real eProcedures. The table below presents the data that the data owners will provide to data evaluators cross-border. E.g. Sweden provides fictitious company data (and no real data) to the other Member States.

Table 34: Data provider pilot capabilities

MS	Data provider	Provide fictitious company data	Provide real company data
AT	BMDW	Yes	Yes
NL	KVK	Yes	Yes
RO	ONRC	Yes	Yes
SE	BVE	Yes	No

Furthermore:

- The DBA pilot will rely on the national and EU legislation that is already in place for use of identity data (eIDAS) and company data (Service Directive, Company law package, Common agricultural policy, etc.) in the eServices to pilot.
- The DBA pilot assumes the SDGR provides sufficient legal basis to pilot the OOP technical system with real data in anticipation of (this part of) the SDGR going into effect end of 2023[15]. To confirm this point of view, pilot partners will sign a Memorandum of understanding for cross-border piloting.
- The DBA pilot will inform the user – as part of the "explicit request" - that the OOP TS will be used for exchange of data before the SDGR is into effect at the moment the initial pilot starts. The user in all cases has the option not to proceed or to use the current in-person procedure for company registration.
- For AT and NL cases, users should also be informed that there will be no follow-up service so there are no legal consequences of company registration.

3.3.4 eIDAS network and non-notified eIDs

Specific to the DBA pilot, and an important part of the DBA pilot, is the need to validate the powers of the person representing the company and the use of non-notified eIDs. Both aspects require additional eIDAS functionality to include in the pilot.

Dedicated pilot network

In order to support these functionalities while not interfering with the regular eIDAS production, pilot partners will set up a separate pilot network of eIDAS nodes: the dedicated eIDAS pilot network. The dedicated eIDAS pilot nodes are separate from the regular eIDAS nodes in order not to interfere with regular eIDAS use. This approach has explicitly been contemplated in planning milestones and in the Member State pilot management plans.

[15] The SDGR requires Member States to develop the system as of the entry into application in October 2018; and the SDGR requires the system to go live on 12 December 2023. We don't consider it a reasonable interpretation of the law to say that a completely untested system goes live on 12 December 2023 without ever having seen real data. From a data protection perspective, that implies that we argue that piloting the SDGR is part of the task of the authorities in the run-up to 12 December 2023.

Table 35: Member State overview of eIDAS nodes

MS	Implement dedicated pilot node	Use CEF reference software	eIDAS specification to implement
AT	Yes	Yes, version 2.4	1.1
NL	Yes	Yes, version 2.4	1.1
RO	Yes	Yes, version 2.4	1.1
SE	Yes	No	1.2

The use of national eID in the data consuming Member State (so non-eIDAS authentication) is not relevant for piloting DBA and hence not in scope of the pilot.

Use of eIDASLegalPersonIdentifier

The eIDAS attribute profile [4] defines the attributes to exchange over the eIDAS network. To uniquely identify a company, the attribute profile specifies the eIDASLegalPersonIdentifier. The attribute profile describes the purpose of the attribute and its formatting, but does not prescribe the specific type of identifier to populate the eIDASLegalPersonIdentifier with. A Member State may use for example the EUID (definition by BRIS) as value for the eIDASLegalPersonIdentifier, but may select any other company identifier as well. E.g. NL will use the national Chamber of commerce number (KVK nummer) to identify the company.

An example of an eIDASLegalPersonIdentifier is RO/AT/02735442Z: Romanian Company with company identifier 02735442Z applies for a service in Austria.

For proper record matching at the data owner, the DBA pilot partners agreed to include in the eIDASLegalPersonIdentifier a company identifier that the data owner can use to uniquely find the company involved. E.g. with the KVK number that the NL will provide to the data evaluator in the authentication process, the Dutch KVK can easily find the company involved once it receives a request for this evidence from the data evaluator. More information on record matching has been included in section 3.3.6.

Use of non-notified eID

Most of the participating Member States do not operate an eIDAS-notified eID yet (AT, SE and RO). All participating Member States agreed to accept the non-notified eID for piloting purposes though. The smaller scale piloting as well as the voluntary participation by the companies justify use of non-notified eIDs. By using a dedicated pilot network, pilot partners will connect non-notified eIDs as if they were notified. Use of these non-notified eIDs is – by the nature of the pilot network – restricted to the partners involved in piloting.

Table 36: Member State overview of using and accepting eID

	Has notified eID	eID to use for piloting	Type of test credentials to use	Level of Assurance[16]	Accepts non-notified eID for piloting
AT	No	Bürgerkarte/Handysignatur	t.b.d.	N/A	Yes
NL	Yes	eRecognition	OTP token / app	substantial	Yes

[16] eIDAS defines the Levels of Assurance “substantial” and “high”.

RO	No	Dedicated IdP	t.b.d.	N/A	Yes
SE	No	t.b.d.	t.b.d.	N/A	Yes

Need for powers validation

The DBA pilot requires not only the identification of the company, but also the validation of the user's powers to represent the company. For identifying the company, Member States may need to connect an Attribute Provider. For validating powers, the Member States need to connect their Mandate Management Systems. Furthermore, in the second iteration, Member States need to extend their eIDAS implementation with additional (SEMPER) attributes to allow for fine-grained powers validation (and communication). All this requires adapting the eIDAS node, without using the added functionality in the regular eIDAS flows (the non-pilot flows). Pilot partners prefer to use a dedicated pilot node for this.

3.3.5 Powers validation

Regarding powers validation, the DBA pilot implements the following principles:

- validate powers online;
- validate powers in the Member State of powers registration;
- trust the outcome of powers validation abroad;
- validate powers each time a user authenticates;
- use the SEMPER-standard for describing the scope of powers to be validated (second iteration).

Concerning powers validation, the piloting partners decided:

- to use currently operational sources of mandate information instead of building new mandate management solutions to pilot[17];
- to focus on validating full powers for the first iteration and fine grained powers in the second iteration;
- not to allow for specific limitations to powers, e.g. joint powers;
- not to charge fees for validating powers;
- to use the eIDAS legal person attributes to identify the company represented;
- to use SEMPER for an explicit powers declaration in the second iteration.

[17] Integration of these mandate management systems is foreseen for the first pilot iteration in specific milestones and has been contemplated in the MS specific plans.

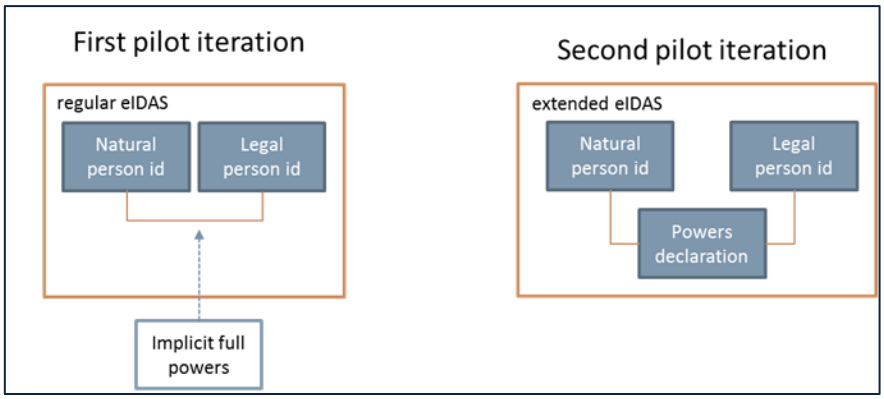


Figure 5: Powers validation in DBA piloting iterations

Table 37: Member State overview of powers validation

MS	Pilot full powers in first pilot iteration	Pilot more fine grained powers in second iteration	Use SEMPER extension in second iteration
AT	Yes	Yes	Yes
NL	Yes	Yes	Yes
RO	Yes, by issuing dedicated pilot credentials to legal representatives (having full power) only.	Yes	Yes
SE	Yes	Yes	Probably not

3.3.6 Record matching

Natural person record matching

The company is the entity concerned in the DBA pilot. The main focus of the pilot participants is on recognising the company, although matching the natural person representative is needed in AT for inclusion in the national registry of persons (data evaluator role). In AT, the data evaluator can only fulfil the eProcedure after registering the natural (and the company) in the national registry. None of the data providers require record matching on the natural person.

Company record matching

For recognising the company at the *data provider* for retrieving the evidence, the pilot partners agreed to use the national business register number as eIDASLegalPersonIdentifier. In the 2 Member State scenario – which the DBA pilot is limited to – this guarantees unique identification of the company by the national business register number received via eIDAS, without the need for any company record matching on any of the additional attributes[18].

Some *data consumers* (AT and NL) require record matching on the company to find companies (that apply for an eService) registered without an eIDASLegalPersonIdentifier, prior to the pilot start. Record

[18] The data providing Member State sends the national company identifier in the eIDAS process towards the data consumer. The data consumer returns this value in the evidence request to the data providing Member State.

matching may be done upfront (NL, to add the eIDASLegalPersonIdentifier to already registered foreign companies before the pilot starts) or in runtime at login (AT). Some data consumers implement a dedicated portal for piloting starting with an empty company registry. These Member States will register the eIDASLegalPersonIdentifier from the start, so no additional record matching needs to be implemented. In any case, this matching process is DC-specific. It does not need any additional common components, nor does it require additional eIDAS attributes.

Table 38: Member State overview of record matching

MS	DC matching on company[19]	DC matching on natural person	DP matching on company[20]	DP matching on natural person
AT	Yes	Yes	Yes, using eIDASLegalPersonIdentifier	No
NL	Yes, probably prior to pilot	No	Yes, eIDASLegalPersonIdentifier	No
RO	No, due to use of pilot eProcedure portal and registry	No	Yes, eIDASLegalPersonIdentifier	No
SE	No, due to use of pilot eProcedure portal and registry	No	Yes, eIDASLegalPersonIdentifier	No

3.3.7 Explicit request, preview & logging

In the DBA pilot the data evaluator will secure the explicit request from the user and present the user with the preview. Contrary to the user supported intermediation pattern, the DBA pilot will not implement a preview at the data provider. There will not be any user interaction with the data provider.

Although several exceptions exist to the need for an explicit request and the option to preview the evidence in the SDGR, the DBA pilot will implement both functions without applying these exceptions (explicit request will always be secured and preview will always be displayed). This way it reduces complexity, improves user centricity and adds project value in allowing maximum user feedback on both functions. In the MVP, the explicit request and preview will be implemented in a simple form to focus efforts on the pilot priorities (use of eIDAS on behalf of a company and the exchange of company data evidence).

As the explicit request & preview will be implemented in a simplified form, there is no need for request tokens as proof of explicit request and extensive logging of user activities in the first pilot iteration. Logging is needed for solving errors as they occur. Furthermore, there is no need for advanced layout of the data to preview in the first pilot iteration. The canonical Company registration evidence will be presented for preview as a simple overview These functionalities may be added in the second iteration (depending on the evaluation of the first iteration). In any case, the second pilot iteration will add functionality to present the domestic evidence as addition to the canonical evidence.

19 To access an eService.

20 To retrieve the company data evidence.

3.3.8 Company registration evidence

The detailed design of the pilot process has confirmed that all pilot partners can work with just one single company registration evidence type that will be provided free of charge by the data owner. There is no need for introduction of additional evidence types for this pilot. The company registration evidence type is characterised by:

- A small number of mandatory attributes and a large number of optional ones to allow all data providers to construct the evidence.
- One request will be fulfilled with exactly one response[21].
- Data will not be requested from multiple data providers at once ('multiple evidence cases').
- The company registration evidence is fully structured data.
- In the second iteration, domestic evidence (an image or PDF) may be included within the evidence structure (as attributes), but this will not be piloted in the first iteration.
- BRIS has been taken into account in the definition of the evidence type for its semantic aspects. The main aspects of this alignment are that conform BRIS the EUID is used as identifier for the company and that the value list for the company status is conform BRIS.
- Where feasible is aligned with the core vocabularies. Main aspects of the alignment with the core business vocabulary is the use of the element Legal Entity Legal Name including the support for multiple languages. The core business vocabulary object Address could not be used because it doesn't match the DBA requirements. DBA prefers to have one complete address per language instead of one address with repeating elements (e.g. street names, cities), one for each relevant language.

The main elements of the company registration evidence type are:

- Legal entity identification
- Legal entity attributes
- Contact points
- Activities
- Branch (not included in first pilot iteration)
- Address

The attribute definition of the Company Registration Data evidence is included in section 3.5. In section 3.7 is described in which component the Member States transform their domestic evidence to the company registration evidence and vice versa.

3.4 Generic process for the Pilot and Solution Architecture

The first version of the pilot process has been analysed and specified in the D4.5 deliverable [2]. Subsequently, the processes have been further detailed by each of the pilot partners for their specific situation, required functionality has been specified, the processes have been aligned to the project start architecture [3] (that has been designed after the delivery of D4.5), the solution architecture has been defined (see Annex 1 – Solution architecture), national customisations and integration activities and gaps have been identified (see Annex 4 – Member State specific pilot designs). This section specifies the interpretation of the reference pattern for the DBA pilot (see project start architecture, section 4.2.2 business process collaboration [3]).

21 One request will be fulfilled with exactly one response. Data will not be requested from multiple data providers at once ('multiple evidence cases').

Points of attention when comparing to the initial pilot process design from D4.5 [2] and the Member State specific detailed process designs (based on the solution architecture in Annex 1 – Solution architecture):

- Use case 1 cannot be implemented fully with the intermediation pattern. The subscribing of a company for updates is not part of the intermediation pattern and will not be included in the first pilot iteration.
- The process "request authentication" (DE) in the DBA pilot includes also (1) requesting the identifying attributes of the company represented and (2) requesting a powers validation. This does not contradict to the reference pattern but needs highlighting because of its importance for the DBA pilot.
- The process "provide authentication details" (user) in the DBA pilot includes also identifying the company that the user wants to represent. This may be done by entering the company identifier, by selecting the company from a list of companies the user has powers for or by directly selecting the mandate to use. In any case, the user's powers to represent need to be validated. The implementation is Member State specific and does not need harmonisation for piloting.
- The process "establish user identity" (user) in the DBA pilot refers to record matching on the company represented as outlined in section 3.3.6.
- The process "redirect user to another channel" (user) in the DBA pilot means: allowing the user to register the company by using currently existing in-person or paper-based procedures. These current processes for registering a company remain available to the user and are out of scope for piloting.
- The process "determine procedural requirements" and "determine required cross-border evidence" have been simplified for the DBA pilot to reflect the decision to use just one evidence type. The procedural requirements and evidence to request are fixed in the scenario of each pilot partner.
- Saving and resuming the eProcedure (user) will not be supported in the DBA pilot.
- "Provide public service" in the DBA pilot initially means registering the company at the eProcedure portal. Registering the company in all pilots' scenarios is the pre-requisite for applying for eServices, like assessment of tax duties, filing tax and applying of a subsidy or grant.

Each Member State has some specifics in the process to pilot. The process for each pilot has been elaborated in the Member State specific design sections, see Annex 4 – Member State specific pilot designs. The main specifics have been summarised in the table below.

Table 39: Member State process specifics

MS	MS process specifics
AT	The company and its representative need to be registered in the AT national registries before the representative can apply for a service in the eProcedure portal. Fetching the data into the eProcedure portal takes some time (approx. 30 minutes). Therefore, the process will be interrupted. The representative needs to re-authenticate at the eProcedure portal to continue the process after a short waiting period.
NL	RVO uses several components to handle company identification and registration (ABA, IOR, REBUS, ERB). Registering a foreign company requires several system-interactions. These will be implemented in a real-time process though.
RO	The company representative – in real life – should create an account at the eProcedure portal before starting the eIDAS and OOP TS flows. For piloting purposes, this step has been left out.

MS	MS process specifics
SE	Sweden intends to incorporate the preview in the company registration form (instead of two steps: (1) preview and (2) registration of the branch). This provides the pilot the opportunity to explore how this works out from a legal and user centricity perspective[22].

3.5 Data model design

As described in section 3.3.8 the DBA pilot uses one evidence type for the exchange of data: Company Registration evidence. The design of the company registration evidence type as defined in D4.5 [2] has been improved together with WP3 to better incorporate existing standards. Furthermore, the relevance of all company data attributes have been re-assessed by the pilot partners, leading to refined data definitions. As a result, the company information evidence type is aligned with the ISA[2] Core Vocabularies, in particular with the Core Business Vocabulary (CBV), and thereby with the TOOP RegisteredOrganisation ontology (which is also based on the CBV). Also BRIS concepts are used where applicable. Please see D3.3 (chapter 5.4.2 and Annex XI), D3.5 (chapter 3.3) Table 40: Company registration evidence type below for details on this alignment.

The final data definition is depicted below in a visual representation as well as in a table with all details on the attributes. The corresponding XSD has been included in Annex 3 – XSD of company registration evidence type.

[22] Please note that the user must have the option to stop the data from being used (stop the evidence from being transmitted to the data evaluator') in case the user detects errors in the data. The evidence should be deleted instantly by the data evaluator. Using the evidence to directly pre-fill a form might not fully comply with the SDGR preview requirement. This is to be assessed in the Swedish pilot.

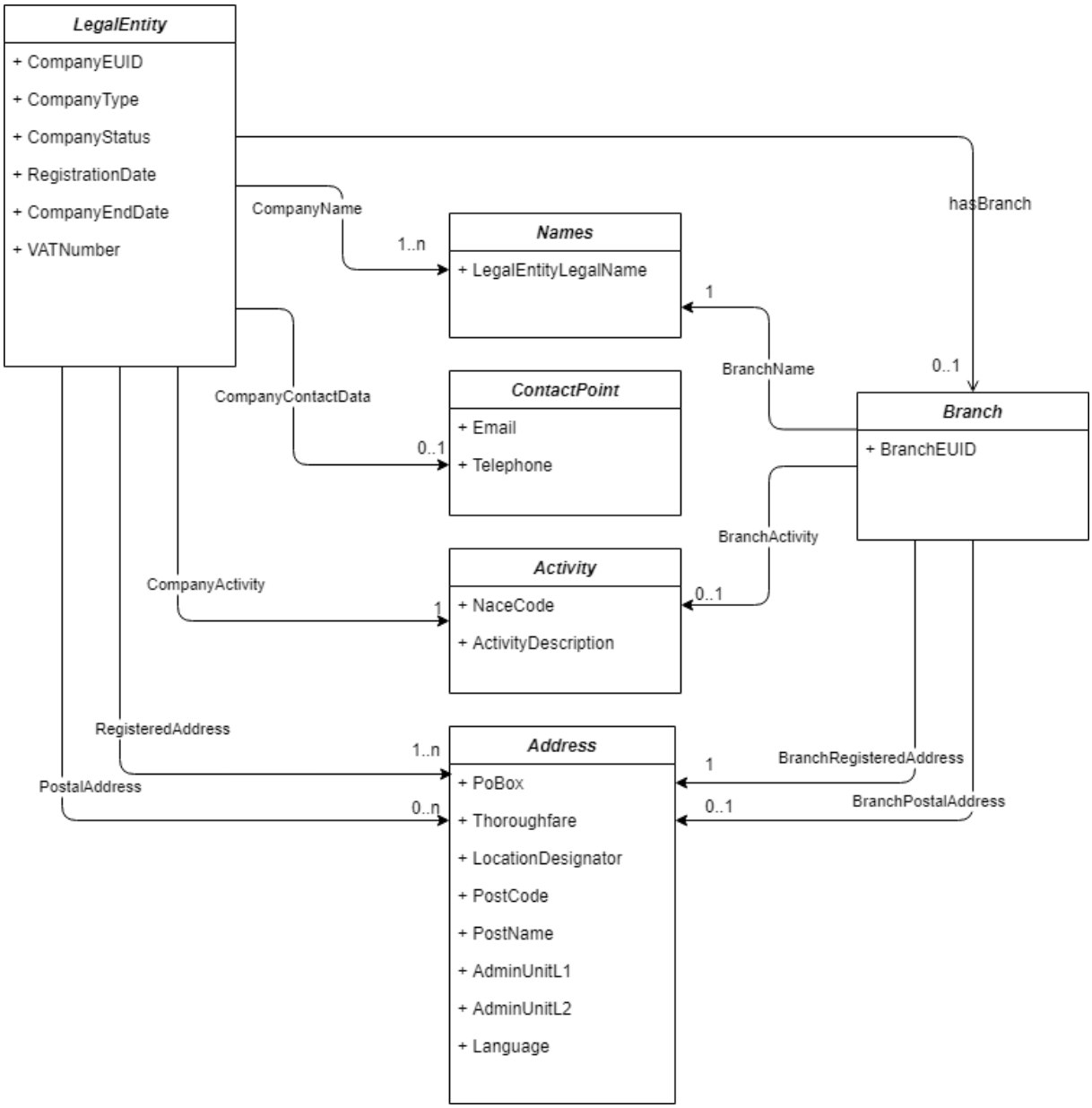


Figure 6: DBA Data model of Company registration evidence type

Table 40: Company registration evidence type

DE4A name	Property type	Cardinality	Data type	Related vocabulary	Controlled vocabulary	Remarks
LegalEntity	Class	1				
Company name	Object	1..n	Names			This is the primary name of the company. Can be provided for multiple languages.
Company type	Datatype	1	String	CBV: legalEntity - companyType	ISO 20275	
Company status	Datatype	1	String	CBV: legalEntity - companyStatus	BRIS	
Company activity	Object	1	Activity			
Company registration date	Datatype	1	Date			
Company end date	Datatype	0..1	Date			
Company EUID	Datatype	1	String	BRIS: companyEUID		This is the identifier as registered in the DP Country formatted as EUID conform BRIS specification: country code + register identifier + registration number + verification digit (optional)
Vat number	Datatype	0..n	String			

Company contact data	Object	0..1	ContactPoint			
Company registration address	Object	1..n	Address			Multiple occurrences allowed for different languages
Company postal address	Object	0..n	Address			
Branch	Object	0..1	Branch			The branch of the parent-company doing business in another MS; will not be used in first pilot iteration
Names	Class					
Legal entity legal name	Datatype	1	cvb:LegalEntityLegalName	CBV: legalEntity - legalname		Only different names if different xml language tags (ISO 639-1) are provided. Example: <LegalEntityLegalName xml:lang="nl">Voorbeeldnaam</LegalEntityLegalName>
Contactpoint	Class					
Email	Datatype	0..n	String	schema.org: contactPoint - email		
Telephone	Datatype	0..n	String	schema.org: contactPoint - telephone		

Activity	Class					
NACE code	Datatype	0..n	String	CBV: legalEntity - companyActivity	NACE	
Activity description	Datatype	0..n	String			Description is only provided if NACE code can't be provided. Only different descriptions if different xml language tags (ISO 639-1) are provided
Branch						This is a branch of the parent-company that is registered in the same MS as the parent-company. If provided in the evidence, this branch is the entity doing business abroad.
Branch name	Object	1	Names			This is the primary name of the branch. Can be provided for multiple languages.
Branch EUID	Object	1	String			
Branch activity	Activity	0..1	Activity			
Branch registered address	Object	1	Address			
Branch postal address	Object	0..1	Address			
Address	Class			CBV: Address		

PO Box	Datatype	0..1	String			Post office box number
Thoroughfare	Datatype	0..1	String			Street
Locator designator	Datatype	0..1	String			House number
Post code	Datatype	0..1	String			Postal code / zip code
Post name (city)	Datatype	0..1	String			City
Admin unit level 2	Datatype	0..1	String			County / region / state
Admin unit level 1	Datatype	0..1	String		ISO 3166-1 alpha 2	Country
Language code	Datatype	0..1	xml:lang		ISO 639-1	Label indicating the language of the specific address.

3.6 Common components

The DBA pilot implements the reference processes of DE4A's PSA to meet the requirement of the DBA pilot. In designing the solutions for the processes, DBA distinguishes between:

1. DBA eIDAS component design
   The architecture for using eIDAS to authenticate the natural person, gather company identification attributes and validate powers.
2. DBA OOP TS component design
   The architecture for using the DE4A OOP TS for exchange of company data between the data evaluator and the data owner.

The eIDAS network is a – from the OOP TS – separate network of eIDAS nodes and their connections. It is linked to the OOP TS via the data evaluator that coordinates the eProcedure. There is no direct interaction between the eIDAS network and the OOP TS. Both the dedicated eIDAS network and the OOP TS consist of common components that need to be deployed, configured and connected. Furthermore the trust infrastructure needs to be in place to allow for secure connections.

3.6.1 Common eIDAS components

3.6.1.1 Roles

The project start architecture [3] has defined several roles for implementing the Once Only Principle: data consumer (split into data evaluator and data requestor) and data provider (split into data owner and data transferor). For the DBA pilot two additional (eIDAS related) common roles have been added: authentication connector and authentication proxy.

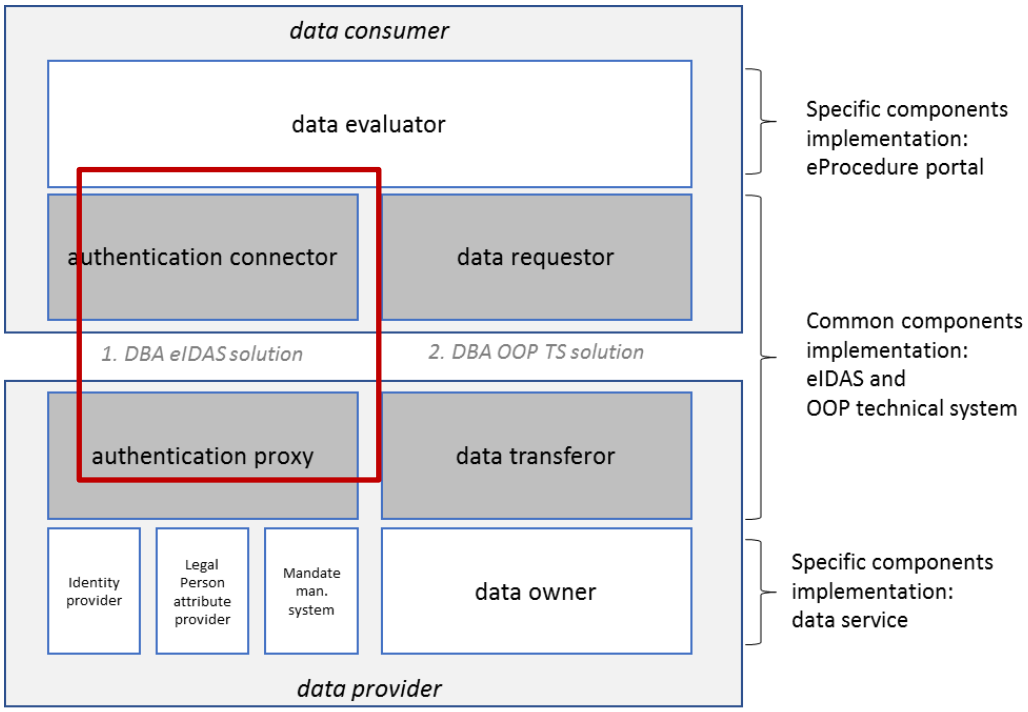


Figure 7: Overview of common eIDAS roles involved

Common eIDAS roles:

- Authentication connector:

The organisation that – typically at a Member State level – connects to the eIDAS network as a relying party. Via the authentication connector, the data evaluator can request authentication, identifying attributes of the company and a powers validation.

- Authentication proxy:

  The organisation that connects the national (notified and non-notified) eID(s), attribute provider(s) and mandate management system(s) to the eIDAS network. The authentication proxy role coordinates the authentication (and powers validation) process. In the two Member State scenario, authentication takes place in the data providing Member State as the user, its eID and the company are all from the DP Member State.

The table below shows which pilot partners perform the common eIDAS roles defined.

Table 41: Common eIDAS roles in Member States

MS	Authentication connector	Authentication proxy
AT	BRZ	BRZ
NL	RVO	RVO
RO	ONRC	ONRC
SE	DIGG	DIGG

3.6.1.2 Solution overview

Compared to current eIDAS practice, the use of eIDAS will be extended by the DBA pilot with:

- Requesting and sending legal person attributes (identifying the company that applies for the service). Although eIDAS has been able to send legal person attributes from the start, this functionality has not been used in production services.
- Validating powers of representation. This function is not part of the eIDAS network currently. In the first pilot iteration (MVP) the pilot partners validate full powers only. Sending natural person attributes and legal person attributes via eIDAS means the natural person may apply for any service in the DC Member state ('DBA access policy rule'). For the second pilot run, fine grained powers validation will be implemented, requiring extension of the eIDAS functionality in order to express the exact powers of representation ('add powers validation attributes'). eIDAS will be extended with the SEMPER attributes for this purpose.

The diagram below presents the common eIDAS components (within the red box), including the surrounding National and local eIDAS components (outside of the red box). The yellow boxes refer to the roles responsible for the components.

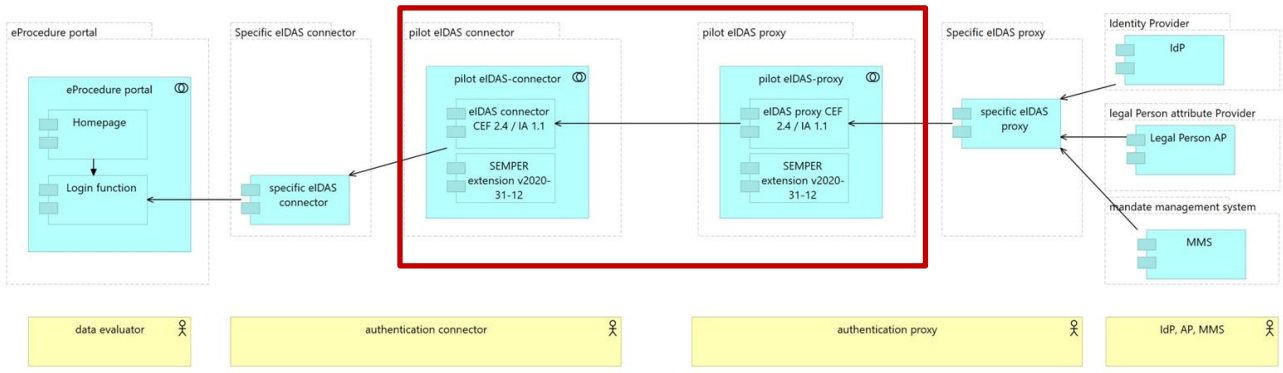


Figure 8: Common eIDAS components

3.6.1.3 Component description

The table below describes the common eIDAS components to use for implementing the pilot processes.

Table 42: eIDAS common components

Component	Role	Short description of its use
eIDAS connector	eIDAS connector	The component Member States implement to connect to the eIDAS network as a relying party. The connector accepts authentication requests from the service providers of the Member State and forwards the requests to the Member States that needs to authenticate the user. After authentication, the eIDAS connector receives the authentication results and sends them to the requesting service provider (relying party). The eIDAS connector can be implemented using CEF's reference software or a custom implementation compliant to the eIDAS interoperability specifications. The CEF reference software implements – besides the eIDAS SAML profile – also the JSON/REST eIDAS Light protocol to connect to national infrastructure.
eIDAS proxy	eIDAS proxy	The component Member States implement to allow authentication with their (notified) eID for services provided in other Member States. The eIDAS proxy receives authentication requests from relying Member States, coordinates authentication, retrieval of legal person attributes and powers validation. The eIDAS proxy then sends the result to the requesting eIDAS connector. Just like the eIDAS connector, the eIDAS proxy can be implemented using CEF's reference software or a custom implementation compliant to the eIDAS interoperability specifications. The CEF reference software implements – besides the eIDAS SAML profile – also the JSON/REST eIDAS Light protocol to connect to national infrastructure.
SEMPER extension	eIDAS connector and eIDAS proxy	To be used in final pilot iteration only: The eIDAS interoperability architecture as well as the CEF reference implementation allow for extension of eIDAS with additional – domain specific – attributes. The SEMPER project used this option to include

		attributes on the powers requested ('powers validation request') and the result of powers validation ('the powers declaration'). The SEMPER extension leaves the eIDAS functionality untouched, but extends its use with an addition to the SAML profile and the Light protocol.

3.6.2 Common OOP TS components

3.6.2.1 Roles

The DE4A OOP TS handles the transfer of evidence from the data owner to the data evaluator.

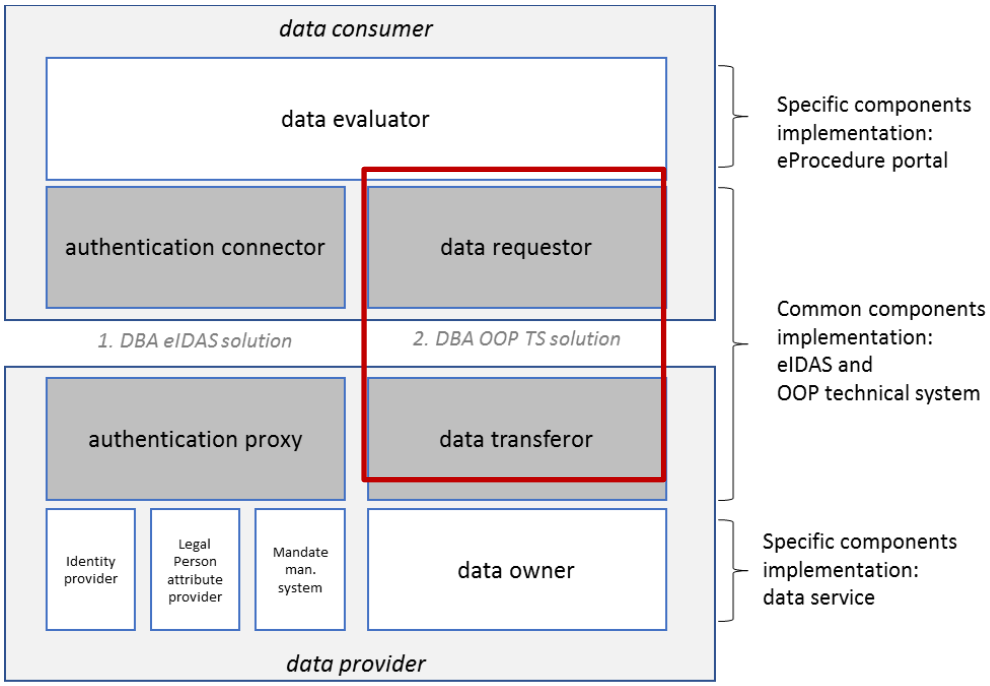


Figure 9: Overview of common OOP TS roles involved

Common OOP TS roles involved in this transfer:

- Data requestor: a data consumer making search and request for data possible in terms of technology.
- Data transferor: a data provider technical responsible for the actual data transmission.

The common OOP TS roles implement the common components, which from a DR and DT perspective mainly consist of the DE4A connector and the SMP. The DE4A connector has an integrated AS4 gateway. The table below shows which pilot partners perform the common OOP TS roles defined.

Table 43: Common OOP TS roles in Member States

MS	Data requestor	Data transferor
AT	BRZ	BRZ
NL	RVO	RVO
RO	ONRC	ONRC
SE	Bolagsverket	Bolagsverket

3.6.2.2 Solution

The OOP TS domain should provide the data requestor and data transferor with the components needed for cross-border evidence exchange. Although this is very complex at a technical level, from a business logic perspective it is not due to MVP-limitations. In the MVP the DBA pilot uses just one type of evidence ('Company Registration evidence type') that all DC's and DP's involved will use. There will be just one data provider per Member state: the business register, which is the authentic source of company information. The DC will request just one Member state for the evidence at a time.

The main characteristics of the OOP TS solution for DBA are:

- Use of eDelivery components for evidence exchange: the evidence exchange will be handled by eDelivery components, like SMP, SML and an AS4 gateway.
- Use of a configuration file to simplify the Information Desk: due to MVP pilot restrictions the DBA pilot does not need advanced information desk functionality. The information required for finding the data owner/evaluator and routing the evidence request/response, will be configured in a file (ESL config file).
- CEF SML and DNS will be used to locate the SMP's of the Member States.
- A DE4A connector will be deployed to interact with all common OPOP TS components to ease Member State deployment. The DE4A connector provides the data evaluator and data owner with an interface to: (1) locate the data owner/evaluator and (2) send the evidence request/response.

The diagram below presents the common DE4A OOP TS components (within the red box), including the surrounding National and local specific components (outside of the red box). The yellow boxes refer to the roles responsible for implementing the components.

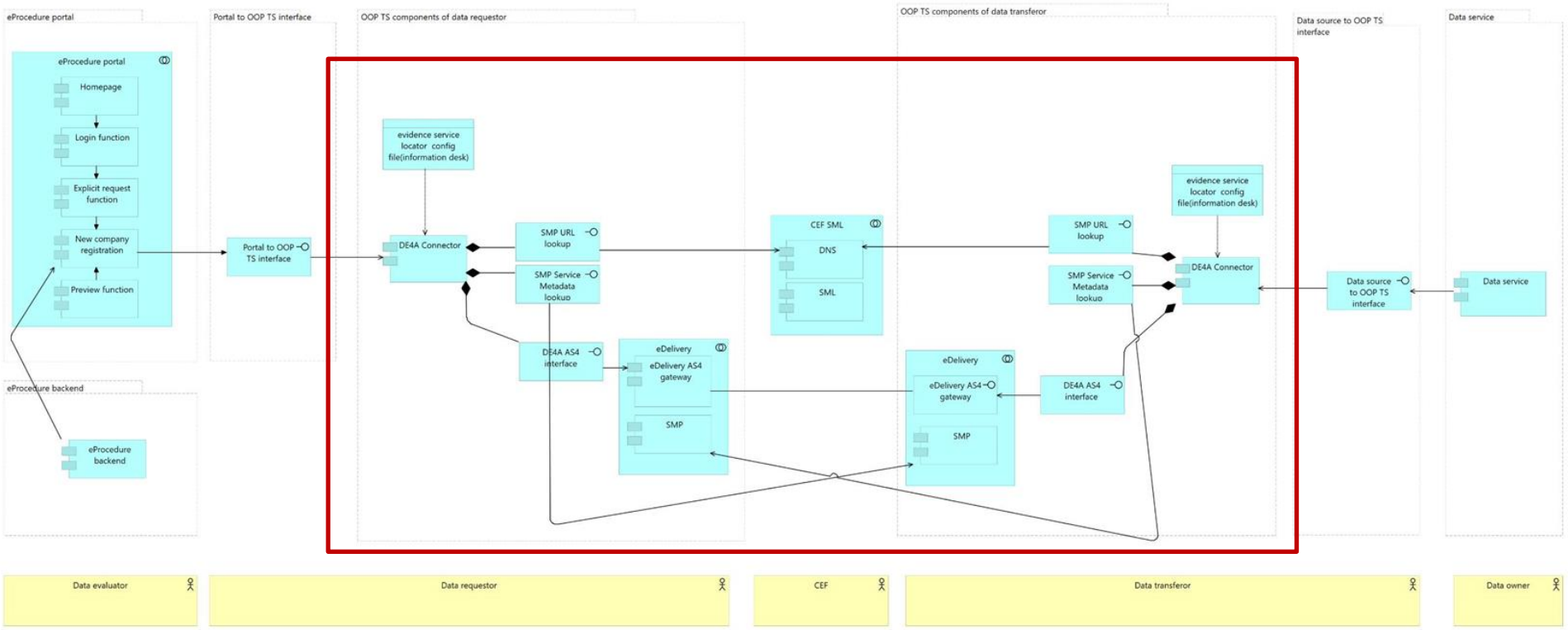


Figure 10: DBA OOP TS component design

3.6.2.3 Component description

The table below describes the common OOP TS components to use for implementing the pilot processes.

Table 44: OOP technical system common components

Component	Role	Short description of its use
Evidence service locator (ESL) configuration file	Data requestor and data transferor	As the DBA pilot's MVP uses just one type of evidence, with just one data provider per Member State (on NUTS0 level), there is no need for dynamic discovery of the data provider and its data services. For the DBA pilot it is sufficient to use a simple configuration file with the required elements (Member State and participant id). The ESL configuration file is also called "Information Desk configuration file". The file will be integrated in the DE4A connector. It will be replaced by full Information Desk functionality in the second pilot iteration.
SMP	Data requestor and data transferor / central	For each evidence request and response, information on the receivers Access Point (URL) and its certificates are needed. Each Member State hosts an SMP for this purpose. Before sending a request or response, the sending party queries the SMP of the receiver to get this information. For initial testing purposes the SMP will be hosted centrally to ease implementation.
DNS & SML	Data requestor and data transferor	As there are multiple SMPs, the sending party needs to know where to find the SMP of the receiver to get the actual metadata. This location can be found in the centrally CEF-hosted DNS, that will be queried by the access point of the sending Member State. DNS entries will be created from the registration of SMPs: the SML, which is also centrally hosted by CEF.
eDelivery AS4 gateway	Data requestor and data transferor	This component – also referred to as eDelivery access point – handles the secure transfer of the data, including encryption and decryption as well as signing/sealing and validating signatures/seals.
DE4A Connector	Data requestor and data transferor	The DE4A connector is the reference software that data requestors and data transferors can use to connect to the OOP TS. This eases the work by abstracting the communication with the components. The DE4A connector handles all communication with the ESL configuration file, DNS & SML and AS4 gateway. The DE4A connector will include an AS4 gateway (Phase4). AT, NL and RO will use this integrated gateway.

3.6.3 Common component deployment

Member States deploy the common components in their national infrastructure. There's several choices Member States have to make in doing so.

Table 45: OOP technical system Member State component choices

MS	AS4 Gateway (Default-Phase4 or Other – indicate product name and version)	SMP product name and version
AT	Default gateway included with DE4A connector	Phoss SMP. Centrally hosted SMP for testing.
NL	Default gateway included with DE4A connector	Phoss SMP. Centrally hosted SMP for testing.
RO	Default gateway included with DE4A connector	Phoss SMP. Centrally hosted SMP for testing.
SE	Holodeck	Phoss SMP. Centrally hosted SMP for testing.

3.7 National and Local specific Components

For piloting the Member States need to adapt or develop Member State specific, data evaluator specific and data owner specific components as well (from now on referred to as "specific components", like the eProcedure portal, the interface between the portal and the DE4A connector (in a DR role), the data service and the interface between the data service and the DE4A connector (in a DT role). This requires effort from the data evaluators and the data owners.

In AT, NL and SE the Identity Providers, Legal Person Attribute Providers and Mandate Management Systems are already operational and implemented in Member States. They need to be connected to the dedicated eIDAS proxy. RO will develop a dedicated Identity Provider for piloting DBA (issuing credentials to legal representatives of Romanian companies).

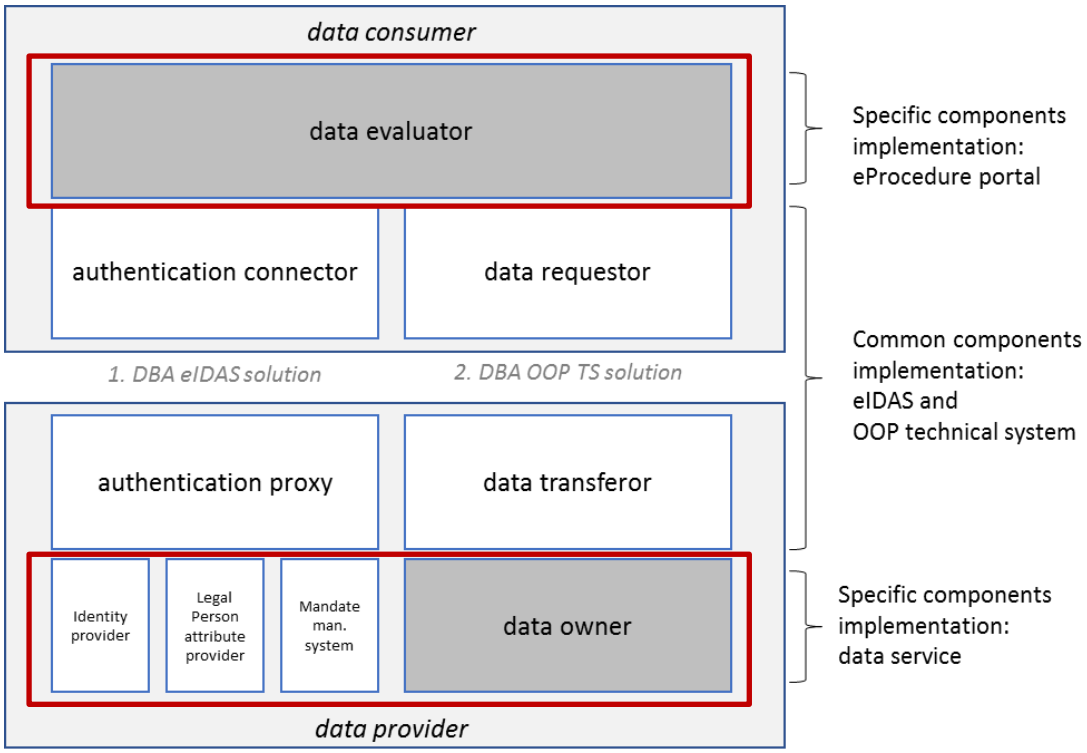


Figure 11: Roles implementing specific components

Roles implementing specific components:

- The data evaluator
  - The actor providing the eService to the company. The data evaluator is the central role in coordinating the complete pilot procedure, interacting with the user and registering a company in the eProcedure portal.
- The data owner
  - The actor owning and maintaining the company data needed for registering a company cross-border. The data owner hosts a data service that constructs the Company Registration Evidence. The data owner always is a business register in the DBA pilot.
- Identity provider
  - The organisation authenticating a person.
- Legal person attribute provider
  - An organisation providing information to identify the Legal person in the authentication process. eIDAS defines two mandatory attributes for the company: the eIDASLegalPersonIdentifier and the eIDASLegalName. Furthermore, several company identifiers may be send as optional eIDAS attributes. The purpose of these attributes is to identify the company, not to provide company registration data (that's what the evidence type "Company Registration evidence" is for). The process of identifying the company in the authentication and powers validation process is implemented differently per Member State. In most of the Member States (AT, NL and SE) the eIDAS attributes have been copied to the mandate management system. In those cases, the business register (as legal person attribute provider) does not need to be connected to the proxy service directly (it has been connected indirectly via the mandate management system already). In case of manual entering the company identifier in the authentication process, the business register (as legal person attribute provider) should be connected to the proxy service to (1) validate the correctness of the identifier entered and (2) provide the other eIDAS attributes. The DBA pilot does not allow for self-declaring company attributes (manually entering the company attributes without validation against the business register directly or indirectly). Please note, that in all DBA-cases the Legal person attribute provider is the business register. To better align with the eIDAS terminology, this source is called an Attribute provider (in the OOP TS domain the business register is called a data owner).
- Mandate management system provider
  - An organisation registering a person's powers to represent another person. A mandate management system may be dedicated to registering mandates only, but may also be part of other systems, like a national Business register (for legal representatives).

Table 46: Partners responsible for specific component implementation

MS	Data evaluator	Data owner
AT	BMDW	BMDW (technical: BRZ)
NL	RVO	KVK
RO	ONRC	ONRC
SE	Bolagsverket, Skatteverket	Bolagsverket

The following table describes the specific components to use for piloting.

Table 47: Description of specific components

Component	Role	Short description of its use
eProcedure portal	Data evaluator	The eProcedure portal (like MijnRVO.nl – see the DC-specific detailed pilot process documents) should connect to the national eIDAS connector. This requires the eProcedure portal to add the eIDAS login option to the login-webpage and the interface to the specific eIDAS connector (see below). As the DBA Pilot will use a dedicated network of eIDAS nodes, the eIDAS login option should be separated from the regular eIDAS login option (in case already available on the eProcedure portal)[23]. The DBA login option should invoke the dedicated eIDAS connector instead of the regular one (a different URL). Of relevance here is the type of eIDAS authentication request to the pilot node that the portal should implement: ▸ authentication at LoA substantial[24] ▸ requesting the natural person attributes (at least the mandatory ones) ▸ requesting the legal person attributes (at least the mandatory ones) After receiving the authentication response, the Member State specific portal should: ▸ deny the user access in case of an “authentication failed”. ▸ grant the user access in case of an “authentication successful”. In case of the latter, the data evaluator grants the user access to all eServices of the portal. The eProcedure portal should also be adapted/built to support the use of the cross-border evidence in the process. For that purpose it should facilitate the user in the OOP-process with an explicit request and option to preview and connect to the OOP TS. Connection to the OOP TS is typically implemented via a Portal-to-OOP TS-interface that may utilize national OOP-protocols and infrastructure.
eProcedure backend	Data evaluator	The eProcedure backend handles all eProcedure specific logic (‘orchestration at technical level’). It also needs to include: ▸ basic logging ▸ management of possible errors, e.g. time-outs

23 To avoid confusions it should be labelled clearly that this option refers to login for this DE4A DBA pilot.

24 For notified eIDs (NL) the LoA has been assessed in the peer review by all Member States taking part in the review. For the non-notified eIDs, the assessment of compliancy to LoA “substantial” will be made by the Member State owning the eID scheme (‘self-declaration’). The other participants will not review the LOA assessments of the other participating Member States.

		▸ record matching on the company (for companies registered prior to the pilot)[25].
Portal to OOP TS interface	Data evaluator	This interface connects the eProcedure portal to the DE4A connector. Most of the Member States (AT, NL and SE) operate a national OOP network with national OOP protocols already. These Member States may (but do not need to) implement an interface from these national OOP protocols to the DE4A connector instead of connecting the eProcedure portal directly to the DE4A connector: eProcedure portal –> national OOP network –> DE4A connector. Such an interface guarantees that the data evaluator can use the same (national) OOP protocols and services for cross-border use as well.
Data service	Data owner	A webservice of the data provider that will output the evidence requested. This will be the canonical evidence (structured data) in the first iteration. In the second iteration it will include the domestic evidence as well.
Data service to OOP TS interface	Data owner	This interface connects the data service to the DE4A connector. Member States may (but do not need to) implement an interface from national OOP protocols to the DE4A connector instead of directly connecting the data source to the DE4A connector. See description for “portal to OOP TS interface”.

3.7.1 AT national applications

Austria will implement the specific components, using the following applications:

Table 48: Specific components AT

Component	National application(s)	Implementation	Description
eProcedure Portal frontend	USP.gv.at	Existing	Business service portal that carries several services (starting a business online) that are not restricted to Austrian companies.
eProcedure Portal backend	Diverse (USP, IDM, Acces Management, UR)	Existing (maybe renewed within the project	

[25] This is required for eProcedure portals that have companies registered already without the eIDASLegalPersonIdentifier (probably BE and AT). SE and RO choose to start with an empty company registry for piloting and therefore don’t need record matching. NL examines the possibility to add the eIDASLegalPersonIdentifier to all foreign companies prior to the pilot start. If successful, NL does not need record matching either.

Portal to OOP TS interface	RSV	Existing	Registry-hub / data-layer which contains data of several registers including the authentic business register.
Data service	UR	Existing	Business Registry
Data service to OOP TS interface	RSV	Existing	Austrian Data Hub
IdP	MoA	Existing	The AT national eID scheme.
Reg d. DP	MMS	Existing	The AT national Mandate Management System.

3.7.2 NL national applications

The Netherlands will implement the specific components, using the following applications:

Table 49: Specific components NL

Component	National application(s)	Implementation	Description
eProcedure Portal frontend	www.rvo.nl / https://mijn.rvo.nl/home	Existing	The national company portal for agriculture, energy and innovation
eProcedure Portal backend	ERB (eBS)	Existing	ERB: ERP-system which also contains the register of relations (natural persons and legal persons).
	Rebus	Existing	Rebus: specific relations database connected to the business register. Functions as ID store and subscription/notification service for the Dutch person and company registries.
	Integratielaag	Existing	Enterprise Service Bus Layer that connects to formal registrations, to take care of exchanging data and orchestration functions.
Portal to OOP TS interface		New	The interface between mijn.rvo.nl and the OOP TS.
Data service	HR Data service + KVK API	Existing	Existing webservice (KVK API) and will be used as-is.
Data service to OOP TS interface		New	The interface between the data owner KVK and the OOP TS. Also handles the transformation of the domestic evidence to the company registration evidence.

3.7.3 RO national applications

Romania will implement the specific components, using the following applications:

Table 50: Specific components RO

Component	National application(s)	Implementation	Description
eProcedure Portal frontend	https://portal.onrc.ro/ONRCPortalWeb/ONRCPortal.portal / de4a-dba.portal.onrc.ro	Existing (copy)	Portal of the National Trade Register Office of Romania (ONRC). For the purpose of this pilot, a dedicated version of ONRC portal will be used.
eProcedure Portal backend	RC	Existing	Integrated Information System that it is used to register and manage all the necessary data about the new and existing companies.
	RC API	New	New API component that will process and store data coming from DE4A-DBA pilot.
	eIDAS connector	New	Interface between de4a-dba.portal.onrc.ro and the RO dedicated pilot eIDAS-node.
Portal to OOP TS interface		New	The interface between the ONRC-Portal and the OOP TS.
Data service	RC	Existing	As described above.
Data service to OOP TS interface		New	The interface between RC and the OOP TS.

3.7.4 SE national applications

Sweden will implement the specific components, using the following applications:

Table 51: Specific components SE

Component	National application(s)	Implementation	Description
eProcedure Portal frontend	eProcedure Portal	New	A new simplified user interface for starting a branch in Sweden.
eProcedure Portal backend	De4a.dba.bve.se	New	The business logic for the portal.
	BVE Company information	Existing	Register to store company information.
	eIDAS Connector	New	Connects eProcedure Portal to SE eIDAS-node.
Portal to OOP TS interface	SSBTGU Integration service	New	Service that acts as a proxy and fetches requested information from several authorities in Sweden.
Data service	BVE Company information	Existing	Business register with requested company information.

Component	National application(s)	Implementation	Description
Data service to OOP TS interface	BVE Evidence extractor	New	A new service will be added to extract the requested evidence and map it to DE4A-format.

4 Pilot implementation activities

To implement the pilot as designed in chapter 3, pilot partners need to develop, customize, adapt, deploy, configure and connect software components. These components can be existing components of front-end and back-end sides of DE and DO as well as new components to integrate with common components of the OOP technical system, i.e. the DE4A Connector and the SMP. Furthermore, they need to test the components deployed and test the integration of components nationally and cross-border. Finally, pilot partners need to involve real users to the pilot - requiring a user involvement strategy as well as carefully selecting and reaching out to users.

This chapter specifies all *activities* needed to do so in a pilot-generic way. Chapter 5 specifies the *milestones* that collectively need to be reached in order to Go-live, including the required activities and the timelines to follow. Chapter 6 elaborates on the *tasks* by which that Member State performs the activities specified in this chapter within the timeliness dictated by chapter 5.

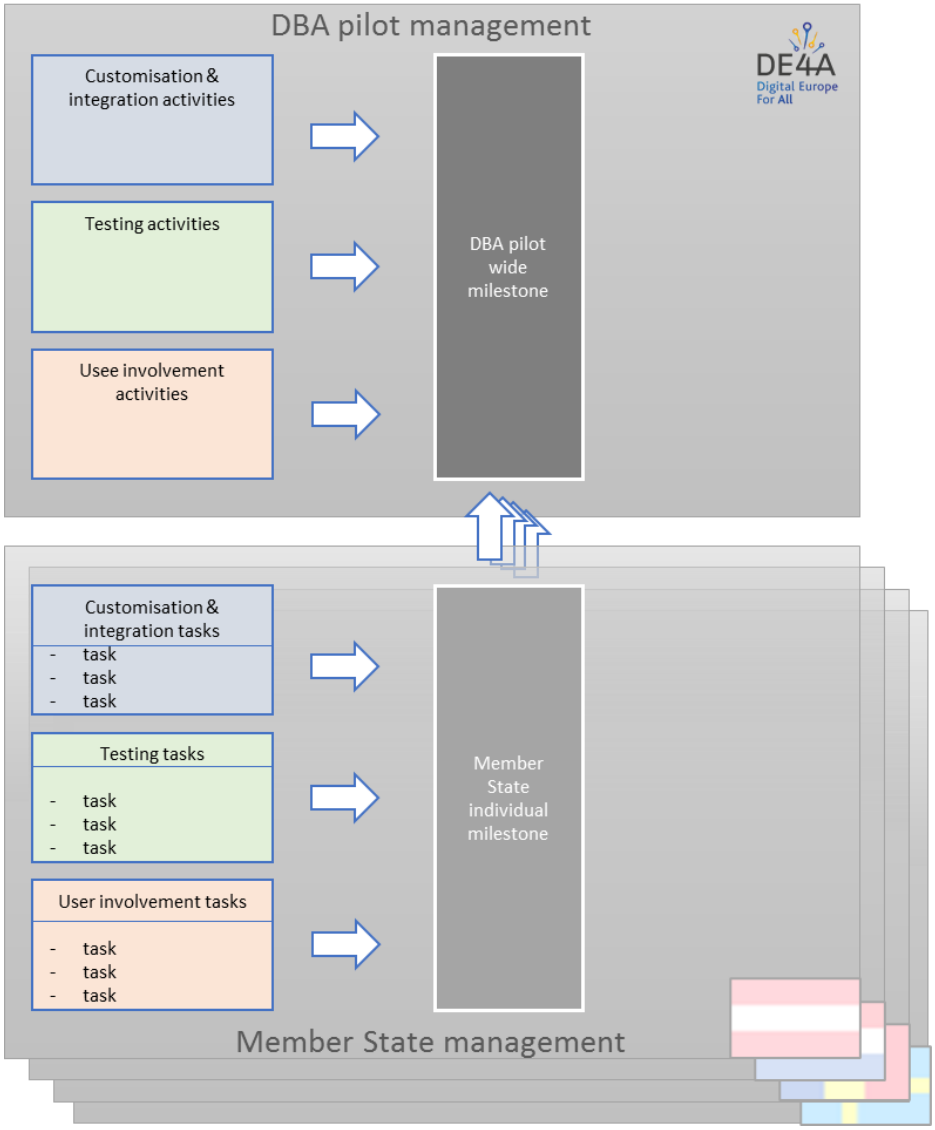


Figure 12: pilot implementation and Member State management

4.1 Common components customization and integration

The common components have been divided into eIDAS components, OOP Technical System components and the trust infrastructure.

4.1.1 eIDAS

The authentication connector role (in the Member State of the data consumer) needs to deploy the dedicated eIDAS node and needs to configure the node to connect to the eIDAS proxies of the other Member States. The authentication proxy role (in the Member State of the data provider) needs to deploy and configure the eIDAS proxy service, connect a national (notified or non-notified) eID, connect a mandate management system for validating full powers and connect a source of company identification attributes (attribute provider, only needed in case these attributes will not be provided by the mandate management system).

Table 52: eIDAS customization and integration activities

Member State	Role	Activity id	Activity	Description
Data consumer	Authentication connector	DBA-AC-1	Deploy and configure dedicated eIDAS connector	Member States set up a dedicated eIDAS network for piloting purposes. From the data consuming Member State this requires setting up a dedicated eIDAS connector.
		DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States	The eIDAS connector that is deployed under task DBA-AC-1 is set up to connect to the proxies of the pilot eIDAS nodes from the other Member States that participate in the DBA pilot. This activity includes confirming with other Member States that eIDAS interoperability works. This requires interoperability testing with test credentials issued by the Member States.
Data provider	Authentication proxy	DBA-AP-1	Deploy and configure dedicated eIDAS proxy	Member States set up a dedicated eIDAS network for piloting purposes. From the data providing Member State this requires setting up an eIDAS proxy capable of sending legal person attributes and validate powers.
		DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States	The eIDAS proxy that is deployed under task DBA-AP-1 is set up to connect to the eIDAS connectors of the pilot eIDAS nodes from the other Member States that participate in the DBA pilot.

				This activity includes confirming with other Member States that eIDAS interoperability works. This requires interoperability testing with test credentials issued by the Member States.
		DBA-AP-3	Integrate national Identity Provider(s) to the national eIDAS proxy	For authenticating natural persons, the Member State should have at least one Identity Provider connected to the eIDAS node. This can be a notified eID (NL) or a non-notified eID (AT, RO and SE). The Identity Provider connected should provide authentication at Level of Assurance substantial and/or high and should provide at least the mandatory eIDAS attributes of the natural person.
		DBA-AP-4	Integrate Legal Person attribute provider to the national eIDAS proxy	The DBA pilot concerns authentication on behalf of companies. That requires authenticating Member States to provide the company identification attributes of eIDAS and validate the powers of the natural person to act on behalf of the company. For sending legal person attributes (of the company represented) the Member State may need to connect a source of legal person attributes to the eIDAS proxy. This may be the mandate management system, but needs to be another source in case the mandate management system is not able to provide the mandatory eIDAS legal person attributes.
		DBA-AP-5	Integrate mandate management system to	For validating powers, the Member State needs to connect a mandate management system to the eIDAS proxy[26].

[26] This is required for online and real-time powers validation. For piloting purposes, Member States may choose not to do real-time powers validation, but to issue piloting credentials to the company's legal representatives only (Romania). The piloting Member State assumes the person is still legal representative (and thus has full powers) when authenticating to the data evaluator. In this way, the mandate management system does not need to be connected to the eIDAS proxy. Powers will only be validated when issuing the eID. Although this is accepted for piloting, it does not meet all principles formulated for real time and online powers validation by the DBA pilot.

			validate full powers.	

4.1.2 OOP Technical system

The data requestor and the data transferor need to implement the common OOP TS components that have been integrated into the DE4A connector. Integrated in the DE4A connector is an AS4 gateway (eDelivery access point) that Member States may use. As an alternative, Member States may connect the DE4A connector to an external AS4 Gateway that the Member State wants to use. See section 3.7 for the choices of the Member States on his topic. For testing purposes Member States may use a centrally hosted SMP. For using production data, Member States must select and deploy a SMP nationally.

Each Member State may decide on which national level to implement these components. E.g. the data requestor may be data evaluator as well, but can also be a separate organisation, depending on national choices. The AS4 gateway (integrated or external) needs to be configured for use with the other pilot Member States. This requires exchange and configuration of certificates and meta-data. Furthermore, as the pilot Member States use the Evidence Service Locator configuration file (also called Information Desk (IDK) configuration file), this file needs to be populated with type of evidence and the DE and DO identifiers (registration details have been specified within the DE4A project).

Table 53: OOP technical system customization and integration activities

Member State	Role	Activity id	Activity	Description
Data consumer	Data requestor	DBA-DR-1	Deploy and configure OOP TS common components: DE4A connector (including the integrated or an external eDelivery AS4 gateway) and SMP, Configure DNS & SML. Populate IDK configuration file.	For requesting and receiving the evidence, data requestors need to implement the DE4A connector as provided by WP5. The DE4A connector includes an integrated AS4 gateway that will be used by AT, NL and RO. SE will connect to a separate AS4 gateway (Holodeck). This activity also deploys the SMP (Member States may choose to use a central SMP for testing) as well as configuration activities.

Member State	Role	Activity id	Activity	Description
		DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.	The AS4 gateways of the data requestors need to be connected to the AS4 gateways of the data transferors (Corner 2 – corner 3 communication in the 4 corner model) added. This requires exchange and configuration of meta-data and certificates for signing and encryption. This task also includes testing whether cross-border connectivity works.
Data provider	Data transferor	DBA-DT-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate IDK configuration file.	See DBA-DR-1. The data transferors need to deploy and configure the same common components as the data requestor to receive evidence requests and send the evidence requested. Member States may implement one single DE4A connector for use as data requestor and data transferor as soon as one organisation acts as data requestor and data transferor.
		DBA-DT-2	Connect to eDelivery AS4 gateways of data requestors.	See DBA-DR-2 This requires exchange and configuration of meta-data and certificates. This task also includes testing whether cross-border connectivity works.

4.1.3 Trust infrastructure (certificates)

Since the ground of each pilot with regards to trust certificates is the same, this section in each pilot planning deliverable will be identical. While this creates this duplication in the content of the deliverables, it also ensures that the documents can be read and understood as stand-alone file.

In order to protect the data whenever the entities in DE4A send or receive information, it is necessary to use mechanisms that guarantee the secure communication. Transport Layer Security (TLS) will be use as the main protocol, which establishes an encrypted session between two endpoints in data transmission and uses digital certificates to help verify the identity of the servers.

Depending on the type of deployment chosen by the MS regarding the eDelivery AS4 gateway, external to the DR/DT or integrated provided within the DE4A connector, it is possible to have the different

options. As it is shown in the following Figure 13, the internal communication between the entities of each DC (DR and DE) or each DP (DT and DO) could be securely protected by TLS or another existing way depending on the MS infrastructure available.

It is worth to mention, AS4 messages are encrypted and signed on the protocol level (using the possibilities of the WS-Security 1.1.1 specification) and by governance the usage of TLS 1.2 or later on the transport layer (with strong cipher suites only) is required, based on the CEF eDelivery AS4 profile. In case of the SMP component, each SMP must have certificate from the same SMP root certificate (CEF PKI for testing) configured as a client certificate for the communication with the SML, as client certificate for the communication with the DE4A connector and as an XML signing certificate for its REST responses.

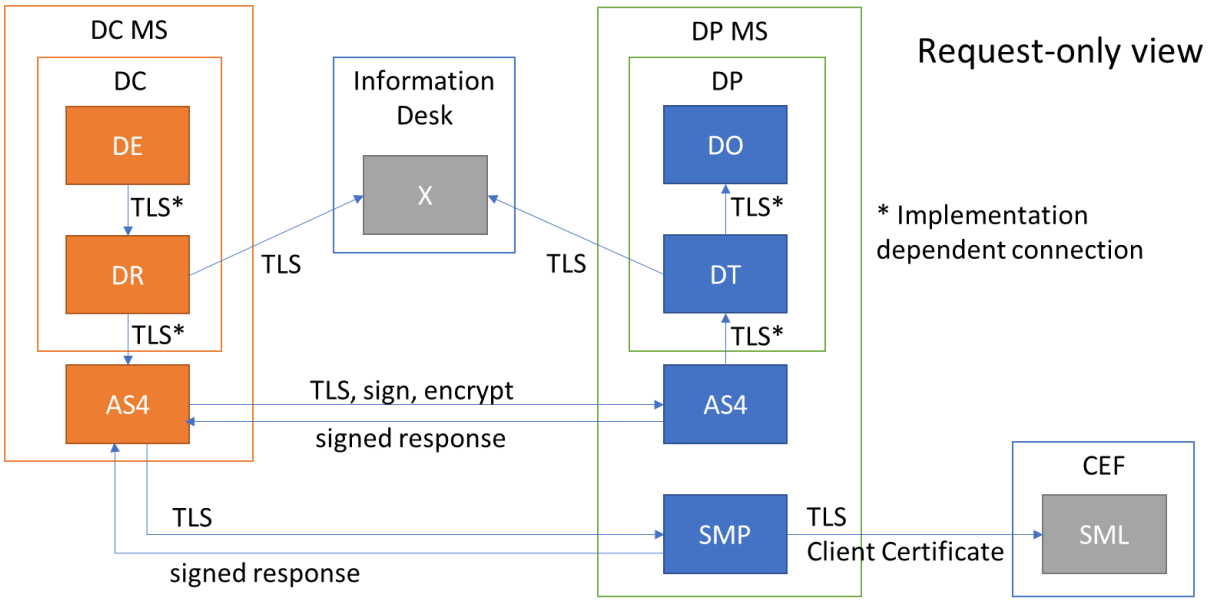


Figure 13: Secured data transmission with AS4 gateway

As a summary of these two figures, the information of the certificates needed can be found in the following table:

Table 54: Trust infrastructure to set up

Purpose/Server	Responsibility	Certificate usage	Certificate source
DC: DE	MS/DC	TLS	Up to MS (guided by DE4A)
DC: DR	MS/DC	TLS	Up to MS (guided by DE4A)
DP: DT	MS/DP	TLS	Up to MS (guided by DE4A)
DP: DO	MS/DP	TLS	Up to MS (guided by DE4A)
eDelivery/AS4	MS/DC, MS/DP	TLS	Up to MS (guided by DE4A)
eDelivery/AS4	DE4A (test & production)	Sign/Encrypt	Test: DE4A PKI Production: Commercial PKI
eDelivery/SMP	MS/DC/DP	TLS	Up to MS (guided by DE4A)
eDelivery/SMP	DE4A (production), CEF (test)	Sign	Test: CEF PKI Production: Commercial PKI
eDelivery/SML	CEF	TLS	Outside of DE4A scope

Based on the different stages of the pilot, two different PKIs will be used: test, prior to the pilot launch, and production, during the pilot running phase. For each of these stages a separate PKI will be used, separated in AS4 and SMP certificates, as shown in Figure 14.

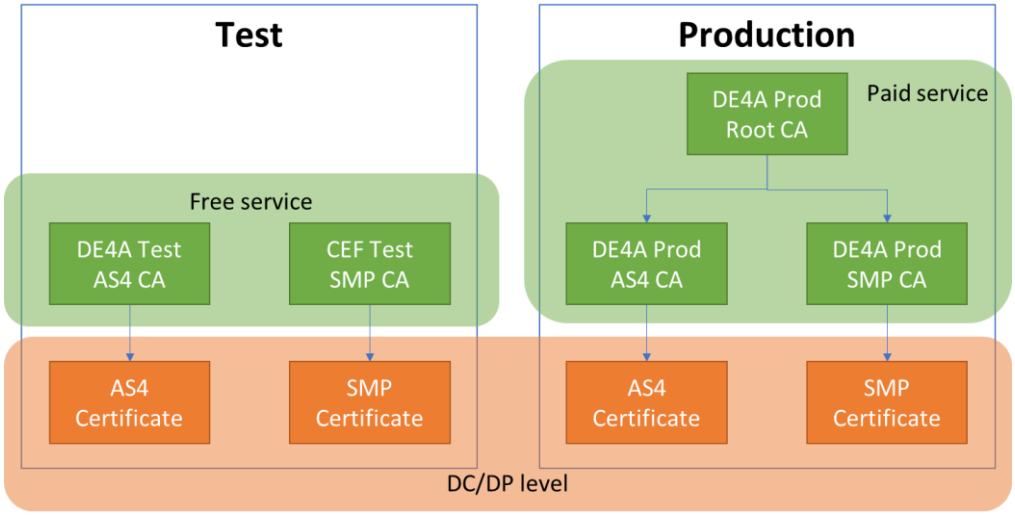


Figure 14: DE4A PKI Layout proposal

The setup for DE4A Test PKI for AS4 exchanges will be provided and maintained by one of participant of the consortium (eGovlab) and new certificates can be retrieved free of charge. In case of the SMP, CEF provided DE4A with ten test certificates based on an internal CEF PKI, with the strict requirement that DE4A will use an external CA.

For the setup of production environment, the PKI will be based on a globally trusted PKI and cannot be self-signed, but it will be discussed during the preparation activities. The production CA for the SMP must be aligned with the requirements of CEF for usage in the SML

Table 55: OOP trust infrastructure configuration activities

Member State	Role	Activity id	Activity	Description
Data consumer and data provider	Data requestor and data transferor	DBA-TR-1	Acquire required (PKI) certificates	The data requestor and transferor need to have all certificates required to integrate to other Member States in a safe way. These are issued by DE4A testing CA and are the ones used between AS4 gateways and with SMP. To connect to DE and DO (when separate entities) additional TLS certificates are required (to be issued by the respective Member State).

The data requestor and transferor need to receive the (public parts of) the certificates of the other Member States to connect. Furthermore, as it was stated, each MS needs to configure the national AS4 gateway.

4.2 Specific component customization and integration

In the authentication domain, data consuming Member States should adapt their eProcedure portals to invoke the dedicated eIDAS connector (instead of the regular eIDAS connectors). In the data providing role, Member States must integrate their national eIDs (notified or non-notified), integrate the mandate management system for full powers validation and connect legal person attribute providers for company identifiers (in case not included in the mandate management system).

Furthermore, the data evaluator needs to adapt the eProcedure portal to implement explicit request & preview, allow their eService for online company registration of foreign companies and to connect to the OOP technical system of the data requestor. The data owner should adapt the data service (in case it does not fulfil the data requirements of the DBA pilot), transform the national data structure to the canonical evidence type and connect to the OOP technical system of their data transferors.

For invoking the DE4A connector of the data requestor / data transferor the eProcedure portal and data service need to implement the interface:

- to retrieve routing information from the information Desk (where to get the evidence?);
- to request evidence and to receive the evidence;
- to handle exceptions and errors.

4.2.1 eProcedure portal

The eProcedure portal is the central component in piloting. The eProcedure portal needs to be extended/set up to allow for registration of foreign companies, request the company registration evidence from the OOP technical system and implement the explicit request and preview.

Table 56: eProcedure portal adaptations

Member State	Role	Activity id	Activity	Description
Data consumer	Data evaluator	DBA-DE-1	Adapt the eProcedure portal for piloting with eIDAS.	The eProcedure portal needs to be adapted to allow piloting with the dedicated eIDAS pilot network. This activity includes: ▸ Optionally set up a pilot portal for simulating eProcedures. ▸ Present the user a notice indicating this is a pilot in a controlled environment and present GDPR-related information. ▸ Add eIDAS login option for users. ▸ Show the user that he/she has successfully authenticated on behalf of the company.
		DBA-DE-2	Connect the eProcedure portal to the dedicated eIDAS connector to send authentication	This activity includes: ▸ Invoke the dedicated eIDAS connector, including a request for legal person attributes.

			requests and receive the authentication results.	▸ Receive authentication result, including the requested legal person attributes ▸ (Receive authentication failed message and allow for re-authentication & re-validation of powers)[27]
		DBA-DE-3	Connect the eProcedure portal to national OOP TS (DE4A connector) to request an evidence and to receive the evidence.	The eProcedure Portal must request the National DE4A Connector for information (evidence) on a company in another country. The request must be formatted and addresses according to the specifications of the DE4A connector and uses the eIDASLegalPersonIdentifier to identify the company (that was received from the eIDAS node after having successfully authenticated and authorized the user). The eProcedure Portal must be able to receive and process the reply of the National DE4A Connector, being either an error message (unsuccessful) or the requested evidence on the company, formatted according the DBA data model. This activity includes: ▸ Retrieve routing information from the Information Desk (this is implemented as a request to the DE4A connector). ▸ Send an evidence request to the DE4A connector. ▸ Receive and validate the evidence from the DE4A connector. ▸ Manage time-outs in case one of the components is down. ▸ Receive/process an error message and inform the user ▸ Allow for re-requesting the evidence in case of an error or in case no evidence has been received.

[27] The pilot eProcedure Portal of the Data Evaluator must be able to process an unsuccessful attempt to authenticate the Natural Person and/or its authorisation to act on behalf of a Legal Person (for which services are to be requested in the eProcedure Portal). The failed attempt will be displayed to the user, accompanied with the option to retry.

		DBA-DE-4	Implement SDG functionality in the eProcedure portal	The eProcedure portal needs to do record matching on the company, implement explicit request and show the preview. This includes: ▸ Check whether the company has been registered at the eProcedure portal before[28]. ▸ If so, suggest the user to apply for a service (like F-tax, tax declaration or eServices defined by the Service directive). ▸ If not, present the user with the explicit request GUI. ▸ Show the user a preview of the evidence (after the evidence response has arrived and in case the response is not an error).[29] ▸ Delete the evidence in case of denial of usage of the evidence. ▸ After approval to use the evidence, transform the canonical evidence into the format required by the data evaluator and start company registration by pre-filling the registration form. ▸ Allow the user to add missing values needed for company registration. ▸ Ask the user to confirm registration. ▸ Register the company. ▸ Suggest the user to apply for a service (like F-tax, tax declaration or eServices defined by the Service directive)[30].

28 Having received the eIDASLegalPersonIdentifier, eIDASLegalName and optionally additional eIDAS attributes of the Legal Person (after completing the authentication and powers validation), the Data Evaluator uses these attributes to check whether or not this one Company (Legal Person) has registered before (registering the eIDASLegalPersonIdentifier in the eProcedure portal database). After successful record matching the Data Evaluator continues the provision of the service using the already registered company information (and adds the eIDASLegalPersonIdentifier to the existing record of the company). In case the data evaluator didn't find a corresponding company record, the eProcedure Portal offers the user the option to use the OOP TS to retrieve data on the company the user represents from business registers in the country of origin.

29 SE is going to integrate the preview in the form to fill in to register the company.

30 In the first iteration RVO will offer the eServices to the user. Skatteverket will add the option to apply for F-tax in the second iteration.

4.2.2 Data services

The data owners in the DBA pilot have to provide the canonical Company registration evidence that the data evaluators need for registering a company cross-border. All data owners are able to provide at least the mandatory data elements of the Company registration evidence type. In all cases they need to transform national data definitions into the harmonized canonical evidence type as defined for the DBA pilot. Furthermore, they need to connect their data service to the OOP technical system.

Table 57: Data service adaptations

Member State	Role	Activity id	Activity	Description
Data provider	Data owner	DBA-DO-1	Adapt the data service for providing the canonical company registration evidence.	This activity includes: ▸ Find the company record[31]. ▸ Retrieve the requested company data. ▸ Transform the company data into the canonical evidence definition. ▸ Construct the evidence.
		DBA-DO-2	Connect the data service to the national OOP TS (DE4A connector) to receive an evidence request and send the evidence.	This activity includes: ▸ Receive and validate evidence request. ▸ Retrieve routing information via the DE4A connector. ▸ Send the evidence. ▸ (send error message).

4.3 Testing

DBA pilot testing will take a staged approach, to ensure that the functionality of individual components and the integration with the other components are also validated and not only the full use case functionality. DBA pilot testing will be organised by:

- Pilot iteration: starting with the first pilot iteration in 2021 and the second in 2022.
- Milestone: each eIDAS / OOP TS milestones defines a coherent set of functions to deliver. For achieving each of the planned milestone (see chapter 5), the components required will be tested (Agile approach).
- Type of testing: there are many pieces to the puzzle that need to fit before the whole can be validated and viewed, therefore, DBA will test individual component first, then test the integration of components on a national level followed by cross-border integrating testing and full use case testing to conclude.

Successfully finalising the testing activities is one of the important go-live criteria for starting the pilot running phase. This does not mean that all the issues have been solved. As a minimum at least all the blocking issues must have been solved prior to going live. Failures discovered by testing will be classified to severity categories, which will be the basis for assignment of the priority for fixing the

[31] The data owner in the evidence request receives the eIDASLegalPersonIdentifier. This identifies includes the company identification in the Business register itself, so no additional record matching is needed.

issue. It will be agreed what is the acceptable threshold in order to accept batch of tests (if the threshold is not passed the testing will need to be repeated once the issues have been fixed). Some test cases can be specific for the pilot use cases (designed by the pilot) while others will be for common functionalities (e.g. connectivity tests).

Table 58: Types of testing

Phase	Type of testing	Actor
Customization & integration	Component testing	1 Member State
	National integration testing	1 Member State
	Cross-border integration testing	2 Member States
	Functional use case testing	2 Member States
Running phase	Validating pilot use case[32]	2 Member States
	Applying for the eServices	Companies

Within the D4.6 DBA Pilot Planning, the following is assumed in regard to the testing activities:

- All common components have been adequately tested by the partner responsible. Meaning that WP3/WP5 has tested the common components of the OOP technical System. Connectivity will be demonstrated on DE4A project level in the playground first. After successful connecting in the playground, DBA pilot Member States will deploy the components and perform national and cross-border integration testing.
- Member States responsible for their specific components take care of adequately testing their components and national integration without interference of the other Member States. Member States do not need to provide formal proof of national testing to the other Member States.
- In national integration testing Member States will use a mock of the DE4A connector to simulate a cross-border request/answer.
- Cross-border testing requires national testing to be completed successfully.

4.3.1 Objectives

The goal of testing the DBA pilot is to ensure the use cases have been implemented as specified in the test cases (see 4.3.7). The functioning of the use cases will be demonstrated by:

1. Logs with the intermediate result of each step and used component, to demonstrate that information is handled and transported adequately by the individual components. Or to demonstrate the errors are invoked as designed (negative testing is important as well).
2. Screen shots showing successful company registration and visual proof of the information provided to the user in case of non-happy flows.
3. Recorded witness sessions, making a screen recording of a successful execution of the use case.

The testing results will be reported in the DBA testing report (internal deliverable), distinguishing between the Member State combinations that will be tested, e.g. a user from The Netherlands can use an eProcedure in Austria, Romania and Sweden and a user from Romania can access an eProcedure in the Austria, the Netherlands and Sweden, etc.

[32] The goal of this type of testing is to ensure the pilot use case is up and running before inviting representatives of companies to apply for the eProcedures.

The DBA solution consists of two relatively independent flows: eIDAS for authentication and powers validation and OOP for exchange of company data evidence. Both converge at the data evaluator that coordinates the eProcedure. Implementation of the eIDAS and the OOP components both follow their own timelines, as will be described in Customization and integration pilot management plan. Therefore, testing of both solutions will be organized separately to prevent unnecessary dependencies.

- eIDAS testing: these test activities focus on testing the eIDAS authentication flow, starting from the eProcedure portal with an authentication request and ending back at the eProcedure portal with a successful authentication and Powers validation from the data providing Member State.
- OOP testing: these test activities focus on testing the data retrieval via the OOP technical system. The test flow starts with the eProcedure portal requesting a company data evidence and ends with the portal registering the company in the eProcedure portal database (and depending on the scenario: assessing tax duties, filing tax or applying for any other SDGR service or Service Directive service).

Functional use case testing and cross-border production testing will test both eIDAS and OOP TS combined. See the next section.

Testing will use fictitious company data and fictitious companies. Pilot running will be using real company data and real companies.

4.3.2 Types of testing

This section elaborates on component testing, national integration testing, cross-border integration testing and functional use-case testing.

Component testing

Component testing is validating correct operation of an individual component. This test focusses on the processing within a component, validating the outputs of the component, given the inputs provided. Component testing in principle involves only the entity (organisation/work package) responsible for providing the component.

Components involved:

1. The individual component to test, e.g. the eProcedure portal.

National integration testing

Integration testing is validating the correct interaction between two or more components. This type of testing does not focus on the inner workings of a component, but on the cooperation of components in as defined in Pilot design. This requires involvement of two or more components that have been linked together. Integration testing starts with a 'smoke test' to check whether the connectivity of the components has been configured properly. It ends with testing all functions that the components together should provide.

National integration testing checks whether the components integrate adequately on a national level, e.g. whether the eProcedure portal can successfully request an evidence and process the result. This is a national responsibility. For this purpose, the Member State uses WP5-stubs to simulate cross-border interaction.

Components involved:

1. DC Member State national integration testing components:
   a. eIDAS flow:
      - simulated eProcedure portal
      - eProcedure portal to eIDAS interface

- eIDAS connector
- stub of foreign eIDAS proxy

b. OOP TS flow:
- simulated eProcedure portal
- eProcedure portal to OOP TS interface
- DE4A connector
- stub of foreign DP DE4A connector

2. DP Member State national integration testing components:

a. eIDAS flow:
- Simulated IdP/AP/MMS
- eIDAS proxy
- stub of cross-border eIDAS connector

b. OOP TS flow:
- data service
- data service to OOP TS interface
- DE4A connector
- stub of foreign DC DE4A connector

Cross-border integration testing

Cross-border integration testing focusses on communication between two or more Member States. Ideally, national and cross-border integration testing will be executed sequentially: national testing first and then cross-border testing. In practise, this will not be feasibly and not strictly necessary. There will be overlap in testing both types. Therefore, it is crucial to quickly assess the origin of issues encountered in testing. Issues in national integration should be solved by Member States individually. Cross-border issues require cooperation of at least two Member States. For this purpose, the DBA pilot will set up an arrangement for proper issue tracking in JIRA. Issues will be categorised in “national” and “cross-border”.

Testing eIDs that correspond to fictitious companies are being exchanged between Member States to enable cross-border integration testing of the eIDAS network and the OOP technical System. The eIDs should be configured to represent companies of which data can be retrieved from the data owner.

Components involved:

1. eIDAS flow cross-border integration testing components:
- simulated eProcedure portal (DC)
- eIDAS connector (DC)
- eIDAS proxy (DP)
- simulated IdP/AP/MMS (DP)

2. OOP TS flow cross-border integration testing components:
- simulated eProcedure portal (DC)
- eProcedure portal to OOP TS interface (DC)
- DE4A connector (DC)
- DE4A connector (DP)
- data service to OOP TS interface (DP)
- data service with real or fictitious data (DP)

Functional use case testing

After successful cross-border integration testing, Member States will test the use case functionally. In a functional use case test, two Member States (one DC and one DP) will test the use case scenarios from the perspective of the company applying for the service. This type of testing addresses the happy as well as the non-happy flows. By successfully functional testing, the two Member States have ensured they can go-live.

Components involved:

1. DC components:
    - *simulated* eProcedure portal
    - eIDAS connector
    - eProcedure portal to OOP TS interface
    - DE4A connector
2. DP components
    - data service with real or fictitious data
    - data service to OOP TS interface
    - DE4A connector
    - eIDAS proxy
    - *simulated* IdP/AP/MMS (DP)

Cross-border production testing

Please note that after Go-live, the production deployment needs to be validated to check whether all connections are up and running and deployment is successful. This is the last testing activity before running the pilot. As this is “production” a real company needs to be involved with a real eID.

Components involved:

1. DC components:
    - *real* eProcedure portal
    - eIDAS connector
    - eProcedure portal to OOP TS interface
    - DE4A connector
2. DP components
    - data service with real data
    - data service to OOP TS interface
    - DE4A connector
    - eIDAS proxy
    - real IdP/AP/MMS (DP)

Section 4.3.7 specifies the test cases for testing DBA.

4.3.3 Testing responsibilities

The responsibilities for component testing are as follows:

Table 59: Component testing responsibilities

Domain	Component	Role responsible for testing
eIDAS	eProcedure portal (eIDAS functions)	Data evaluator
	eIDAS connector	Authentication connector: deployment and configuration
	eIDAS proxy	Authentication proxy: deployment & configuration
OOP TS	eProcedure portal (OOP functions)	Data evaluator
	Data service	Data owner
	OOP TS common components	WP5: software components Data requestor and data transferor: deployment & configuration (support by WP5)

The responsibilities for national integration testing are as follows:

Table 60: National integration testing responsibilities

Domain	Aspect of Integration	Role responsible for testing
eIDAS	eProcedure portal to eIDAS integration	Data evaluator
	IdP to eIDAS integration	Authentication proxy
	MMS / AP to eIDAS integration	Authentication proxy
OOP TS	eProcedure portal to OOP TS integration	Data evaluator (support by WP5)
	Data service to OOP TS integration	Data owner (support by WP5)

The responsibilities for cross-border integration testing are as follows:

Table 61: Cross-border integration testing responsibilities

Domain	Role responsible for testing
eIDAS	National test coordinators with support of DBA pilot lead.
OOP TS	National test coordinators (support of WP5).

National integration testing requires national coordination by the partner leading the DE4A DBA participation in that Member State. The national coordinator is responsible for aligning with the other Member States in cross-border testing as well. The national test coordinator is responsible for the functional use case testing as well.

Table 62: National test responsible persons

Member State	National test coordinator
AT	BRZ
NL	RVO – Dennis Reumer
RO	ONRC
SE	Bolagsverket

4.3.4 Use of mocks and stubs

For testing purposes the DBA pilot expects testing facilities to be provided by WP3/WP5:

- Mock of the DE4A connector to test DE and DO connections to the OOP TS. The mock should simulate the common OOP TS components, to be able to process/send evidence requests and issue/process evidence responses.
- Mock of the DE and DO to allow the Member State to validate its deployment and configuration of the DE4A connector.
- Hosted DE and DO to validate national setup including real connections.
- JAVA Client libraries for (un)marshalling the XML messages.

Furthermore, DBA expects WP5 to:

- support for deployment of the OOP TS common components, especially with regards to installation and configuration of meta-data and certificates;
- organise Connectathons to validate OOP TS connectivity between the pilot Member States;
- operate and support the playground as testing environment including centrally hosted SMP and eDelivery gateway.

4.3.5 Bug tracking

Bugs will be discovered throughout the testing phase. The project will maintain two environments for tracking bugs:

1. The DE and DO existing tracking tool. This will be used for recording all bugs that are found within the service that are not related to DE4A common components.
2. The JIRA environment. This will be used for tracking all bugs that are discovered and that relate to the DE4A common environment. Recording of these bugs will require the Pilot number and the severity recorded against them.

The following table lists the severity definitions used to classify defects.

Table 63: Defect severity definitions

Severity	Description of Severity
P1	**Critical** – the system is broken and cannot be used, major functionality is impaired, or there is data loss. There are no workarounds
P2	**Major** – the fault renders several system elements unusable or affects one or more system elements. Workarounds exist which may be unacceptable to the customer.
P3	**Minor** – the fault affects system elements that are not key to the overall functionality of the system or operation of the Departments day-to-day business. The system

Severity	Description of Severity
	continues to produce correct results and data is not affected. Acceptable workarounds for the end customer may exist.
P4	**Trivial** – this fault barely affects the quality of a system and will only be fixed if time permits.

JIRA issues will be discussed in regular bug tracking meetings to be organized by the DBA test coordinator.

4.3.6 Testing activities

This section defines by which testing activities DBA testing will be done and what meetings ('events') will be organised at pilot level. Components testing and national integration testing have been left out, as these are considered to be specific for the Member State and do not require cross-border involvement.

Table 64: Testing activities

Activity id	Activity name	Description
DBA-TE-1	Cross-border integration testing of eIDAS nodes, including IdP	This testing activity focusses on validating eIDAS node connectivity between the DBA Member States. It will use mocks of the eProcedure portal ('DE mocks') to initiate authentication and use the connected Identity Providers for natural person authentication.
DBA-TE-2	Cross-border integration testing of eIDAS nodes, including eProcedure portal, IdP and AP.	This testing activity focusses on the exchange of legal person attributes from the DP Member State to the eProcedure portal. Therefore, in addition to DBA-TE-1 it adds the eProcedure portal and a source for legal person identification attributes (at least the eIDASLegalPersonIdentifier and the eIDASLegalName). Powers validation is not tested in this activity yet.
DBA-TE-3	Cross-border integration testing of eIDAS nodes, including eProcedure portal, IdP, AP and MMS.	In this testing activity, the full eIDAS flow for representing a company will be tested Cross-border. In addition to DBA-TE-2 also the validation of full powers by the Mandate Management System will be tested.
DBA-TE-4	Cross-border integration testing OOP TS components	In this testing activity NL and RO will validate the connectivity of the OOP TS components deployed. They will use the DE and DO mocks for testing.
DBA-TE-5	Cross-border integration testing OOP TS components, including eProcedure portal and data service.	In this testing activity the connectivity tests are extended to AT and SE. Furthermore, the eProcedure portals and data services are included in integration testing.

Activity id	Activity name	Description
DBA-TE-6	Functional use case testing	This testing activity checks whether all functionality required by the DBA pilot works as specified.
DBA-TE-7	Cross-border production testing	This activity checks whether the functionality has been deployed, connected and configured as intended in the pilot running environments of the pilot partners. This is a requirement to go-live.

Some of the events below will be organised on a per-milestone basis.

Table 65: Testing events

Events id	Event	Description	Frequency
1	Kick-off testing meeting	Initial Testing meeting to introduce all the testing coordinators from the Pilot Member States and plan the subsequent meetings.	Once
2	Cross border bug/findings tracking meetings	Regular "stand-up" meeting, involving testing coordinators of the Pilots and WP5 representative, to discuss the status of issues found and the steps to resolve (WP5 representative is not required for the eIDAS milestones)	weekly
3	National bug/findings tracking meetings	Regular meetings within the Pilot Member State to track issues found and their resolution. WP5 representative only when required.	Weekly (national meetings)
4	Bi-weekly Readiness meetings (Country reporting on national integration testing)	Test coordinators come together to report on their progress of the national implementation and testing results of component and national integration testing. Goal is to be able to be aligned and be able to plan the connectathon meetings.	Bi-weekly

Events id	Event	Description	Frequency
5	Cross-border connectathons with Pilot Participants (eIDAS)	Scheduled meetings to validate connectivity for eIDAS and hands-on resolve potential issues in configuration(s). Test Coordinators and actual eIDAS Node Operators that can correct configuration issues during the connectathons. Goals is to ensure all eIDAS Node connections between the various Member States work properly. Evidence of the proper functioning of the eIDAS system is also gathered during these meetings.	Once or twice per milestone
6	Cross-border Connectathons with Pilot Participants (OOP TS)	Scheduled meetings to validate connectivity for OOP TS and hands-on resolve potential issues in configuration(s). Test Coordinators and actual OOP TS Operator resources that can correct configuration issues during the Connectathons. Goals is to ensure all OOP TS connections between the various member-states work properly. Evidence of the proper functionality of the workings of the OOP TS system is also gathered during these meetings.	Once or twice per milestone
7	Joined functional Use Case Testing workshops (Running all scenarios, together with all participating Pilot members)	After successful completion of the cross-border integration tests, these meetings are used to execute all the Use Case scenarios with the whole active eIDAS/ OOP TS system. Test Coordinators form at least two pilot Member States, perform this together. During the meeting the evidence of correct functioning of the use case is captured and secured. The goal is to deliver all the evidence as input for the Test Report	At least once per DC-DP combination.

Events id	Event	Description	Frequency
8	Testing Results review meetings	Review the Test Report and results and if possible, retest if in the first meeting some scenarios had finding/bugs.	At least once per DC-DP combination.
9	Construct Test Report	Write and provide the final version of the Test Report	Once

4.3.7 Test cases

This section provides a draft of the test cases that need to be performed for each of the milestones, including the components involved, the use of mocks, the types of testing involved and any pre-conditions that may apply.

Table 66: Test cases eIDAS milestone 1

eIDAS milestone 1: eIDAS for natural persons up and running	
Components involved	▸ eIDAS connector ▸ eIDAS proxy ▸ IdP
Mocks to use	▸ DE mock for requesting a natural person authentication and receiving the results. ▸ Please note: this DE-mock will not be provided by WP5. It needs to be developed by the Member State itself if not already available.
Type(s) of testing	Cross- border integration testing
Pre-conditions	Component testing without blocking issues (eIDAS connector, eIDAS proxy, IdP). - National integration testing without blocking issues: DE mock integration to eIDAS connector and IdP integration to eIDAS proxy.
Test cases	▸ Authentication successful ▸ Authentication failed ▸ Authentication cancelled by user

Table 67: Test cases eIDAS milestone 2

eIDAS milestone 2: eIDAS for legal persons up and running	
Components involved	▸ e-Procedure portal front-end ▸ e-Procedure portal back-end ▸ eIDAS connector ▸ eIDAS proxy ▸ IdP ▸ Legal person Attribute Provider (possibly by the MMS).

Mocks to use	MS specific DE mock might be used as first step in validating cross-border flow.
Type(s) of testing	Cross- border integration testing
Pre-conditions	▸ eIDAS milestone 1 finished without blocking issues ▸ additionally component testing on eProcedure portal front-end and back-end as well as AP finished without blocking issues ▸ national integration testing on eProcedure portal to eIDAS connector without blocking issues ▸ national integration testing of AP to eIDAS proxy without blocking issues
Test cases	▸ authentication including legal person attributes successful. ▸ authentication including legal person attributes failed. ▸ authentication cancelled by the user.

Table 68: Test cases eIDAS milestone 3

eIDAS milestone 3: powers validation implemented	
Components involved	▸ e-Procedure portal front-end ▸ e-Procedure portal back-end ▸ eIDAS connector ▸ eIDAS proxy ▸ IdP ▸ Legal person Attribute Provider (possibly by the MMS). ▸ MMS
Mocks to use	MS specific DE mock might be used as first step in validating cross-border flow.
Type(s) of testing	Cross- border integration testing
Pre-conditions	▸ eIDAS milestone 2 tested without blocking issues ▸ additionally national component testing on MMS completed and national integration testing of MMS to eIDAS proxy without blocking issues.
Test cases	▸ successful authentication on behalf of a company (natural person has full powers). ▸ unsuccessful authentication on behalf of a company (natural person has insufficient powers). ▸ authentication failed. ▸ authentication cancelled by the user.

Table 69: Test cases OOP TS milestone 1

OOP TS milestone 1: “Hello Europe” in lab	
Components involved	OOP TS components: ▸ DE4A connector ▸ Optional external eDelivery AS4 gateway

	▸ SMP ▸ DNS & SML ▸ ESL configuration file
Mocks to use	▸ DE-mock ▸ DO-mock
Type(s) of testing	Component and integration testing by WP5.
Pre-conditions	This milestone is WP3/WP5 internal. No direct DBA involvement.
Test cases	This milestone is WP3/WP5 internal. No direct DBA involvement.

Table 70: Test cases OOP TS milestone 2

OOP TS milestone 2: "Hello Europe" between two connected Member States	
Components involved	OOP TS components: ▸ DE4A connector ▸ Optional external eDelivery AS4 gateway ▸ SMP ▸ DNS & SML ▸ ESL configuration file
Mocks to use	▸ DE4A connector mock (as step-up for deployment of the real DE4A connector) ▸ DE-mock ▸ DO-mock
Type(s) of testing	Cross-border integration testing (2 Member States)
Pre-conditions	▸ No blocking issues in OOP TS milestone 1 testing. ▸ Component testing on the OOP TS common components has been successful in both Member States. ▸ National integration testing on the deployment of the common components has been successful (DE mock – DE4A connector, DO-mock – DE4A connector) in both Member States.
Test cases	▸ Success: Send an evidence request for a specific eIDASLegalPersonIdentifier from the DE-mock to the data transferor. Receive the evidence from the DO-mock in return. ▸ LegalPersonID Not Found: Send an evidence request for a specific eIDASLegalPersonIdentifier from the DE-mock to the data transferor. Receive in return the message that the eIDASLegalPersonIdentifier could not be found by the DO. ▸ DP not available: Send an evidence request for a specific eIDASLegalPersonIdentifier from the DE-mock to the data transferor. Receive in return the message that the DP (DT or DO) is not available for response.

Table 71: Test cases OOP TS milestone 3

OOP TS milestone 3: full scale cross-border communication for all Member States	
Components involved	Specific components: ▸ eProcedure portal front-end and back-end ▸ Portal-to-OOP-interface ▸ Data service ▸ Data service to OOP TS interface OOP TS components: ▸ DE4A connector

OOP TS milestone 3: full scale cross-border communication for all Member States	
	▸ Optional external eDelivery AS4 gateway ▸ SMP ▸ DNS & SML ▸ ESL configuration file
Mocks to use	▸ DE mock (to test connection of real DO) ▸ DO mock (to test connection of real DE) - The final tests for this milestone should be performed without mocks.
Type(s) of testing	Cross-border integration testing (all Member States)
Pre-conditions	▸ OOP TS Milestone 2 testing without finished without blocking issues (cross-border testing with 2 Member States successful): common OOP TS components mature enough for use by all Member States ▸ National integration testing on the deployment of the common components has been successful (DE mock – DE4A connector, DO-mock – DE4A connector) in all Member States ▸ Component testing of eProcedure portal and data service without blocking issues. ▸ National integration testing of eProcedure portal and data service without blocking issues integration testing of: ▸ eProcedure portal front-end, eProcedure portal back-end, portal-to-OOP-interface and DE4A connector ▸ data service, data service-to-OOP TS interface and DE4A connector
Test cases	Sending evidence request from eProcedure portal and receiving evidence in return.

Table 72: Test cases OOP TS milestone 4

OOP TS milestone 4: ready to start pilot	
Components involved	Specific components: ▸ eProcedure portal front-end and back-end ▸ Portal-to-OOP-interface ▸ Data service ▸ Data service to OOP TS interface OOP TS components: ▸ DE4A connector ▸ Optional external eDelivery AS4 gateway ▸ SMP ▸ DNS & SML ▸ ESL configuration file eIDAS components:

OOP TS milestone 4: ready to start pilot	
	▸ Authentication connector ▸ Authentication Proxy ▸ IdP ▸ MMS / AP
Mocks to use	none
Type(s) of testing	Functional use case testing
Pre-conditions	▸ OOP TS milestone 3 successfully achieved (the Member States testing need to be fully connected to the OOP TS, eProcedure portal and data service need to be ready). ▸ eIDAS milestone 3 successfully achieved (eIDAS ready for piloting and eProcedure portal fully connected to eIDAS, full powers validation implemented).
Test cases	Specific for each eProcedure portal. To be defined by the data evaluators.

4.4 User involvement activities

To run the pilots, real representatives, companies and employees from the Data Evaluator and Data Owner will be involved in the pilot scenarios of most participating Member States. It is important that these people and companies are informed about the DE4A pilot and all its conditions and constraints, but at least part of the participants should have not been involved during the pilot preparation activities. This way, independent and unbiased feedback and observations can be collected and the learning value of the pilot will be maximised.

Although many topics that are addressed in this paragraph will be applicable to both the first and the second pilot iteration, the focus will be on the first pilot iteration. After running the first pilot iteration, the lessons learned will be used to refine the user involvement for the second pilot iteration. This also goes for any changes in the pilot conditions resulting from additional infrastructural elements (like extra interaction patterns).

4.4.1 User involvement strategy

The available infrastructure and facilities in participating Member States dictate the possibility (and need) for categories of users to be involved. In short, three categories of users are distinguished:

1) Employees from the Data Evaluator
   a) Working in the process where service requests are being processed
   b) Working in the process of service delivery
   c) Working to maintain the eProcedure portal and connected applications
2) Employees from the Data Owner
   a) Working in the process where data requests are being processed
   b) Working to maintain the business register system and connected applications
3) Representatives and companies
   a) Fictitious

      Fake companies represented by fake representatives (to be populated with project team members or professional representatives)

b) Invited familiar companies (from the professional network of the DBA partners)

Well-known real companies represented by real representatives, being able to act like they want to do business in another Member State but do not have a real business objective to do so. They can pilot for registration purposes only.

c) Invited companies

Any company really interested in doing business in another Member State.

All categories of users need to be involved in order to determine the level of goal achievement (see Pilot benefits logic and metrics).

Employees working with the Data Evaluator or the Data Owner will be invited to participate in the pilot. During the preparations for the pilot, the DE4A DBA team collaborates with the DE and DO public authorities in their countries, providing easy access to employees of these public authorities.

For companies and representatives, the involvement strategy is different. The subcategory of company to be involved is strongly dependent on the infrastructural situation in the Member States. This dependency is addressed in more detail, in the next paragraph.

For all company subcategories, the objective is to involve natural persons (professionals) that own (or represent) companies in real life, so they can judge the DE4A solution from a true and realistic perspective (even if the pilot should concern fictitious companies).

For fictitious and invited familiar companies and representatives (aiming to pilot for registration purposes), the DE4A DBA partners invite company owners from their professional network (professional colleagues and companies they are doing business with).

To involve real companies that are really aiming to do business in another Member State, the DE in the participating Member States is requested to invite companies (from other participating Member States) that contact them during the months prior to running the pilot, on starting a business in their country. Also during this period, the DO and Chambers of Commerce will be consulted on local companies that consulted them on starting business in one of the participating countries. DE and DO will provide the URL with more data on the pilot, to the company. This, of course, is only applicable in situations where a real production environment is used in both the DC and the DP Member States (see next paragraph).

The involvement of real companies aiming to do real business in the participating Member States must be considered a best-effort approach, as the availability of – for example – Romanian companies actually aiming to start business in Sweden, within the timeframe of the pilot iteration, is unpredictable. Alternatively, simulations could be added to the pilot in order to maximize the learning potential.

4.4.2 Focus groups (cross-border testing)

Employees from the Data Evaluator and the Data Owner will be involved in all pilot situations, where their country establishes cross-border exchange of evidence with another Member State that participates in the DBA pilot. Recruiting employees at the DE and the DO will be coordinated by:

Table 73: DE and DO employee recruitment coordinators

Country	Coordinator
AT	Olga Suchow
NL	Ivar Vennekens
RO	Danut Tiparu
SE	Hans Ekstål

The four countries participating in the DBA pilot, all have their individual infrastructure to accommodate the pilot, allowing for real life piloting to a different degree. Some Member States are able to facilitate real eProcedures, resulting in real live and legally valid registrations and service fulfilment. Other countries facilitate simulated eProcedures that allow for companies to participate, but not resulting in a legally valid registration or service fulfilment because of usage of simulated data and/or simulated portals.

The participating Member States aim to use different types of eProcedures, resulting in different piloting possibilities between Member States (and user groups to involve):

Table 74: Combinations to pilot

			Data Provider Member State			
			Romania	Sweden	The Netherlands	Austria
			Real data	Fictitious data	Real data	Real data
Data Consumer Member State	RO	Simulated eProcedure		Fictitious companies	Dutch companies of professional network	Austrian companies of professional network
	SE	Simulated eProcedure	Romanian companies of professional network		Dutch companies of professional network	Austrian companies of professional network
	NL	real eProcedure	Invited Romanian Companies			Invited Austrian Companies
	AT	real eProcedure	Invited Romanian Companies		Invited Dutch Companies	

Summarizing: for real (invited) companies that are actually aiming to do business in the DC MS, it is required that the DE facilitates a real eProcedure. Otherwise, real companies could be involved that would not aim to do business abroad (or perhaps consent to be registered abroad without any further consequences) but are willing to participate in the pilot for registration purposes only. These are considered to be companies within the professional network of DBA partners. If the DP Member State facilitates fictitious data, only fictitious companies will pilot wit DC Member State that facilitate simulated eProcedures. DP Member State facilitating fictitious data will never pilot with DC Member State facilitating real eProcedures. Finally, DP Member State providing real data can pilot DC Member State providing simulated eProcedures, under strict conditions of data-protection.

4.4.3 User communication and feedback

For the pilot, a microsite will be set up, providing (in English):

- Information on the advantages of the DE4A approach
- More information on the objectives, uses cases, scope and planning of the DBA pilot

- An invitation for companies and representatives to join the pilot (including an enrolment form, informed consent)
- Videos and images on the pilot steps
- A restricted area (after logging in) will be considered (depending on available facilities, resources and participants), containing feedback forms (questionnaires) that can be used by companies and representatives involved in the DBA pilot. These forms contain questions corresponding to the metrics of Pilot benefits logic and metrics. This area is accessible for all users involved in the DBA pilot (see User involvement strategy). Alternatively, a regular questionnaire will be distributed among the pilot participants.

The DBA pilot lead will propose texts and structure, while the participating Member States translate and implement this microsite (using national or a shared infrastructure).

The DBA partners will reach out to users that enrolled to the pilot, by providing short newsletters or e-mails, containing (only) relevant information on the status and actions that are requested. With this, the user's involvement will be secured and maintained prior to, and during the pilot. The DBA pilot team will set up the communication in English, but participating Member States could also choose to translate this to their native language in order to ensure inclusion in their country.

Additionally, during the pilot the users will be invited for a short walkthrough of the questionnaire forms that they have filled out, in order to clarify some results or ask for more qualitative feedback on the DE4A solution.

At the end of the pilot, all users will be informed on the results and high-level lessons learned from each pilot run.

4.4.4 User involvement activities

The following high-level activities are scheduled prior to the pilot runs (in random order):

Table 75: User involvement activities

Activity id	Activity	Owner
DBA-UI-1	Prepare invitation for user categories	DE
DBA-UI-2	Invite users (all types)	DE
DBA-UI-3	Set up user management (lists and control sheets)	DE
DBA-UI-4	Organize eIDs and mandates for real users	DE
DBA-UI-5	Set up microsite (templates)	Pilot Lead / DE
DBA-UI-6	Implement microsites	DBA MS
DBA-UI-7	Finalize questionnaire forms	Pilot Lead / DE
DBA-UI-8	Set up and share newsletters	Pilot Lead / DE
DBA-UI-9	Design walkthroughs of filled in questionnaires	Pilot Lead / DE
DBA-UI-10	Design fictitious company cases with users	DE

5 Customization and integration pilot management plan

This chapter addresses the *planning* for the customization & integration, testing and user involvement activities to be taken by all DBA participants in order to launch the pilots (as defined in Pilot design) in detail for the first pilot iteration and high-level for the second pilot iteration. This chapter specifies the first iteration milestones (5.2) that the pilot partners need to achieve as well as the activities (as specified in the previous chapter) that are needed for doing so (5.3). The sections 5.4, 5.5 and 5.6 specify the prerequisites and dependencies for performing the activities as well as risks identified. Section 5.7 provides the preliminary setup of the second pilot iteration.

The activities have been detailed into Member State specific tasks to perform. These tasks have been carefully planned by all pilot partners in order to launch the pilot as much as possible at the same time with the functionality agreed upon. The Member State specific planning of the tasks to perform by that Member State will be addressed in chapter 6.

This chapter starts with an overview of the phasing of the two pilot iterations (5.1).

5.1 High-level management plan

The pilot consists of two pilot iterations. Starting from the DBA "use case definition and requirements"-phase (D4.5 [2]), both pilot iterations are organised in the following phases:

- Pilot planning, including pilot design and design of the solution architecture (D4.6).
- Customization and integration, including testing and pilot go-live (D4.7).
- Pilot running, including evaluating and reporting (D4.7).

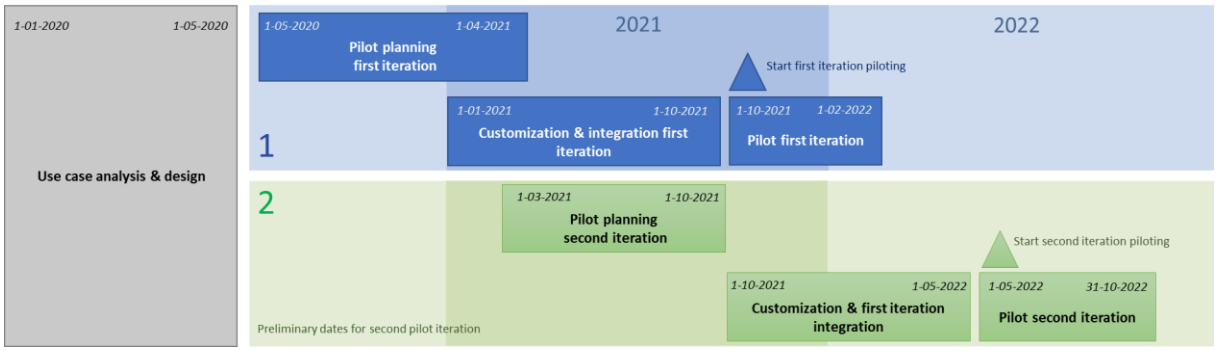


Figure 15: DBA pilot phases

The exact scope and contents of the *first pilot iteration* has been specified in the pilot design (Chapter 3) and the solution architecture (Annex 1 – Solution architecture). These focus on the Minimum Viable Product. In the customization & integration phase the common and national specific components needed for piloting the MVP will be customized, deployed, configured, connected and tested. Also, users will be involved for running the pilot. After meeting the go-live criteria the running phase for the first pilot iteration starts. The running phase ends after evaluating the results.

The exact scope and contents of *second iteration* will become clear gradually during the pilot planning phase for the second iteration. In pilot planning-phase for the second iteration the processes to pilot will be designed and a solution architecture for the additional two interaction patterns will be

constructed. By this, functionality and components will be specified to include in the second pilot iteration. Furthermore, the results of the first iteration will be input for the second one.

Please note that the timeliness for both iterations overlap in order to respect deadlines on the DE4A project level. As a result, priorities need to be managed carefully.

5.2 First iteration milestones

Pilot partners all have their own pilot scenarios, national components, infrastructure, resources and test organization. That greatly dictates the (scheduling of the) effort of the partner to perform the activities defined in the Pilot implementation activities and by that launch the pilot. As all DBA pilot scenarios are cross-border, there are milestones to be met by all participants (independently of their national effort to meet these). The milestones safeguard synchronous launching the pilot.

The first iteration milestones for eIDAS are:

Table 76: eIDAS first iteration milestones

#	Milestone	Date
1	eIDAS for natural persons up and running	30-04-2021
2	eIDAS for legal persons up and running	30-06-2021
3	powers validation implemented	30-09-2021

The first iteration milestones for OOP TS are:

Table 77: OOP TS first iteration milestones

#	Milestone	Date
1	“Hello Europe” in lab	28-02-2021
2	“Hello Europe” between two connected Member States	30-04-2021
3	full scale cross-border communication for all Member States	30-06-2021
4	ready to start pilot	30-09-2021

These DBA milestones require WP5 to meet their original release planning and come through with the OOP TS common components and the playground according to the requested delivery dates. Any changes in the availability of these common components and/or playground will unavoidably result in changes of the DBA milestones as well.

5.3 First iteration planning

5.3.1 eIDAS milestone 1: eIDAS for natural persons up and running

Table 78: eIDAS milestone 1 definition

end date	30-04-2021
result	▸ eIDAS for natural persons implemented on pilot node ▸ national IdP connected to node ▸ eIDAS node connected to nodes of the other DBA pilot Member States
required customization & integration activities	DBA-AC-1: Deploy and configure dedicated eIDAS connector
	DBA-AC-2: Connect to eIDAS proxies of piloting partners' Member States
	DBA-AP-1: Deploy and configure dedicated eIDAS proxy
	DBA-AP-2: Deploy and configure dedicated eIDAS proxy
	DBA-AP-3: Integrate national Identity Provider(s) to the national eIDAS proxy
Required cross-border testing activities	DBA-TE-1: Cross-border integration testing of eIDAS nodes, including IdP

5.3.2 eIDAS milestone 2: eIDAS for legal persons up and running

Table 79: eIDAS milestone 2 definition

end date	30-06-2021
result	▸ Legal attributes added to eIDAS ▸ eIDAS login available on eProcedure portals
required customization & integration activities	DBA-AP-4: Integrate Legal Person attribute provider to the national eIDAS proxy
	DBA-DE-1: Adapt the eProcedure portal for piloting with eIDAS
	DBA-DE-2: Connect the eProcedure portal to the dedicated eIDAS pilot connector to send authentication requests and receive the authentication results
Required cross-border testing activities	DBA-DT-2: Cross-border integration testing of eIDAS nodes, including eProcedure portal, IdP and AP.

5.3.3 eIDAS milestone 3: powers validation implemented

Table 80: eIDAS milestone 3 definition

end date	30-09-2021
result	Data provider validates whether the user has full powers to act on behalf of the company.
required customization & integration activities	DBA-AP-5: Integrate mandate management system, including logic to validate full powers.

Required cross-border testing activities	DBA-TE-3: Cross-border integration testing of eIDAS nodes, including eProcedure portal, IdP, AP and MMS.

5.3.4 OOP TS milestone 1: "Hello Europe" in lab

Table 81: OOP TS milestone 1 definition

end date	28-02-2021	
result	▸ Simple message exchange between two eDelivery instances centrally hosted by WP5 to show the common components are available, can connect and have been tested (technical prerequisites). ▸ This milestone is WP3/WP5 internal.	
Required customization & integration activities	N/A	N/A
Required cross-border testing activities	N/A	N/A

5.3.5 OOP TS milestone 2: "Hello Europe" between two connected Member States

Table 82: OOP TS milestone 2 definition

end date	30-04-2021	
result	▸ Simple message exchange between two pilot partners (RO and NL) to show the common components can be deployed and configured (easily) by the Member States.	
required customization & integration activities	DBA-DR-1: Deploy and configure OOP TS common components	*At least two Member States*
	DBA-DR-2: Connect to eDelivery AS4 gateways of data transferors.	*At least two Member States*
	DBA-DT-1: Deploy and configure OOP TS common components	*At least two Member States*
	DBA-DT-2: Connect to eDelivery AS4 gateways of data requestors.	*At least two Member States*
Required cross-border testing activities	DBA-TE-4: Cross-border integration testing OOP TS components	*At least two Member States.*

5.3.6 OOP TS milestone 3: full scale cross-border communication for all Member States

Table 83: OOP TS milestone 3 definition

end date	30-06-2021	
result	▸ all pilot DC's and DP's have been connected to OOP TS and can exchange evidence. ▸ Data services ready for piloting.	
required customization & integration activities	DBA-DR-1: Deploy and configure OOP TS common components	*All Member States.*
	DBA-DR-2: Connect to eDelivery AS4 gateways of data transferors.	*All Member States.*
	DBA-DT-1: Deploy and configure OOP TS common components	*All Member States.*
	DBA-DT-2: Connect to eDelivery AS4 gateways of data requestors.	*All Member States.*
	DBA-DE-3: Connect the eProcedure portal to national OOP TS implementation (DE4A connector) to request an evidence and to receive the evidence	*All Member States.*
	DBA-DO-1: Adapt the data service for providing the canonical company registration evidence	*All Member States.*
	DBA-DO-2: Connect the data service to the national OOP TS implementation (DE4A connector) to receive an evidence request and send the evidence	*All Member States.*
Required cross-border testing activities	DBA-TE-5: Cross-border integration testing OOP TS components, including eProcedure portal and data service.	*All Member States.*
User involvement activities	DBA-UI-1: Prepare invitation for user categories	
	DBA-UI-5: Set up microsite (templates)	
	DBA-UI-6: Implement microsites	

5.3.7 OOP TS milestone 4: ready to start pilot

Table 84: OOP TS milestone 4 definition

end date	30-09-2021
result	▸ eProcedure portal full pilot functionality ready, including preview & explicit request.
required customization & integration activities	DBA-DE-4: Implement SDG functionality in eProcedure portal
Required cross-border	DBA-TE-6: Functional use case testing
	DBA-TE-7: Cross-border production testing

testing activities	
User involvement activities	DBA-UI-2: Invite users (all types)
	DBA-UI-3: Set up user management (lists and control sheets)
	DBA-UI-4: Organize eIDs and mandates for real users
	DBA-UI-7: Finalise questionnaire forms
	DBA-UI-8: Set up and share newsletters
	DBA-UI-9: Design walkthroughs of filled in questionnaires
	DBA-UI-10: Design fictitious company cases with users

5.4 First iteration prerequisites

The milestone definitions, activities and timelines are based on four major assumptions that must proof stable and valid in order to maintain the pace and results that is described in this chapter.

- The assumption that the decisions described in paragraph 3.3 will hold during the customization & integration phase of the first pilot iteration, as they provide the foundation for the pilot scope and solution that will facilitate the first pilot iteration.
- The assumption that the (external) deliverables of other work packages that this pilot is depending on (see paragraph 5.5) are timely available and usable.
- The assumption that all DBA partner Member States can resolve individual challenges (like getting approvals and allocating resources) and set up their national solutions according to the milestone to achieve. If one or more Member States cannot keep the pace that is needed, this means that integration and testing efforts will take longer for all other participating Member States as well. This not only complicates the organization of activities for each Member State, but also requires more effort and is therefore putting additional stress on the available budgets.
- The assumption that the available budget in participating Member States suffices for developing the facilities needed to prepare and run the first pilot iteration.

5.5 First iteration dependencies

The activities to perform are interdependent. The diagram below shows the logical order of performing the activities.

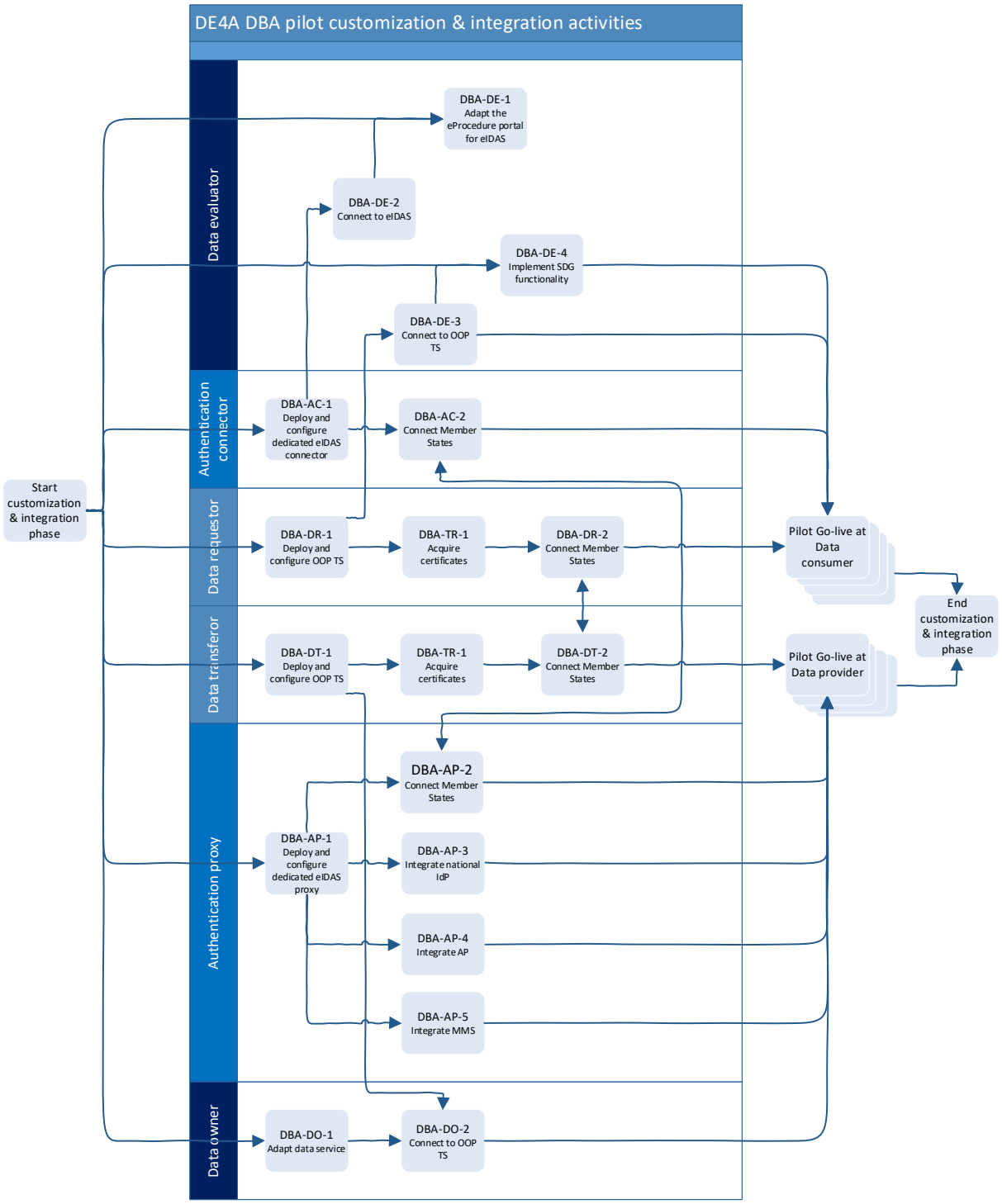


Figure 16: Customization & integration activity interdependency

The activities to perform are dependent on deliverables from other work packages in the DE4A project as well. Possible additional dependencies that exist in individual Member States will be described in MS customization & integration management plan "MS Customization and integration management plans".

Table 85: Customization & integration dependencies on other work packages

ID	Activity	Externally dependent on	To be provided by
DBA-AC-1	Deploy and configure dedicated eIDAS connector	CEF reference software and CEF eIDAS specifications	CEF (available)
DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States	Trust certificate providers	National CA's
DBA-AP-1	Deploy and configure dedicated eIDAS proxy	CEF reference software and CEF eIDAS specifications	CEF (available)
DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States	Trust certificate providers	National CA's
DBA-DR-1	Deploy and configure OOP TS common components:	▸ DE4A connector, first version for milestone 1 and updated versions for milestone 2 and 3 ▸ ESL (IDK) configuration file ▸ DNS & SML ▸ DE and DO stubs	WP5 WP3 CEF WP5
DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.		
DBA-DT-1	Deploy and configure OOP TS common components	▸ DE4A connector, first version for milestone 1 and updated versions for milestone 2 and 3 ▸ ESL (IDK) configuration file ▸ DNS & SML ▸ DE and DO stubs	WP5 WP3 CEF via WP5 WP5
DBA-TR-1	Acquire required (PKI) certificates	Trust certificate providers	National CA's WP5 test-CA
DBA-DE-3	Connect the eProcedure portal to national OOP TS implementation (DE4A connector)	DE4A connector stub	WP5
DBA-DE-4	Implement SDG functionality in eProcedure portal	GUI guidelines and wireframes for explicit request and preview	WP5
DBA-DO-2	Connect the data service to the national OOP TS implementation (DE4A connector)	DE4A connector stub	WP5

5.6 First iteration risks

Common risks (not Member State Specific) for the first pilot iteration are addressed in this table.

These risks will be actively monitored during the bi-weekly DBA stand-ups by the pilot partners. The pilot lead will facilitate this process and escalate risks as soon as they require mitigation actions that

are beyond the pilot itself. The risk table will be updated accordingly during the customization & integration phase.

Table 86: First iteration risks

ID	Risk description	Measures	Impact	Chance	Risk
1	For those participating Member States that apply the SEMPER solution in the first pilot iteration, a risk exists from the fact that per January 1st 2021 the SEMPER solution is not maintained and there is no formal support available in case of questions of problems. The latest CEF eIDAS version that is supported by SEMPER is version 2.4, while version 2.5 is released recently by CEF.	Agree on use of eIDAS node 2.4 (and not 2.5) Rely on informal network with TUG and RVO for questions and documentation.	Medium	Medium	Medium
2	Not all participating Member States will move at the same pace in customization and integration. Delays in one Member State may impact the pace of others in their cross-border activities.	Bi-weekly progress meetings (stand-ups) to monitor progress. Escalation by the pilot lead to pilot management if needed.	Medium	High	High
3	The common OOP TS components initially may have issues, bugs or lacking documentation preventing the piloting partners to achieve the milestones in time.	Provide feedback to WP5 on implementation efforts. Agree with WP5 on timeliness for fixes and updates of the common components. Have WP5 test the components first in the WP5 lab before releasing to the pilot partners. Escalate to pilot management if needed.	High	Medium	High
4	Exchange and configuration of certificates and metadata may take a long time preventing piloting partners to achieve the milestones in time.	Request for a clear exchange procedure. Organise connectathons.	Medium	Medium	Medium
5	From October the first, iteration 1 and 2 run in parallel (pilot planning for iteration 2 starts then). The efforts on iteration 2 may prevent full focus on running the first pilot iteration.	Continue preparation for iteration 2 with the most actively involved / most interested partners only in order to allow the other partners to fully focus on iteration 1.	Medium	High	High

ID	Risk description	Measures	Impact	Chance	Risk
		Escalate to pilot management for priorities of needed.			
6	The DE4A project pilots some of the concepts that have been defined in the SDGR, but also explores topics beyond the SDGR. With the commission continues preparation for implementing the SDGR in parallel, Member States might prioritise SDGR preparatory actions above DE4A actions. This risks Member State involvement and progress.	Keep explaining the DE4A project philosophy (provide real life input for implementing SDGR and exploring beyond SDGR). Allow for piloting Member States to go live at different points in time. Allow for front-running Member States (the first Member States to run the pilot) and follow-up Member States.	Medium	Medium	Medium
7	Member States may reconsider major design decisions at pilot level in the customization & integration phase. This risks re-doing work, redesigning the pilot process and the components required. Deviating from design decisions might lead to lack of interoperability and not reaching pilot goals.	Pilot lead will limit discussion on topics already agreed upon by all Member States. If needed, bilateral meetings between the pilot partner and pilot lead will be organised to discuss possible solutions.	Medium	Medium	Medium

5.7 Second iteration

The contents of the second iteration have been defined in section Second iteration. The main focus is on the two additional patterns: subscription & notification and Lookup. Additionally, the second iteration will implement functionality of the intermediation pattern that goes beyond the minimum viable product of the first iteration, e.g. support for sending a token of explicit request (proving to the data provider that the user requested the evidence via the OOP TS). On a detailed level, the improvements to the intermediation pattern stemming from running the first pilot iteration may be included in the second iteration. The DBA pilot will hold back on adding to many features identified in running the first iteration, as this complicated the preparation for the second pilot iteration: the customization & integrating of the second iteration runs in parallel to running the first pilot iteration.

Although the scope of the second pilot iteration has been defined clearly on a high-level, the second iteration lacks the architecture for the two additional, needs the pilot processes still to be designed and the software architecture to be constructed. This is included in the customization & integration phase that starts October the 1st of 2021. These results are starting point for defining activities to perform, the milestones to achieve and identifying impact and gaps on a Member State level. Hence, the second iteration has been planned at a high-level only at this point in time.

5.7.1 Milestones

The table below presents the milestones for the second pilot iteration:

Table 87: Second iteration milestones

Phase	Exp. date	Milestone
	1-06-2021	Project start architecture for S&N and Lookup patterns ready (WP2).
Pilot planning	1-08-2021	Pilot design second iteration finished
	1-09-2021	Solution architecture for the second iteration finished
	1-10-2021	Pilot planning for the second iteration detailed
Customization & integration	1-12-2021	Additional features to the intermediation pattern available (WP3 and WP5).
	1-01-2022	SEMPER extension deployed to the eIDAS nodes of piloting partners.
	1-02-2022	Additional features to the intermediation pattern integrated by pilot partners and ready to pilot.
	1-02-2020	Components for the S&N pattern available for pilot patterns (WP3 and WP5).
	1-04-2020	Components for the Lookup pattern available for pilot patterns (WP3 and WP5).
	1-05-2020	Components for the S&N pattern deployed, configured and integrated by pilot partners. eProcedure portals adapted and data services ready for piloting S&N.
	1-07-2020	Components for the Lookup pattern deployed, configured and integrated by pilot partners. eProcedure portals adapted and data services ready for piloting the Lookup pattern.
Pilot running phase	1-05-2022	Go-live with second iteration pilot.
	31-10-2022	Second iteration pilot finished.
	31-10-2022	Reporting on second iteration pilot finished.

Milestones for the customization & integration phase will be detailed once the pilot design and solution architecture have been finalised.

5.7.2 Risks

The common risks (not Member State specific) for the first pilot iteration are addressed in the table below. These risks will be actively monitored during the bi-weekly DBA stand-ups by the pilot partners. The pilot lead will facilitate this process and escalate risks as soon as they require mitigation actions that are beyond the pilot itself. The risk table will be updated accordingly during the customization & integration phase.

Table 88: Second iteration risks

ID	Risk description	Measures	Impact	Chance	Risk
1	From October the first, iteration 1 and 2 run in parallel (pilot planning for iteration 2 starts then). The efforts on iteration 2 may prevent full focus on running the first pilot iteration.	Escalate to pilot management for priorities.	Medium	High	High
2	The subscription & notification pattern goes 'beyond the SDRG' with regard to general fraud prevention and use for services not covered by the SDGR. With the going into effect of the SDGR nearing, Member States may be less willing to explore this pattern.	Emphasize the explorative characteristics and research goals of the DE4A project. If needed, limit pilot partners' involvement in exploring the S&N pattern to the Member States that have most interest in exploring this pattern.	High	Low	Medium
3	The lookup pattern provides a lightweight alternative to the intermediation pattern. As soon as the intermediation pattern has been deployed successfully by the Member States, the willingness to explore the lightweight alternative may be less.	Emphasize the explorative characteristics and research goals of the DE4A project. If needed, limit pilot partners' involvement in exploring the Lookup pattern to the Member States that have most interest in exploring this pattern.	High	Low	Medium
4	The two new patterns are to be used in the DBA pilot only. There is no common ground with the other DE4A pilots in these patterns. Hence, the components to be developed by WP5, need to be developed for DBA only. This may create priority issues with the work WP5 has to do for the other pilots as well.	Agree with WP5 on timelines for the WP5 delivery of the required components Escalate to pilot management for priorities.	Medium	High	High

5.7.3 Prerequisites

General prerequisites for piloting the second iteration:

- Continued support from the DBA pilot partners for piloting the second iteration.
- Absence of delays in piloting the first iteration that may endanger the start of the second iteration.

5.7.4 Dependencies

At this point in time the following general dependencies exist:

- For creating the solution architecture for the S&N and Lookup patterns, the Project start architecture [3] should be constructed for those patterns (WP2).

- For customization & integration of the second pilot iteration, the required software components need to be available (WP3 and WP5).
- A legal justification needs to be formulated for piloting the second iteration as the second iteration pilots' functionality beyond the SDGR (WP7).

6 MS customization & integration management plan

This chapter includes the Member State specific plan for execution of the “customizations and integration”-tasks. Each Member State specific section includes national design decisions that impact the pilot, the gaps that have been identified (defining the amount of work to be done for customization and integration), the planning of the tasks to perform and the identification of Member State specific risks to be mitigated.

6.1 Austria

All detailed listed in this document are elaborated with the knowledge and current status within the parties involved in Austria in the DE4A project and may change or expand according to new circumstances and/or information.

The USP (Unternehmens-Service-Portal) provides numerous e-government applications for companies and entrepreneurs. With a single registration in the USP one can submit tax declarations (FinanzOnline), notifications to social insurance (ELDA online) and access to contribution accounts of the Austrian Health Insurance Fund (WEBEKU), SVS contribution account for authorized representatives, Environmental reports (EDM), and many other applications. Central administration of user roles and rights for e-government applications are provided in one place, as well as detailed information and tips on entrepreneurial activities, e.g. "Hiring employees", "Value-added tax", "Business in Austria" or "Company Register".

USP.gv.at is Data evaluator, according to OOP-Process, data will be stored in the ERsB (Registry for "other affected parties") and ERnP (via eIDAS) (Registry for natural persons) → USP requirement for account creation (nat. person + legal person match) The UR (Unternehmensregister) is Data Owner.

6.1.1 Specific design decisions

The pilots follow the major design decisions as specified in section 3.3 Major design decisions at pilot level. Furthermore, the following MS-specific design choices have been made:

1. eIDAS Semper Node of Semper project will be used and adapted for first iteration.
2. Canonical Evidence: Mapping of national company data evidence will take place on the data owner side (Austrian DE4A Orchestrator - pilot specific orchestration service (ADO) or USP → depending on requirements of 5.3), OOP process.
3. usp.gv.at registers new full powers companies.
4. AT will use the AS4 gateway integrated in the DE4A connector. No separate AS4 gateway will be connected and used. Client = phase 4.

6.1.2 Specific tasks

The tables below show the MS specific tasks that the Member State has to do in order to overcome the gaps that have been identified (refer to detailed design documents). To each task a unique id has been assigned.

eIDAS components customization and integration tasks

Table 89: eIDAS components tasks Austria

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-AC-1	Deploy and configure dedicated eIDAS connector	DBA-AC-1-1	Deployment and re-configuration for DE4A (Incoming)	BRZ	Test Node must be available.
DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States	DBA-AC-2-1	Configuration (Outgoing)	BRZ	
		DBA-AC-2-2	Connect NL	BRZ	
		DBA-AC-2-3	Connect RO	BRZ	
		DBA-AC-2-4	Connect SE	BRZ	
DBA-AP-1	Deploy and configure dedicated eIDAS proxy	DBA-AP-1-1	Deployment and Configuration	BRZ	Availability
DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States	DBA-AP-2-1	Configuration and Bug fixing	BRZ	DBA-AP-1
DBA-AP-3	Integrate national Identity Provider(s) to the national eIDAS proxy	DBA-AP-3-1	Integration and configuration	BRZ	DBA-AP-1 DBA-AP-2
DBA-AP-4	Extend eIDAS: Integrate Attribute providers	DBA-AP-4-1	Design, implement, and deploy	BRZ	DBA-AP1 and DBA-AP2
DBA-AP-5	Extend eIDAS: integrate Mandate management System, including logic to validate full powers.	DBA-AP-5-1	Design, implement, and deploy	BRZ	DBA-AP4

eIDAS for DE4A will be implemented together with Austrian organization A-Sit (To-be Subcontractor).

OOP TS components customization and integration tasks

Table 90: OOP TS Components tasks Austria

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DR-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery	DBA-DR-1-1	1 Acquire infrastructure	BRZ	WP5 delivers De4A connector that is fully

	AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.		2 Deploy DE4A Connector with Phase4 as the AS4 Gateway 3 Deploy SMP 4 Configure SMP		working, tested according to ISTQB, and secure to run in critical infrastructure.
DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.	DBA-DR-2-1	No tasks	BRZ	
DBA-DT-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DT-1-1	No tasks – identical to DBA-DR-1	BRZ	
DBA-DT-2	Connect to eDelivery AS4 gateways of data requestors.	DBA-DT-2-1	No tasks	BRZ	
DBA-TR-1	Acquire required (PKI) certificates	DBA-TR-1-1	1 Ask for AS4 certificate 2 Ask for SMP certificate	BRZ	WP5 publishes guidelines on how to request certificates and provides support

eProcedure portal specific tasks

Table 91: eProcedure tasks Austria

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DE-1	Adapt the eProcedure portal for piloting with eIDAS: - Optionally set up a pilot portal (real data, real users) - Add eIDAS login option for users - Show the user that he/she has successfully logged authenticated on behalf of the company	DBA-DE-1-1	Integration of Interfaces	BRZ	Interfaces are available --> WP5

DBA-DE-2	Connect the eProcedure portal to eIDAS	DBA-DE-2-1	Implementation of link to eIDAS test node for DE4A	BRZ	eIDAS components customization and integration tasks
		DBA-DE-2-2	Retrieval of MDS	BRZ	eIDAS components customization and integration tasks
		DBA-DE-2-3	Data input to ERnP	BRZ	Access to ERnP
DBA-DE-3	Connect the eProcedure portal to OOP TS	DBA-DE-3-1	Create technical application	BRZ	
		DBA-DE-3-2	Connect to DE4A connector	BRZ	
		DBA-DE-3-3	Integrate with eProcedure Portal	BRZ	
		DBA-DE-3-4	Integrate with Austrian data hub	BRZ	
		DBA-DE-3-5	Data input to ERsB	BRZ	
DBA-DE-4	Implement SDG functionality in eProcedure portal	DBA-DE-4-1	Provide pilot UI for Company Registration (in Ado DC)	BRZ	
		DBA-DE-4-2	Display Preview to the user, and allow accept/decline	BRZ	
		DBA-DE-4-3	Upon acceptance create record in ERsB Display process results to the data subject	BRZ	

Data service specific tasks

Table 92: Data Service tasks Austria

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DO-1	Adapt the data service for providing the canonical company data evidence	DBA-DO-1-1	Define and implement mapping from national data structure to canonical evidence	BRZ	Will be part of application created in DBA-DE-3-1
DBA-DO-2	Connect the data service to the national OOP TS implementation (DE4A connector) to receive an evidence request and send the evidence	DBA-DO-2-1			Handled in DBA-DE-3-2

6.1.3 Planning

Activity		Task id	MS specific task	Change owner	Effort	mrc	apr	may	jun	jul	aug	sep	oct	nov	dec
eIDAS components customization and integration tasks															
DBA-AC-1	Deploy and configure dedicated eIDAS connector	DBA-AC-1-1	Deployment and configuration. (Incoming)	BRZ	M			eIDAS Milestone 1 - eIDAS for natural persons up and running							
DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States	DBA-AC-2-1	Configuration	BRZ	S										
		DBA-AC-2-2	Connect NL	BRZ	S										
		DBA-AC-2-3	Connect RO	BRZ	S										
		DBA-AC-2-4	Connect SE	BRZ	S										
DBA-AP-1	Deploy and configure dedicated eIDAS proxy	DBA-AP-1-1	Deployment and Configuration	BRZ	S										
DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States	DBA-AP-2-1	Configuration and Bug Fixing	BRZ	S										
DBA-AP-3	Integrate national Identity Provider(s) to the national eIDAS proxy	DBA-AP-3-1	Integration and Configuration	BRZ	S										
DBA-AP-4	Extend eIDAS: integrate Attribute provider for legal person attributes	DBA-AP-4-1	Design, implement, and deploy	BRZ	M					eIDAS Milestone 2 - eIDAS for legal persons up and running and available in eProcedure porta					
DBA-AP-5	Extend eIDAS: Integrate Mandate management System including logic to validate full powers.	DBA-AP-5-1	Design, implement, and deploy	BRZ	M								eIDAS Milestone 3 - powers validation implem		
OOP TS components customization and integration tasks															
DBA-DR-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DR-1-1	Acquire infrastructure	BRZ	M			Milestone 2 - "Hello Europe" between two connected member states							
		DBA-DR-1-2	Deploy DE4A Connector with Phase4 as the AS4 Gateway	BRZ	S					Milestone 3 - full scale cross border communication for all member states					
		DBA-DR-1-3	Deploy SMP	BRZ	S										
		DBA-DR-1-4	Configure SMP	BRZ	S										
DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.		No action needed	BRZ	S			Milestone 2 - "Hello Europe" between two connected member states							
			No action needed	BRZ	S					Milestone 3 - full scale cross border communication for all member states					
DBA-DT-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL	DBA-DT-1-1	Same as DBA-DR-1-1	BRZ	M			Milestone 2 - "Hello Europe" between two connected member states							
		DBA-DT-1-2	Same as DBA-DR-1-2	BRZ	S										
		DBA-DT-1-3	Same as DBA-DR-1-3	BRZ	S										
		DBA-DT-1-4	Same as DBA-DR-1-4	BRZ	S					Milestone 3 - full scale cross border communication for all member states					
DBA-DT-2	Connect to eDelivery AS4 gateways of data requestors.		No action needed	BRZ	S			Milestone 2 - "Hello Europe" between two connected member states							
			No action needed	BRZ	S					Milestone 3 - full scale cross border communication for all member states					
DBA-TR-1	Acquire required (PKI) certificates	DBA-TR-1-1	Ask for AS4 certificate	BRZ	S			Milestone 2 - "Hello Europe" between two connected member states							
eProcedure portal specific tasks															
DBA-DE-1	Adapt the eProcedure portal for piloting with eIDAS:	DBA-DE-1-1	Add possibility for user to login/register	BRZ	L					eIDAS Milestone 2 - eIDAS for legal persons up and running and integrated in eProcedure port					
DBA-DE-2	Connect the eProcedure portal to eIDAS	DBA-DE-2-1	Use broker service ("Ado Login") for	BRZ	M					eIDAS Milestone 2 - eIDAS for legal persons up and running and integrated in eProcedure port					
DBA-DE-3	Connect the eProcedure portal to national OOP TS implementation (DE4A connector) to request an evidence and to receive the evidence.	DBA-DE-3-1	Create technical application ("Ado DC")	BRZ	M					Milestone 3 - full scale cross border communication for all member states					
DBA-DE-4	Implement SDG functionality in eProcedure portal:	DBA-DE-4-1	Implement Company Registration in Ado	BRZ	M								Milestone 4 - ready to start pilot		
Data service specific tasks															
DBA-DO-1	Adapt the data service for providing the canonical company data evidence:	DBA-DO-1-1	Provide data type mapping from UR/ERsB data	BRZ	S					Milestone 3 - full scale cross border communication for all member states					
DBA-DO-2	Connect the data service to the national OOP TS implementation (DE4A connector) to receive an evidence request and send the evidence:	DBA-DO-2-1	Already part of the "Ado DC" application	BRZ	S										

Figure 17: Planning

6.1.4 Specific risks

Next to the common pilot risks as described in First iteration risks, some additional risks were identified on a National level. To estimate the severeness of the risk, the following matrix is used:

Table 93: Risk classification

Chance of risk occurring	Impact when risk occurs		
	Low	**Medium**	**High**
High	Medium	High	High
Medium	Low	Medium	High
Low	Low	Low	Medium

For risks in the orange and red category measures are defined. These risks will be actively monitored.

Table 94: Risk Analysis Austria

ID	Description	Measures	Impact	Chance	Risk
1	Higher efforts due to changes to the eIDAS Semper Node		Low	High	Medium
2	National political decisions against DE4A design principles and implementations		High	Low	Medium
3	Delay in the planning phase due to two technical restrictions concerning test environment vs. prod environment		Medium	Medium	Medium
4	Missing alignment with WP5 concerning planning and requirements		High	High	High

6.2 The Netherlands

RVO provides several services for companies (e.g. regulations) that are not restricted to Dutch companies. In order to qualify for the service, the company must provide the necessary data. Besides the specific data required to qualify for the service, RVO also requires general data of the company itself, for identification, communication and compliance purposes. RVO stores this company data in a central ('customer') registry that is used for most RVO services. This scenario entails a non-Dutch company that applies for a service carried out by RVO.nl. In this process, the company does not have to supply information to RVO that is already known to the data provider in a Member State (the country of company registration). RVO.nl is able to retrieve this information from the data provider. Keeping this information up to date is out of scope but will be part of the implementation of the subscription and notification interaction pattern, that will be part of the second iteration.

RVO also host the national eIDAS node and will set up the DE4A connector as data requestor and data transferor.

The Dutch Chamber of Commerce (KVK) hosts the Dutch Business register. This register is integrated in the Dutch scheme of Base Registries that focus on maximizing re-use of base registries in the

Netherlands. The requirement for re-use of base registries in The Netherlands has been included in National law. All base registries, like the Dutch Business Register, operate webservices for retrieval of data. The currently available webservices of the Dutch Business Register will be used for the DBA pilot as well.

6.2.1 Specific design decisions

The pilots follow the major design decisions as specified in section 3.3 of D4.6. Furthermore, the following MS-specific design choices have been made:

1. Transformation of the national company data evidence to the DE4A canonical evidence will be implemented by the data transferor (RVO) and not by the data owner (KVK). This is to use DE4A specific knowledge as much as possible in development activities. From an architecture point of view, the transformation functionality remains a data owner responsibility.
2. RVO is preparing a renewal of RVO's company registration. For DBA piloting, the currently available applications will be used: ERB and REBUS.
3. The eProcedure portal MijnRVO needs to do record matching on the company that applies for a service at the portal. RVO will pre-match registered companies from piloting Member States prior to the pilot, whenever possible. This way, the operational process is not interrupted by the need to do record matching while the user is online. The extent to which this is possible, depends on the availability of company data prior to the pilot.
4. NL will use the AS4 gateway integrated in the DE4A connector (Phase4). No separate AS4 gateway will be connected and used.
5. NL will use ATLAS (simulation IdP) as an authentication means during development of the national eIDAS solution, and will switch to eHerkenning starting July 2021. The tokens used will operate via App or SMS.

6.2.2 Specific tasks

The tables below show the Member State specific tasks that the Member State has to do in order to overcome the gaps that have been identified (refer to detailed design documents). To each task a unique id has been assigned.

6.2.2.1 eIDAS components customization and integration tasks

Table 95: eIDAS components tasks The Netherlands

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-AC-1	Deploy and configure dedicated eIDAS connector	DBA-AC-1-A	reconfigure and upgrade (2.4) SEMPER node for DE4A	RVO	Required SEMPER instance to be available for reconfiguring by DE4A.
DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States	DBA-AC-2-A	connect AT	RVO	Required other MS's availability of node and resources.
		DBA-AC-2-B	connect RO	RVO	Required other MS's availability of node and resources.

		DBA-AC-2-C	connect SE	RVO	Required other MS's availability of node and resources.
		DBA-AC-2-D	Change certificates	RVO	
DBA-AP-1	Deploy and configure dedicated eIDAS proxy	DBA-AP-1-A	see DBA-AC-1	RVO	Required SEMPER instance to be available for reconfiguring by DE4A.
DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States	DBA-AP-2-A	see DBA-AC-2	RVO	Required other MS's availability of node and resources.
DBA-AP-3	Integrate national Identity Provider(s) to the national eIDAS proxy	DBA-AP-3-A	Connect Atlas (simulated IdP)	RVO	
DBA-AP-4	Extend eIDAS: Integrate Attribute provide	DBA-AP-4-A	Connect latest version of eRecognition (1.13s) and adapt specific components accordingly.	RVO	Requires eRecognition version 1.13s to be up and running.
		DBA-AP-4-B	Connect to RvIG attribute provider	RVO	
DBA-AP-5	Extend eIDAS: integrate Mandate management System, including logic to validate full powers.		-	RVO	Requires eRecognition version 1.13s to be up and running.

6.2.2.2 OOP TS components customization and integration tasks

Table 96: OOP TS components tasks The Netherlands

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DR-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML.	DBA-DR-1-A	Deploy and configure DE4A connector	RVO	Availability of working DE4A connector from WP5 lab.
		DBA-DR-1-B	Connect to central SMP and populate SMP/DNS.	RVO	Availability of central SMP for DE4A / DBA.

	Populate ESL configuration file.	DBA-DR-1-C	Populate ESL configuration file.	RVO	Availability of configuration file from WP3 / WP5.
DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.	DBA-DR-2-A	Connect to eDelivery AS4 gateways of data transferor AT (including testing interoperability).	RVO	Availability of AS4 gateways of pilot partner Member States and resources.
		DBA-DR-2-B	Connect to eDelivery AS4 gateways of data transferor SE (including testing interoperability).	RVO	Availability of AS4 gateways of pilot partner Member States and resources.
		DBA-DR-2-C	Connect to eDelivery AS4 gateways of data transferor RO (including testing interoperability).	RVO	Availability of AS4 gateways of pilot partner Member States and resources.
DBA-DT-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DT-1-A	See DBA-DR-1	RVO	
DBA-DT-2	Connect to eDelivery AS4 gateways of data requestors.	DBA-DT-2-A	See DBA-DR-2	RVO	
DBA-TR-1	Acquire required (PKI) certificates	DBA-TR-1-A	Acquire required (PKI) certificates: create CSR's, receive certificates, configure certificates	RVO	Availability of DE4A PKI infrastructure and support team.

6.2.2.3 eProcedure portal specific tasks

Table 97: eProcedure tasks The Netherlands

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DE-1	Adapt the eProcedure portal for piloting with eIDAS:	DBA-DE-1-A	Add (separate) authentication option for DE4A-pilot. The regular eIDAS "button" cannot be	RVO-MijnRVO	

	- Optionally set up a pilot portal (real data, real users) - Add eIDAS login option for users - Show the user that he/she has successfully logged authenticated on behalf of the company		used as that will invoke the regular eIDAS node and not the dedicated pilot node.		
DBA-DE-2	Connect the eProcedure portal to eIDAS	DBA-DE-2-A	Pre-populate identities of existing companies for record-matching purposes	RVO-MijnRVO	
		DBA-DE-2-B	Configure connection between TVS and the pilot node.	RVO-MijnRVO	
DBA-DE-3	Connect the eProcedure portal to OOP TS	DBA-DE-3-A	MijnRVO: NL invoke DE4A connector	RVO-MijnRVO	
DBA-DE-4	Implement SDG functionality in eProcedure portal	DBA-DE-4-A	MijnRVO: Support explicit request flow with own software that implements the requirements on explicit request.	RVO-MijnRVO	
		DBA-DE-4-B	MijnRVO: Support presenting evidence status (success or failed)	RVO-MijnRVO	
		DBA-DE-4-C	MijnRVO: Adapt preview of evidence to DE4A-requirements: at least specific information on the role of the preview for the pilot will be added to the existing preview-screen and the user interface will also have to support the English language.	RVO-MijnRVO	
		DBA-DE-4-D	REBUS: check role in authentication process mijnrvo.nl. Is	RVO-MijnRVO	

			REBUS necessary for intermediation pattern If so: Functionality to store EU companies and ID's in REBUS. 10-02-2021: registration in REBUS is required.		
		DBA-DE-4-E	Integration Layer: Determine architecture and implementation of request to OOP node, alongside 'regular' requests to Dutch registries.	RVO-MijnRVO	
		DBA-DE-4-F	The RVO company register 'ERB' must accept EU companies and EUID. This is already possible, but we aim for a single registration request in the integration layer that takes care of REBUS (see DBA-DE-1-D) and ERB.	RVO-MijnRVO	

6.2.2.4 Data service specific tasks

Table 98: Data Service tasks The Netherlands

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DO-1	Adapt the data service for providing the canonical company data evidence	DBA-DO-1-A	Develop and test service for requesting KVK data, transforming into canonical evidence and constructing the evidence.	RVO	Availability of KVK data service and organisational agreement on use of this service for piloting DBA.
DBA-DO-2	Connect the data service to the national OOP TS implementation (DE4A connector) to receive an evidence	DBA-DO-1-B	Configure request to DE4A -data service (DBA-DO-1-A) and returning the answer received to the DE4A connector.	RVO	Availability of DE4A connector (mock-up first).

	request and send the evidence				

6.2.3 Planning

Activity		Task id	MS specific task	Change owner	Effort	mrc	apr	may	jun	jul	aug	sep	oct	nov	dec
eIDAS components customization and integration tasks															
DBA-AC-1	Deploy and configure dedicated eIDAS connector	DBA-AC-1-A	reconfigure SEMPER node for DE4A	RVO				eIDAS Milestone 1 - eIDAS for natural persons up and running							
DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States	DBA-AC-2-A	connect AT	RVO											
		DBA-AC-2-A	connect RO	RVO											
		DBA-AC-2-A	connect SE	RVO											
DBA-AP-1	Deploy and configure dedicated eIDAS proxy	DBA-AP-1-A	reconfigure SEMPER node for DE4A	RVO											
DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States	DBA-AP-2-A	connect AT	RVO											
		DBA-AP-2-A	connect RO	RVO											
		DBA-AP-2-A	connect SE	RVO											
DBA-AP-3	Integrate national Identity Provider(s) to the national eIDAS proxy	DBA-AP-3-A	Connect ATLAS (simulated IdP)	RVO											
DBA-AP-4	Extend eIDAS: integrate Attribute provider for legal person attributes	DBA-AP-4-A	Connect latest version of eRecognition (1.13s) and adapt specific components accordingly.	RVO						eIDAS Milestone 2 - eIDAS for legal persons up and runnin					
		DBA-AP-4-B	Connect RvIG attribute provider	RVO											
DBA-AP-5	Extend eIDAS: Integrate Mandate management System including logic to validate full powers.			RVO									eIDAS Milestone 3 - powers v		
OOP TS components customization and integration tasks															
DBA-DR-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DR-1-A	Deploy and configure DE4A connector	RVO				Milestone 2 - "Hello Europe" between two connected member states							
		DBA-DR-1-B	Connect to central SMP and populate SMP/DNS.	RVO											
		DBA-DR-1-C	Populate ESL configuration file.	RVO											
DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.	DBA-DR-2-A	Connect to eDelivery AS4 gateways of data transferor AT (including testing interoperability).	RVO											
		DBA-DR-2-B	Connect to eDelivery AS4 gateways of data transferor SE (including testing interoperability).	RVO						Milestone 3 - full scale cross border communication for a					
		DBA-DR-2-C	Connect to eDelivery AS4 gateways of data transferor RO (including testing interoperability).	RVO											
DBA-DT-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DT-1-A	Deploy and configure DE4A connector	RVO				Milestone 2 - "Hello Europe" between two connected member states							
		DBA-DT-1-B	Connect to central SMP and populate SMP/DNS.												
		DBA-DT-1-C	Populate ESL configuration file.												
DBA-DT-2	Connect to eDelivery AS4 gateways of data requestors.	DBA-DR-2-A	Connect to eDelivery AS4 gateways of data transferor AT (including testing interoperability).	RVO											
		DBA-DR-2-B	Connect to eDelivery AS4 gateways of data transferor SE (including testing interoperability).	RVO						Milestone 3 - full scale cross border communication for a					
		DBA-DR-2-C	Connect to eDelivery AS4 gateways of data transferor RO (including testing interoperability).	RVO											
DBA-TR-1	Acquire required (PKI) certificates	DBA-TR-1-A	Acquire required (PKI) certificates: create CSR's, receive certificates, configure cerificates	RVO				Milestone 2 - "Hello Europe" between two connected member states							
eProcedure portal specific tasks															
DBA-DE-1	Adapt the eProcedure portal for piloting with eIDAS:	DBA-DE-1-A	Add separate authentication option for DE4A-pilot	MijnRVO						eIDAS Milestone 2 - eIDAS for legal persons up and runnin					
DBA-DE-2	Connect the eProcedure portal to eIDAS - Invoke pilot eIDAS connector, including legal person attributes - Receive authentication result, including legal person attributes -(Receive authentication failed message and allow for re-authentication	DBA-DE-2-A	Pre-populate identities of existing companies for record-matching purposes	MijnRVO						eIDAS Milestone 2 - eIDAS for legal persons up and runnin					
		DBA-DE-2-B	Configure connection TVS with pilot eIDAS node	MijnRVO											
DBA-DE-3	Connect the eProcedure portal to national OOP TS implementation (DE4A connector) to request an evidence and to receive the evidence. -Send an evidence request to the DE4A connector	DBA-DE-3-A	MijnRVO: NL invoke DE4A connector	MijnRVO						Milestone 3 - full scale cross border communication for a					
DBA-DE-4	Implement SDG functionality in eProcedure portal: - Check whether the company has been registered at the eProcedure portal before	DBA-DE-1-A	MijnRVO: Support explicit request flow with own software that implements the requirements on explicit request.	MijnRVO									Milestone 4 - ready to start p		
	- If so, suggest the user to apply for a service (like F-tax, tax declaration or eServices defined by the Service directive)	DBA-DE-1-B	MijnRVO: Support presenting evidence status (success or failed)	MijnRVO											
	- If not, ask the user to explicit request to use the Technical system for direct retrieval of the data - Show the user a preview of the evidence in case requested by the user - After approval of the evidence, start company registration by pre-filling the registration form	DBA-DE-1-C	MijnRVO: Adapt preview of evidence to DE4A-requirements: at least specific information on the role of the preview for the pilot will be added to the existing preview-screen and the user interface will also have to support the English language.	MijnRVO											
	- Discard the evidence in case of denial of the evidence. - Allow the user to add missing values needed for company registration - Ask the user to confirm registration - Register the company (two registers involved: ERB and REBUS)	DBA-DE-1-D	REBUS: check role in authentication process mijnrvo.nl. Is REBUS necessary for intermediation pattern If so: Functionality to store EU companies and ID's in REBUS. 10-02-2021: registration in REBUS is required.	MijnRVO	medium			analysis	development	test	acc				
	- Suggest the user to apply for a service (like F-tax, tax declaration or eServices defined by the Service directive)	DBA-DE-1-E	Integration Layer: Determine architecture and implementation of request to OOP node, alongside 'regular' requests to Dutch registries.	MijnRVO	medium			analysis?							
		DBA-DE-1-F	The RVO company register 'ERB' must accept EU companies and EU iD. This is already possible, but we aim for a single registration request in the integration layer that takes care of REBUS (see DBA-DE-1-D) and ERB.	MijnRVO	medium			analysis	development	test	acc				
Data service specific tasks															
DBA-DO-1	Adapt the data service for providing the canonical company data evidence:	DBA-DO-1-A	Develop and test service for requesting KVK data, transforming into canonical evidence and constructing the	RVO						Milestone 3 - full scale cross border communication for a					
DBA-DO-2	Connect the data service to the national OOP TS implementation (DE4A connector) to receive an evidence request and send the evidence: -Receive and validate evidence request	DBA-DO-1-B	Configure request to DE4A -data service (DBA-DO-1-A) and returning the answer received to the DE4A connector.	RVO											
Data service specific tasks															
DBA-UI-1	Prepare invitation for user categories			MijnRVO											
DBA-UI-2	Invite users (all types)			MijnRVO											
DBA-UI-3	Set up user management (lists and control sheets)			MijnRVO											
DBA-UI-4	Organize eIDs and mandates for real users			MijnRVO											
DBA-UI-5	Set up microsite (templates)			MijnRVO											
DBA-UI-6	Implement microsites			MijnRVO											
DBA-UI-7	Finalize questionnaire forms			MijnRVO											
DBA-UI-8	Set up and share newsletters			MijnRVO											
DBA-UI-9	Design walkthroughs of filled in questionnaires			MijnRVO											
DBA-UI-10	Design fictitious company cases with users			MijnRVO											

Figure 18: Planning (II)

6.2.4 Specific risks

Next to the common pilot risks as described in First iteration risks, some additional risks were identified on a National level. To estimate the severeness of the risk, the following matrix is used:

Table 99: Risk classification

Chance of risk occurring	Impact when risk occurs		
	Low	**Medium**	**High**
High	Medium	High	High
Medium	Low	Medium	High
Low	Low	Low	Medium

For risks in the orange and red category measures are defined. These risks will be actively monitored.

Table 100: Risk Analysis The Netherlands

ID	Description	Measures	Impact	Chance	Risk
NLR1	An official confirmation to use existing DO production services without fees must be obtained before the pilot.		Medium	Low	Low
NLR2	During the development and/or first pilot iteration, an application (TVS) will be upgraded. This could interfere with the amount of effort to put in the current version, and the availability of resources for DE4A pilot development	Early and regular scheduling of the development for DE4A. Prepare to develop in the current as well as the next version.	Medium	Medium	Medium

6.3 Romania

In order for a foreign company to do business in Romania, that company has to register a new branch in the National Trade Register Office (ONRC). Currently this can be done by fulfilling an online procedure on ONRC portal, portal.onrc.ro. In this procedure, user will input the attributes of the new branch and also the information about the parent company. To prove his powers of representation that he has on the parent company, powers that allow him to register a new company branch, user will send documents through the online procedure. After the user submits all the necessary information, in the Backoffice, a legal expert (called “Designated Person”) with specific attributions will evaluate all the information submitted and approve or deny the registration of the new branch.

In this pilot scenario, a new online procedure will be implemented for registering a new branch. In this new online service, called from now on eService, the identification of the company representative, validation of his powers of representation and also the necessary parent company data will be requested directly from the Member State that has the original data. This Member State will be called Data Provider. The eService will be called “Open a new business” and it will run on a pilot version of

ONRC portal. Due to legal restrictions, the actual registration of the new branch cannot be done fully online. Thus, in this pilot the registration of that branch through eService will only fictive. After the branch is registered in ONRC and receives a registration number, it will be also registered in the Tax Agency register and it will receive a fiscal code.

6.3.1 Specific design decisions

The pilots follow the major design decisions as specified in section 3.3. Furthermore, the following MS-specific design choices have been made:

1. ONRC, who has both roles, data owner and data transferor, will implement the transformation of company data evidence into DE4A canonical evidence.
2. As there is no eIDAS node available in RO, ONRC will implement a dedicated eIDAS from scratch. Because one of the main goals of the project will be validating powers of representation in the authentication process, SEMPER extension is chosen as eIDAS implementation to be deployed and configured, even if in the first phase of the pilot powers of representation will not be validated.
3. As there is no identity provider (IdP) in RO, for this pilot ONRC will assume the role of an IdP and implement a dedicated eID.
4. As all online services currently available on ONRC's portal are in Romanian only, ONRC will implement a new simplified version, dedicated to the pilot, of an eService for registering new branches of foreign companies. The new service will use eIDAS only authentication.
5. RO will use the AS4 gateway integrated in the DE4A connector. No separate AS4 gateway will be connected and used.

6.3.2 Specific tasks

The tables below show the Member State specific tasks that the Member State has to do in order to overcome the gaps that have been identified (refer to detailed design documents). To each task a unique id has been assigned.

6.3.2.1 eIDAS components customization and integration tasks

Table 101: eIDAS components tasks Romania

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-AC-1	Deploy and configure dedicated eIDAS connector	DBA-AC-1-A	Deploy and configure a SEMPER node for DE4A	ONRC	Required SEMPER instance to be available for configuring by DE4A.
DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States	DBA-AC-2-A	connect AT, NL and SE	ONRC	Required other MS's availability of node and resources.
DBA-AP-1	Deploy and configure dedicated eIDAS proxy	DBA-AP-1-A	see DBA-AC-1	ONRC	Required SEMPER instance to be available for configuring by DE4A.

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States	DBA-AP-2-A	see DBA-AC-2	ONRC	Required other MS's availability of node and resources.
DBA-AP-3	Integrate national Identity Provider(s) to the national eIDAS proxy		A pilot dedicated IdP will be implemented and integrated with the dedicated eIDAS proxy.	ONRC	IdP to be available.
DBA-AP-4	Extend eIDAS: Integrate Attribute provide	DBA-AP-4-A	Connect pilot dedicated IdP and adapt specific components accordingly.	ONRC	IdP to be available.
DBA-AP-5	Extend eIDAS: integrate Mandate management System, including logic to validate full powers.		-	ONRC	SEMPER and IdP up and running.

6.3.2.2 OOP TS components customization and integration tasks

Table 102: OOP TS components tasks Romania

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DR-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DR-1-A	Deploy and configure DE4A connector	ONRC	Availability of working DE4A connector from WP5 lab.
		DBA-DR-1-B	Connect to central SMP and populate SMP/DNS.	ONRC	Availability of central SMP for DE4A / DBA.
		DBA-DR-1-C	Populate ESL configuration file.	ONRC	Availability of configuration file from WP3 / WP5.
DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.	DBA-DR-2-A	Connect to eDelivery AS4 gateways of data transferors (including testing interoperability).	ONRC	Availability of AS4 gateways of pilot partner Member States and resources.

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DT-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DT-1-A	see DBA-DR-1	ONRC	
DBA-DT-2	Connect to eDelivery AS4 gateways of data requestors.	DBA-DT-2-A	See DBA-DR-2	ONRC	
DBA-TR-1	Acquire required (PKI) certificates	DBA-TR-1-A	Acquire required (PKI) certificates: create CSR's, receive certificates, configure certificates	ONRC	Availability of DE4A PKI infrastructure and support team.

6.3.2.3 eProcedure portal specific tasks

Table 103: eProcedure tasks Romania

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DE-1	Adapt the eProcedure portal for piloting with eIDAS: - Optionally set up a pilot portal (real data, real users) - Add eIDAS login option for users - Show the user that he/she has successfully logged authenticated on behalf of the company	DBA-DE-1-A	Set up a pilot portal	ONRC	Availability of eIDAS dedicated node (SEMPER).
		DBA-DE-1-B	Add eIDAS login for users		
		DBA-DE-1-C	Show the user that he/she has successfully logged authenticated on behalf of the company		
DBA-DE-2	Connect the eProcedure portal to eIDAS	DBA-DE-2-A	Implement authentication option for DE4A-pilot, including request for powers validation	ONRC	Availability of eIDAS dedicated node (SEMPER).
DBA-DE-3	Connect the eProcedure portal to OOP TS	DBA-DE-3-A	ONRC portal: RO invoke DE4A connector	ONRC	Availability of DE4A connector (mock-up first).

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DE-4	Implement SDG functionality in eProcedure portal	DBA-DE-4-A	ONRC portal: Support explicit request flow with own software that implements the requirements on explicit request.	ONRC	
		DBA-DE-4-B	ONRC portal: Support presenting evidence status (success or failed)	ONRC	
		DBA-DE-4-C	ONRC portal: Add evidence preview	ONRC	

6.3.2.4 Data service specific tasks

Table 104: Data Service tasks Romania

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DO-1	Adapt the data service for providing the canonical company data evidence	DBA-DO-1-A	Extend InfoSpecApi to include a new operation that provides the canonical company data evidence.	ONRC	
DBA-DO-2	Connect the data service to the national OOP TS implementation (DE4A connector) to receive an evidence request and send the evidence	DBA-DO-1-B	- Configure DE4A Connector to interact with InfoSpecApi for receiving the request and sending the evidence or - Creating a new interface that will connect DE4A Connector with InfoSpecApi for receiving the request and sending the evidence	ONRC	Availability of DE4A connector (at least mock-up version).

6.3.3 Planning

Activity		Task id	MS specific task	Change owner	Effort	jan	feb	mrc	apr	may	jun	jul	aug	sep	oct	nov	dec
eIDAS components customization and integration tasks																	
DBA-AC-1	Deploy and configure dedicated eIDAS connector									eIDAS Milestone 1 - eIDAS for natural persons up and running							
DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States																
DBA-AP-1	Deploy and configure dedicated eIDAS proxy																
DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States																
DBA-AP-3	Integrate national Identity Provider(s) to the national eIDAS proxy																
DBA-AP-4	Extend eIDAS: integrate Attribute provider for legal person attributes											eIDAS Milestone 2 - eIDAS for legal persons up and running and available in eProced					
DBA-AP-5	Extend eIDAS: Integrate Mandate management System including logic to validate full powers.														eIDAS Milestone 3 - powers validation imp		
OOP TS components customization and integration tasks																	
DBA-DR-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.									Milestone 2 - "Hello Europe" between two connected member states							
												Milestone 3 - full scale cross border communication for all member states					
DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.									Milestone 2 - "Hello Europe" between two connected member states							
												Milestone 3 - full scale cross border communication for all member states					
DBA-DT-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.									Milestone 2 - "Hello Europe" between two connected member states							
												Milestone 3 - full scale cross border communication for all member states					
DBA-DT-2	Connect to eDelivery AS4 gateways of data requestors.									Milestone 2 - "Hello Europe" between two connected member states							
												Milestone 3 - full scale cross border communication for all member states					
DBA-TR-1	Acquire required (PKI) certificates									Milestone 2 - "Hello Europe" between two connected member states							
eProcedure portal specific tasks																	
DBA-DE-1	Adapt the eProcedure portal for piloting with eIDAS:											eIDAS Milestone 2 - eIDAS for legal persons up and running and integrated in eProce					
DBA-DE-2	Connect the eProcedure portal to eIDAS											eIDAS Milestone 2 - eIDAS for legal persons up and running and integrated in eProce					
DBA-DE-3	Connect the eProcedure portal to national OOP TS implementation (DE4A connector) to request an evidence and to receive the evidence.											Milestone 3 - full scale cross border communication for all member states					
DBA-DE-4	Implement SDG functionality in eProcedure portal:														Milestone 4 - ready to start pilot		
Data service specific tasks																	
DBA-DO-1	Adapt the data service for providing the canonical company data evidence: -Retrieve company data											Milestone 3 - full scale cross border communication for all member states					
DBA-DO-2	Connect the data service to the national OOP TS implementation (DE4A connector) to receive an evidence request and send the evidence:																

Figure 19: Planning (III)

6.3.4 Specific risks

Next to the common pilot risks as described in First iteration risks, some additional risks were identified on a National level. To estimate the severeness of the risk, the following matrix is used:

Table 105: Risk classification

Chance of risk occurring	Impact when risk occurs		
	Low	**Medium**	**High**
High	Medium	High	High
Medium	Low	Medium	High
Low	Low	Low	Medium

For risks in the orange and red category measures are defined. These risks will be actively monitored.

Table 106: Risk Analysis Romania

ID	Risk description	Measures	Impact	Chance	Risk
ROR1	eIDAS node not available due to lack of support and resources	Collaborate with other Member State involved in the project who have better expertise and can offer support	High	Medium	High
ROR2	RO DC available with delay due to lack of resources		Medium	Medium	Medium
	RO DP available with delay due to lack of resources		Medium	Medium	Medium
ROR3	eService released without Tax Agency involvement (simulated fiscal code)		Low	Medium	Low
ROR4	eService not allowing to register real new branches due to legal restrictions		Low	High	Medium

6.4 Sweden

The Swedish companies Registration Office (Bolagsverket registers companies and associations and makes annual reports official. At the website there is functions which allows a user to search for and buy business information from the registers.

The objective is to make a business start-up quick, easy and correct. For this purpose, there is information and eServices. At the website verksamt.se a user can for example read about starting and running a business, find an adviser and register a business. The information in the eServices is for the

time being in Swedish. The overall information about the procedures is in English according to the Single Digital Gateway Regulation. Bolagsverket's activities are not financed by public funding. There is a charge for products and services.

Bolagsverket is one of the lead agencies in development of Swedish E-governmental infrastructure. Bolagsverket has a long history of developing eServices, advanced back end systems and national infrastructure. The Agency operates the platform for the Swedish point of single contact Verksamt.se. Bolagsverket operates and owns the Business registration process. The Agency has also, for a long period, been cooperating with their Norwegian and Danish sister organisations Brönnöysundsregistrene and Erhvervsstyrelsen. The Agency is also responsible for the technical operations of Verksamt.se and provides both management and technical know-how in these activities. Furthermore Bolagsverket holds the Swedish "Once Only Layer" that provides business data nationally. The Layer also contains the Swedish TOOP connector testbed, which in this particular project can be an important factor for successful pilots. The Agency was earlier also a part of the Swedish consortia for the large-scale pilot eSENS. Bolagsverket is also active in other major EU initiatives such as BRIS (Business Register Interconnection System) and Insolvency Registers.

The Swedish e-government authority DIGG is newly established and has the task of coordinating digital government at both national and EU level. Digg is therefore also the Swedish coordinator for the integration to SDGR and has responsibility for the Swedish eIDAS nodes.

6.4.1 Specific design decisions

The pilot follows the major design decisions as specified in section 3.3. The following Member State specific design choices have been made:

1. A basic e-Portal will be set up for the pilot. A parallel project is currently running in SE where a new digital service for starting branches is under development, therefore the pilot will not set up a production ready service.
2. A separate connector and gateway (Holodeck) will be used.
3. Only test data will be used in the pilot.

6.4.2 Specific tasks

The tables below show the Member State specific tasks that the Member State has to do in order to overcome the gaps that have been identified (refer to detailed design documents). To each task a unique id has been assigned.

6.4.2.1 eIDAS components customization and integration tasks

Table 107: eIDAS components tasks Sweden

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-AC-1	Deploy and configure dedicated eIDAS connector	DBA-AC-1-A	Develop, deploy and configure new connector	DIGG	
DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States	DBA-AC-2-A	Connect to Member State as they become available	DIGG	Proxies ready in MS
DBA-AP-1	Deploy and configure dedicated eIDAS proxy	DBA-AP-1-A	Develop, deploy and configure new proxy	DIGG	

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States	DBA-AP-2-A	Connect	DIGG	Connectors ready in MS
DBA-AP-3	Integrate national Identity Provider(s) to the national eIDAS proxy	DBA-AP-3-A	Connect Freja and/or BankId	DIGG	
DBA-AP-4	Extend eIDAS: Integrate Attribute provide	DBA-AP-4-A	Set up ATP service	BOL	
		DBA-AP-4-B	Connect to ATP	DIGG	
DBA-AP-5	Integrate mandate management system / attribute provider(s), including logic to validate full powers.	DBA-AP-5-A	Implement mandate service logic	BOL	

6.4.2.2 eProcedure portal specific tasks

Table 108: OOP TS components tasks Sweden

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DE-1	Adapt the eProcedure portal for piloting with eIDAS: - Optionally set up a pilot portal (real data, real users) - Add eIDAS login option for users - Show the user that he/she has successfully logged authenticated on behalf of the company	DBA-DE-1-A	Develop ePortal	BOL	
DBA-DE-2	Connect the eProcedure portal to eIDAS	DBA-DE-2-A	Connect	BOL	
DBA-DE-3	Connect the eProcedure portal to OOP TS	DBA-DE-3-A	Develop and deploy Format Converter	BOL	
		DBA-DE-3-B	Connect Format Convertor to SSBT service	BOL	
		DBA-DE-3-C	Develop and deploy connector proxy	BOL	

		DBA-DE-3-D	Connect SSBT to proxy	BOL	
		DBA-DE-3-E	Connect proxy to connector	BOL	
DBA-DE-4	Implement SDG functionality in eProcedure portal	DBA-DE-4-A	Implement login functionality	BOL	
		DBA-DE-4-B	Implement evidence request functionality	BOL	
		DBA-DE-4-C	Implement preview functionality – show information in form	BOL	
		DBA-DE-4-D	Implement Create branch button	BOL	

6.4.2.3 OOP TS components customization and integration tasks

Table 109: eProcedure tasks Sweden

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DR-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DR-1-A	Deploy and configure DE4A connector	BOL	Availability of component
		DBA-DR-1-B	Deploy and configure gateway	BOL	Availability of component
		DBA-DR-1-C	Connect to central SMP and populate SMP/DNS.	BOL	Availability of component
		DBA-DR-1-D	Populate ESL configuration file.	BOL	Availability of configuration file from WP3 / WP5.
DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.	DBA-DR-2-A	Connect to gateways or other MS	BOL	Availability of AS4 gateways of pilot partner Member States and resources.
DBA-DT-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DT-1-A	see DBA-DR-1	BOL	

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DT-2	Connect to eDelivery AS4 gateways of data requestors.	DBA-DT-2-A	See DBA-DR-2	BOL	
DBA-TR-1	Acquire required (PKI) certificates	DBA-TR-1-A	Acquire required (PKI) certificates: create CSR's, receive certificates, configure certificates	BOL	Availability of DE4A PKI infrastructure and support team.

6.4.2.4 Data service specific tasks

Table 110: Data Service tasks Sweden

Activity id	Activity	Task id	Task	Change owner	Pre-condition
DBA-DO-1	Adapt the data service for providing the canonical company data evidence	DBA-DO-1-A	Develop and deploy service to request data from existing services and map to canonical format.	BOL	
		DA-DO-1-B	Develop and deploy proxy for data service	BOL	
		DA-DO-1-C	Connect proxy to data service	BOL	
DBA-DO-2	Connect the data service to the national OOP TS implementation (DE4A connector) to receive an evidence request and send the evidence	DBA-DO-2-A	Connect gateway to proxy service	BOL	See DBA-DT-1

6.4.3 Planning

Activity		Task Id	MS specific task	Change Owner	Effort	feb	mrc	apr	may	jun	jul	aug	sep	oct	nov	dec
eIDAS components customization and integration tasks																
DBA-AC-1	Deploy and configure dedicated eIDAS connector	DBA-AC-1-A	Develop, deploy and configure new connector	DIGG												
DBA-AC-2	Connect to eIDAS proxies of piloting partners' Member States	DBA-AC-2-A	Connect to MS as they become available	DIGG												
DBA-AP-1	Deploy and configure dedicated eIDAS proxy	DBA-AP-1-A	Develop, deploy and configure new proxy	DIGG												
DBA-AP-2	Connect to eIDAS connectors of piloting partners' Member States	DBA-AP-2-A	Connect	DIGG												
DBA-AP-3	Integrate national Identity Provider(s) to the national eIDAS proxy	DBA-AP-3-A	Connect Freja and/or BankId	DIGG												
DBA-AP-4	Extend eIDAS: Integrate Attribute provider	DBA-AP-4-A	Set up ATP service	BOL												
		DBA-AP-4-B	Connect to ATP	DIGG												
DBA-AP-5	Integrate mandate management system / attribute provider(s), including logic to validate full powers.	DBA-AP-5-A	Implement mandate service logic	BOL												
eProcedure portal specific tasks																
DBA-DE-1	Adapt the eProcedure portal for piloting with eIDAS:	DBA-DE-1-A	Develop ePortal	BOL												
DBA-DE-2	Connect the eProcedure portal to eIDAS	DBA-DE-2-A	Connect	BOL												
DBA-DE-3	Connect the eProcedure portal to OOP TS	DBA-DE-3-A	Develop and deploy Format Converter	BOL												
		DBA-DE-3-B	Connect Format Convertor to SSBT service	BOL												
		DBA-DE-3-C	Develop and deploy connector proxy	BOL												
		DBA-DE-3-D	Connect SSBT to proxy	BOL												
		DBA-DE-3-E	Connect proxy to connector	BOL												
DBA-DE-4	Implement SDG functionality in eProcedure portal	DBA-DE-4-A	Implement login functionality	BOL												
		DBA-DE-4-B	Implement evidence request functionality	BOL												
		DBA-DE-4-C	Implement preview functionality – show information in form	BOL												
		DBA-DE-4-D	Implement Create branch button	BOL												
OOP TS components customization and integration tasks																
DBA-DR-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DR-1-A	Deploy and configure DE4A connector	BOL												
		DBA-DR-1-B	Deploy and configure gateway	BOL												
		DBA-DR-1-C	Connect to central SMP and populate SMP/DNS.	BOL												
		DBA-DR-1-D	Populate ESL configuration file.	BOL												
DBA-DR-2	Connect to eDelivery AS4 gateways of data transferors.	DBA-DR-2-A	Connect to gateways og other MS	BOL												
DBA-DT-1	Deploy and configure OOP TS common components: DE4A connector, eDelivery AS4 gateway and SMP. Configure DNS & SML. Populate ESL configuration file.	DBA-DT-1-A	see DBA-DR-1	BOL												
DBA-DT-2	Connect to eDelivery AS4 gateways of data requestors.	DBA-DT-2-A	See DBA-DR-2	BOL												
DBA-TR-1	Acquire required (PKI) certificates	DBA-TR-1-A	Acquire required (PKI) certificates: create CSR's, receive certificates, configure certificates	BOL												
Data service specific tasks																
DBA-DO-1	Adapt the data service for providing the canonical company data evidence	DBA-DO-1-A	Develop and deploy service to request data from existing services and map to canonical format.	BOL												
		DA-DO-1-B	Develop and deploy proxy for data service	BOL												
		DA-DO-1-C	Connect proxy to data service	BOL												
DBA-DO-2	Connect the data service to the national OOP TS implementation (DE4A connector) to receive an evidence request and send the evidence	DBA-DO-2-A	Connect gateway to proxy service	BOL												

Figure 20: Planning (IV)

6.4.4 Specific risks

Next to the common pilot risks as described in First iteration risks, some additional risks were identified on a National level. To estimate the severeness of the risk, the following matrix is used:

Table 111: Risk classification

Chance of risk occurring	Impact when risk occurs		
	Low	**Medium**	**High**
High	Medium	High	High
Medium	Low	Medium	High
Low	Low	Low	Medium

For risks in the orange and red category measures are defined. These risks will be actively monitored.

Table 112: Risk Analysis Sweden

ID	Description	Measures	Impact	Chance	Risk
SER1	Risk that DIGG does not have the time to help us with the eIDAS node within the timeframe that we envision for the DE4A project (concerns activities DBA-AC-1, DBA-AC-2, DBA-AP-1, DBA-AP-2, DBA-AP-3, DBA-AP-4)	Check alternative possibilities for other eIDAS nodes within Sweden.	High	Medium	Medium
SER2	Risk that we will not be able to use production data even further in the project	A new legal analysis or change the scope of the pilot for Sweden.	High	High	Medium
SER3	Risk that the priority for the DE4A pilot decreases for BOL since there is no obvious connection and sync between the pilot and TOOP/SDG	Take up the question with the PM of DE4A	High	Medium	High

7 Running phase management plan

7.1 Go-live Launching Criteria

In the table below the pilot-scenarios that will be executed in first DBA pilot iteration are listed, including the risk category of the scenario (High, Medium or Low, see section 7.6 for a detailed description of the categories).

Table 113: Overview first iteration pilot-scenarios

DE Member State	DO Member State			
	*AT***	*NL*	*SE **	*RO*
AT (USP.gv.at)	-	DBA1_AT-NL (H)	-	DBA1_AT-RO (H)
NL (MijnRVO.nl)	DBA4_NL-AT (H)	-	-	DBA4_NL-RO (H)
*SE (Verksamt.se) **	DBA5_SE-AT (M)	DBA5_SE-NL (M)	-	DBA5_SE-RO (M)
*RO (portal.onrc.ro) **	DBA6_RO-AT (M)	DBA6_RO-NL (M)	DBA6_RO-SE (L)	-

* Simulated eProcedure
** Fictitious data

Note that not all pilot-scenarios are fully executed in a production environment. This affects the go-live criteria for those scenarios.

The exact set of pilot-scenarios for the second DBA pilot iteration (2022) has yet to be determined but in both iterations the same go-live criteria will apply.

The DBA pilot does not require all pilot-scenarios to go-live at the same time. In order to run a specific pilot-scenario, e.g. 'DBA4_NL-AT' the data-evaluator and data-requestor from the data-consumer Member State (NL in this example) and the data-owner and data-transferor of the data-provider Member State (AT in this example) need to be live.

The criteria for go-live of a pilot-scenario are listed below. All criteria are mandatory unless stated otherwise:

1. The data-consumer Member State has concluded the functional tests of the national eIDAS and OOP TS components as described in section 4.3 and has solved all blocking issues.
2. The data-providing Member State has concluded the functional tests of the national eIDAS and OOP TS components as described in section 4.3 and has solved all blocking issues.
3. The data-consumer Member State and the data-provider Member State have concluded the joint integration test and end-to-end test as described in section 4.3 and have solved all blocking issues.
4. In case of a low-risk pilot scenario: the participating organisations have affirmed their mutual understanding that low-risk piloting implies no specific constraints or obligations on any side (as described in section 7.6).
5. In case of a medium or high-risk pilot-scenario: the participating data-consumer Member State and data-provider Member State have legally agreed to run the pilot-scenario, by means of a memorandum of understanding or another form of agreement and have taken measures as described in section 7.6.

6. When piloting with real data: the users and companies (see section 0) that participate in the pilot, at least one real company per data provider Member State, are available and informed and they agreed upon participating in the pilot-scenario.
7. Should-have: Measurements to collect data on proving that the DE4A DBA pilot objective and goals are met, as described in section 4.3.1 and section 2.1.2, are in place. Reference measurements (to compare the pilot results to) have been established.
8. Should-have: The micro-website for collecting the feedback of involved users, as described in section 4.3.7, is ready.

7.2 Running phase activities

7.2.1 Activities

In the pilot running phase (in the first as well as in the second pilot iteration) the following activities are carried out:

1. Prepare pilot-scenario:
   The member states that participate in the specific pilot scenario prepare all necessary measurements according the risk classification of that pilot-scenario.
2. Plan pilot runs details:
   The pilot-leader plans the pilot runs in detail together with the pilot scenario participants, and the planned timeboxes for the pilot-runs are scheduled in the agendas of the participants.
3. Check go-live pilot scenarios:
   The pilot-leader checks if pilot-scenarios fulfil the go live criteria.
4. Execute pilot-runs:
   The member states execute the pilot runs according the planning and the way-of-work as described in section 7.2.2.
5. Coordination and reporting:
   The pilot-leader documents the execution of the pilot-runs and reports to the product owner and program management.

7.2.2 Way-of-work of the pilot-runs

In the running phase the pilot scenarios are executed separately but the executions follow the same structure. The pilot scenarios will be executed during a joint 'pilot-run session': a timebox (approx. 4 hours) where the pilot run is performed by the Member States involved in the pilot-scenario, with their technical staff stand-by to resolve any issues, and in presence of the pilot-lead and WP5 (to assist in the troubleshooting).

The 'pilot-run sessions' consist of the following activities:

- Prepare:
  - Final check before pilot-run: all components are up and running, eID and mandates of user(s) in order
- Perform:
  - Controlled execution of the pilot-scenario
  - Collect evidence of pilot-run
    - Recording and screenshots
    - eIDAS-request and response from SAML-trace or logfiles (decrypted)
    - OOP TS request and response from logfiles (decrypted)
  - Collect user feedback (forms and interviews)
- Conclude:

- If pilot-run was completed:
  - Document pilot-run and archive evidence
  - Evaluate goals (as described in chapter 2)
- If pilot-run was not completed:
  - Document actions to be taken to resolve issues
  - Plan date to repeat pilot-run

7.3 Running phase milestones

During the running phase each pilot scenario will have its own execution planning. To align these pilot runs, taking into account the realisation of the concluding running phase report, overall milestones are defined.
The main milestones for the first pilot iteration are:

Table 114: Milestones first pilot iteration (initial running phase)

#	Milestone	Date
1	All pilot scenarios live: all of the pilot-scenarios to run are live and ready to run.	01-10-2021
2	All pilot scenarios completely executed: all of the pilot-scenarios to run have been executed completely, all evidence is collected, and the goals are evaluated.	01-01-2022
3	Running phase report (D4.7) delivered: the report of the results and conclusions to the first running phase of the pilot is ready for submission.	31-01-2022

The main milestones for the second pilot iteration are:

Table 115: Milestones second pilot iteration (final running phase

#	Milestone	Date
1	All pilot scenarios live: all of the pilot-scenarios to run are live and ready to run.	01-05-2022
2	All pilot scenarios completely executed: all of the pilot-scenarios to run have been executed completely, all evidence is collected and the goals are evaluated.	01-08-2022
3	Running phase report (D4.8) delivered: the report of the results and conclusions to the second running phase of the pilot is ready for submission.	31-09-2022

)

7.4 Running phase planning

Though the execution is performed in an Agile manner the following base planning is used as a guideline for activities of the first pilot iteration:

Table 116: Planning first pilot iteration (initial running phase)

Activity	Sept '21	Oct '21	Nov '21	Dec '21	Jan '22
1. Prepare pilot-scenarios					
2. Plan pilot runs details					
3. Check go-live pilot scenarios					
4. Execute pilot-runs					
5. Coordination and reporting					
6. Deliver report of running phase (D4.7)					

Though the execution is performed in an Agile manner and therefore not all details of the second pilot iteration are known, the following base planning is used as a guideline for activities of the second pilot iteration:

Table 117: Planning second pilot iteration (final running phase)

Activity	Apr '22	May '22	June '22	July '22	Aug '22	Sept '22
1. Prepare pilot-scenarios						
2. Plan pilot runs details						
3. Check go-live pilot scenarios						
4. Execute pilot-runs						
5. Coordination and reporting						
6. Deliver report of running phase (D4.8)						

7.5 Governance structure

This subsection outlines the scope of DE4A pilots' governance, providing an overview on its objectives, involved parties, responsibilities, and mechanisms to manage different situations that may arise during piloting.

Since the governance of all pilots during the execution will be under the common entities mentioned below, this section in each pilot planning deliverable will be the same. While this creates duplication in the content of the deliverables, it also ensures that the documents can be read and understood as stand-alone deliverable.

The Governance of the DE4A Pilots in production environment aims to fulfil the following main objectives:

Continuous supervision of pilot activities to ensure the execution of the pilots is aligned with project target outcomes and expected impacts. To achieve this the prompt reaction to any issue is necessary and advisory support to the follow-up of preventive measures. This monitoring will facilitate the fulfilment of the **Executive Board** duties which have to be periodically reported to the decision bodies of the project (i.e. MS-Council).

Adequate and timely management of either those situations common to the three pilots requiring a common direction across them and/or situations which require escalation to higher management levels and/or coordination from Technical Working Group i.e. they could have a project-wide impact.

Integrated reporting to the management workpackage (WP9) and DE4A management and decision bodies including the Project Coordinator and the Member State Council.

In addition to existing governance bodies in the project, a new one will be designated, called **Pilot Supervisory Team (PST)**, as an operational entity that aims to provide effective coordination within the existing pilot management level. The scope and responsibilities of the PST are is limited to the duration of the pilots.

This Pilot Supervisory Team, will include the Pilot Leader and one Representative from each of the MS partners involved in the pilot (when there are multiple partners representing the different eProcedure portals and data services). This representative will be an appointed leader from the MS that can act as main contact point for coordinating different responsibilities of the participant in the pilot when different agencies are involved. The Pilot leader will also ensure that other partners in the pilot who do not belong to the PST are informed of any major decisions which affect them and MS representative will ensure national internal coordination for needed activities at MS level in the pilot.

It is recommended also to have special internal groups on each pilot where experts are identified with support from all partners by the Pilot Leader to focus on and support to help resolve specific matters/challenges as they arise. Such groups can be agreed upon by the Pilot Supervisory Team and convened on demand during the different phases of the pilot. It is worth to mention these specialized teams are generally of a technical nature and supportive to the overall governance.

This proposed DE4A Pilots Governance structure is shown in the following figure:

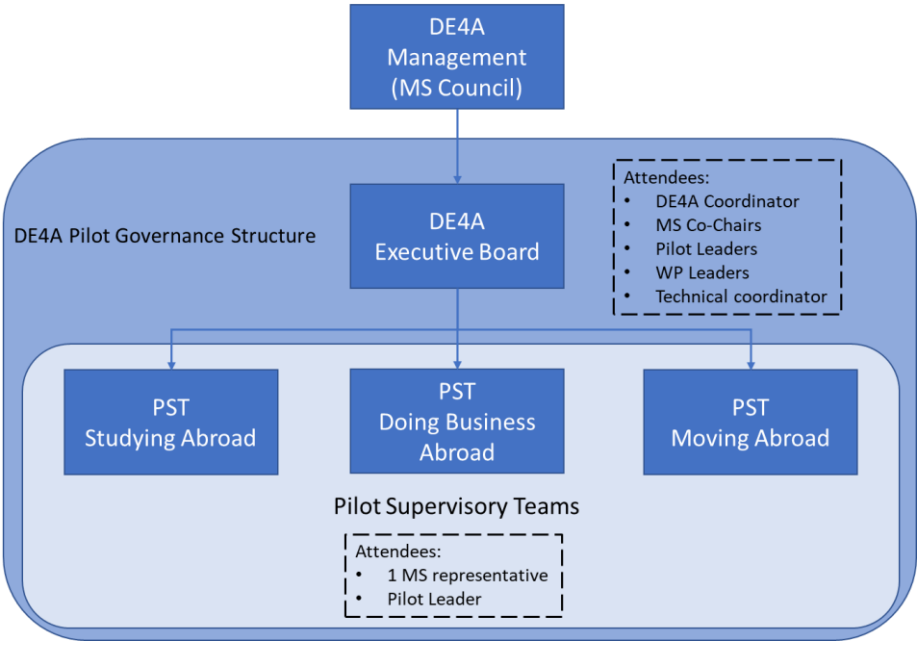


Figure 21: DE4A Pilots Governance structure

The goal of this governance entity (PST) is to discuss situations that are related to the online cross-border services and the execution activities performed within the pilot. The PST meetings can be the

current regular pilot meetings where all pilot partners are participating. The PST will be chaired by the Pilot Leader and it will have periodic conference calls with high frequency in the first weeks after pilot launch. The PST can decide to modify this frequency later as it is confirmed that the pilot runs in a sufficiently stable way.

In such meetings, internal decisions can be taken on the pilot, continuously assessing the running of the pilot online services and on-going activities of the running phase and agree the problems that need to be raised to the DE4A Executive Board. When needed, important stakeholders for the pilot such as other WP leaders or Technical Coordinator, can be invited to participate actively on PST meetings.

Any significant operational issue will be duly reported to the Executive Board without significant delay.

Hierarchical management of issues determines that at pilot level it is possible to manage the following types of problems:

1. Technical and non-technical internal pilot running problems of non-critical nature,
2. Technical internal pilot problems unique to one MS,
3. Problems related to support to pilot users
4. Pilot marketing and awareness activities.

When necessary, the Pilot Leader can take advantage of General Assemblies for discussing any situation that can affect the pilot running phase and it could be replicated in other pilots, to share the lessons learned during the execution.

The Pilot Leader can submit to the Executive Board, any requests or issues for guidance on pilot management-related issues during the running phase of the pilot.

Unexpected urgent matters related to the pilot execution can be escalated offline to the Executive Board, upon prior consultation with the DE4A Pilots Coordinator. Conversely, the PST will provide feedback to the Executive Board when this is requested by such body and this response will be coordinated by the Pilot Leader attending to its urgency and ensuring its clarity.

In terms of pilot governance, the Executive Board, as one of the supervisory body for execution of the Project, will support the management of the operational activities during the live running of the pilot as a decision making body guided by the information provided by the PST (represented by the Pilot Leader).

The Executive Board will share with the PST the responsibility of governing the running phase of the pilots (including an effective implementation of decisions by the MS Council). It will provide advice supporting issue resolution based on feedback provided by the Pilot Leader on behalf of the PST. It can indicate to the PST what would need to be done, although operational decisions on how to achieve these objectives or actions will be made at PST level (and if and when necessary, discussed with the Executive Board of which Pilot Leaders are also members).

The Executive Board will focus on those problems that are common to all the pilots or any relevant issues related to running phase activities that require support beyond pilot level management. Where appropriate, the Board could include in their recommendations advice on how the required actions could be carried out, but the final decisions on how they should be implemented remain the responsibility of the PST.

Examples of problems that would be managed at the level of the Executive Board can include:

1. Technical and non-technical problems which, affecting one particular pilot, cannot be solved at PST level,
2. Technical problems common to more than one pilot which have external causes,

3. Problems unique to one MS which have an external cause and non-technical pilot problems common to more than one MS which have external causes,
4. Major security incidents which have cross-border impact (crisis management procedures would apply).

The Executive Board is chaired by Project Coordinator (ATOS) and the conference call is every two weeks. Minutes are being produced after every teleconference and the MS-Council can be informed or asked for support for especially critical issues as well based Executive Board conclusions when needed.

7.6 Identified risks during running phase

7.6.1 Low risk pilot-runs

A pilot run with a simulated eProcedure and fictitious data is a pilot run with low risk. Before the start of these pilot-runs the participating Member States need to have affirmed their mutual understanding that low risk piloting implies no specific constraints or obligations on any side. This is one of the go-live criteria and will be checked before starting the pilot-runs.

7.6.2 Medium risk pilot-runs

A pilot run with a simulated eProcedure but with real person and / or company data is a pilot run with a medium risk. Note that pilots with real eProcedures but with fictitious data are not part of the DBA pilot. A medium risk pilot requires the following measures:

a) Inform the users involved, as acting natural persons representing the participating legal persons, of the fact that they are involved in piloting activities, including the identification of any risks and countermeasures taken, and the (lack of) legal effects and consequences of participation. The communication should be done in their own language, in an accessible manner, and providing usable contact information. If the GDPR applies, such information provision should satisfy the requirements of the GDPR. Appropriate documentation should be retained to demonstrate that this information has been provided.
b) If the piloting involves real-life persons, piloting should be organised under the supervision of a DPO.
c) All pilot partners should notify any operators of production components in their respective countries in advance, and appropriate measures should be taken that piloting activities do not result in negative legal or practical consequences for any real-life persons, real life data, or production environments.
d) The production environments should be cleaned afterwards as needed to ensure that no long term negative legal or practical consequences can occur for any real-life persons, real life data, or production environments, even after project termination.
e) All piloting activities should be monitored by pilot partners (each solely in relation to such components of the piloting activities which are under their responsibility) in a manner that allows any incidents to be detected and remedied (including by contacting any affected real-life persons where needed).

Before the start of these pilot-runs the participating Member States need to have affirmed their mutual understanding that medium risk piloting implies these constraints and obligations on any side and that they have taken measures accordingly. This is one of the go-live criteria and will be checked before starting the runs.

7.6.3 High risk pilot-runs

A pilot run with a real eProcedure and with real person and company data is a pilot run with a high risk. A high risk pilot requires the following measures:

a) All measures that apply to medium risk piloting as set out in section 7.6.2. Except for requirement ‘d) cleaning of the production components’; this is not applicable if the intention of the pilot run is to really apply for a service.
b) The DE4A project DPO should be informed prior to initiating piloting activity, and of any incidents that are reasonably likely to create legal effects or practical impacts on any real-life persons.
c) The implementation of a pilot monitoring and remediation strategy covering all participating countries, to assess whether exchanged evidences are reasonably capable of satisfying the legal, technical and operational requirements for high risk piloting, including in terms of data quality, and to ensure that any errors in the piloting activity can be detected and remediated in a manner that eliminates any negative legal or practical consequences for any real-life persons, real life data, or production environments.

Before the start of these pilot-runs the participating Member States need to have affirmed their mutual understanding that high risk piloting implies these constraints and obligations on any side and that they have taken measures accordingly. This is one of the go-live criteria and will be checked before starting the pilot-runs.

8 Conclusion

The previous DBA deliverable (D4.5) proved to be a very good foundation for further pilot preparatory activities. Based on that deliverable and the identified fundamental topics included, important working assumptions were formulated and decisions were made after thorough analysis (section 3.3). Also, the DBA solution architecture (Annex 1 – Solution architecture) and more detailed pilot processes were defined, providing detailed information on how each partner will involve (and adapt) their national infrastructure to support the pilot iterations.

DBA partners collaborated with work package 3 to establish a Company Evidence model (section 3.5), defining the data to be exchanged by the OOP TS. This data model is supported by all partners and by WP3, after detailed examination of the requirements of all Data Evaluators as well as the availability of data in business registers of participating DBA Member States.

DBA partners will develop solutions in four domains: eIDAS, OOP TS Common Components, eProcedure and Data Service. To secure a managed development and testing process towards the start of the pilot, the main activities (Pilot implementation activities) and major milestones (Customization and integration pilot management plan) have been identified, as have the dependencies to other work packages in the DE4A project. These milestones are the foundation for the pilot planning (section MS customization & integration management plan) of each Member State participating in the Doing Business Abroad pilot and provide a solid basis for managing local development activities.

Last but not least, D4.6 provides a detailed view on the pilot iteration itself (Running phase management plan). Not only on the way the pilot will be organized in activities, risk management and governance, but also on which user groups will be involved and how they will be invited to join the pilot (section 0). Also, D4.6 provides much more detail on the way the pilot will result in the data needed to evaluate the extent to which pilot goals have been met (Pilot benefits logic and metrics).

All of the above required professional and intensive collaboration of the DBA partners as well as the other work packages (2, 3, 5, 6, 7) and the project management in the DE4A project. The results are well substantiated, extensive and detailed, making deliverable D4.6 to be a significant next step towards the start of the first pilot iteration.

References

[1] EC Regulation 2016/1191

[2] DE4A D4.5 Business Abroad Use Case Definition and Requirements v1.0_Final

[3] DE4A D2.4 Project Start Architecture - v2.0

[4] eIDAS SAML attribute profile v1.1: https://ec.europa.eu/cefdigital/wiki/download/attachments/82773108/eIDAS%20SAML%20Attribute%20Profile%20v1.1_2.pdf?version=3&modificationDate=1528362598014&api=v2

Annex 1 – Solution architecture

January 5th, 2021

1.1 Introduction

This document presents the solution architecture for the DBA pilot. It has been constructed in close cooperation with WP2 to ensure full alignment to the DE4A architecture. Its purpose is to guide the design and development of (adaptions to) required components by the pilot participants and to assist the ongoing cooperation and alignment with WP3 for semantics and WP5 for software components.

The solution architecture presented in this document is guided by several aspects of previous work, like D4.5[33] and the discussion papers on several topics of relevance to the DBA pilot. This previous work defines scope, working assumptions, preconditions, areas of interest, design choices etc. Not all of these have been copied into this document. This chapter highlights only the most important ones, without pretending to be complete. The project has elaborated internal documents on each topic as the groundwork for this document.

This document specifies the DBA solution architecture. Its purpose is to assist the design of the software architecture and development and configuration of the components needed:

- By WP5 for the common components.
- By the DC's for their specific application services, like the eProcedure portal and connection to the OOP TS and eIDAS.
- By the DP's for their specific application services, like the data services and connection to the OOP TS and eIDAS.

1.1.1 Scope and focus

The scope of this architecture is limited to the minimum viable product (MVP) that has been defined by the partners of the DBA pilot.

First pilot iteration:

- minimum viable functionality for the intermediation pattern (UC1)

Second pilot iteration:

- extended functionality for the intermediation pattern (UC1)
- subscription & notification pattern (UC2)
- lookup pattern (UC2)

The second pilot iteration is out of scope of this version of the solution architecture. Furthermore:

1. The MVP implements the smallest possible functionality needed to run the DBA pilots for the first use case (starting a business abroad). All components that do not directly contribute to the MVP are out of scope for this architecture.
2. This solution architecture applies to the intermediation pattern only. Other patterns, like the subscription & notification pattern and the lookup pattern, have not been included.
3. The priority of the DBA pilot lies in solving two challenges: (1) piloting proper exchange of company data (evidence) and (2) piloting a solution for company representation, including powers

[33] See D2.4 PSA section 4.2 on the intermediation pattern and section 7 on the DBA pilot.

validation. Other topics are relevant to the pilot as well, like the explicit request and preview functions, but they will be included in the simplest way possible.

4. The solution to implement should nevertheless be production-worthy as the goal of the DBA pilot is to pilot in production[34].
5. The MVP support validating full powers only, meaning that the DP-Member State will check whether the natural person has the powers to apply for any public service in the DC-Member State. This means integration with the national mandate management system of this Member State to check the natural person is representative of company with full powers. Having full powers will allow to apply for any public service in the DC-Member State.

1.1.2 DE4A preconditions

The DBA solution architecture implements some DE4A-wide decisions:

1. The OOP TS consists of functionality for evidence exchange as well as the information desk. DE4A uses eDelivery for implementing the evidence exchange functionality. Other options for messaging have not been considered in constructing this solution architecture.
2. DE4A uses eIDAS. Other options have not been considered in constructing this solution architecture.

1.1.3 Design choices

The DBA pilot partners made several choices in implementing the DBA pilots:

1. The DBA pilot uses the eIDAS company identification attributes to communicate the represented legal person to the DP. As most Member States do not provide these attributes currently, they need to be added for piloting.
2. The DBA pilot will use the OOP TS for retrieving the company data needed for the eProcedure.
3. The DBA pilot will use CEF's reference software for the eIDAS node version 2.4. In case of Sweden: Sweden will use their custom version of the eIDAS node that should be compatible with eIDAS attribute profile 1.1[35].
4. The DBA pilot will use the SEMPER extension that is compatible with the eIDAS node 2.4 for fine-grained powers validation in the second pilot iteration. Use of the SEMPER extension is allowed in the first pilot iteration as it should not interfere with regular use of eIDAS, but it is not required and will not be piloted in the first pilot iteration[36].
5. The DBA pilot will implement a pilot-eIDAS-network, meaning the Member States will implement dedicated pilot eIDAS nodes for cross-border authentication and powers validation that is isolated from the regular network of eIDAS nodes. As the project extends on the use of eIDAS with legal person attributes and powers validation, regular eIDAS nodes are not suitable for piloting. Furthermore, use of the dedicated eIDAS network allows for acceptance of non-notified eID for piloting only.

1.1.4 eIDAS and OOP TS

The DBA pilot implements the reference processes of DE4A's project start architecture to meet the requirement of the DBA pilot. In designing the solutions for the processes, DBA distinguishes between the:

---

34 Most pilot partners will pilot with real companies and real data on a pilot specific portal.

35 Currently, Sweden has implemented profile 1.2. It needs to be assessed whether this version of the eIDAS profile is fully backwards compatible with version 1.1.

36 Romania, The Netherlands and possibly Austria will implement the SEMPER extension from the start.

1. **DBA eIDAS solution architecture**
   The architecture for using eIDAS to authenticate the natural person, gather company identification attributes and validate powers. See chapter 1.2.
2. **DBA OOP TS solution architecture**
   The architecture for using the OOP TS for exchange of company data between the data evaluator and the data owner[37]. See chapter 1.3.

Each of the (sub) solution architectures are divided in:

a. Shared solution: the common part of the solution.
   The application services that are common to all DBA pilot use cases and scenarios. These are typically the application services that are part of the Once Only Technical System (OOP TS) and eIDAS. These common components need to be deployed and configured by each of the piloting Member State. For the OOP TS common services (eDelivery), the DBA pilot expects WP5 to select, design and develop the components needed.
b. DC-specific solution: the part of the solution the DC has to implement, including integration with the dedicated eIDAS network and the OOP TS.
c. DP-specific solution: the part of the solution the DP has to implement, including integration with the dedicated eIDAS network and the OOP TS.

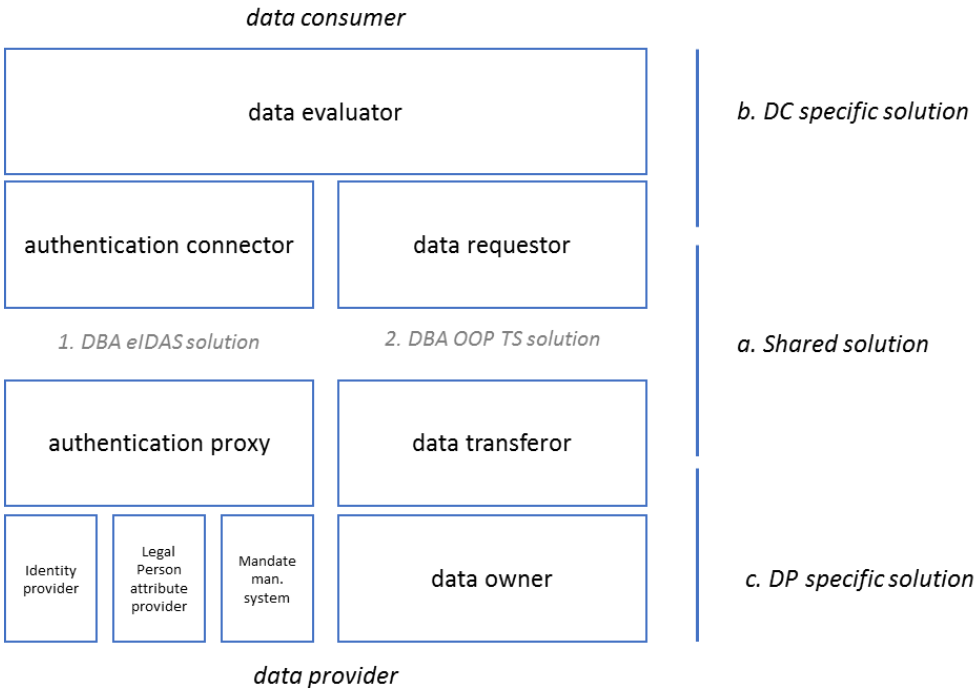


Figure 22: Solution architectures diagram

[37] Not to be confused with the SDG OOTS. DE4A produces a Technical System implementation with particularities and design and implementation choices related to the DE4A project scope.

The eIDAS network is a – from the OOP TS – separate network of eIDAS nodes and their connections. It is linked to the OOP TS via the data evaluator that coordinates the eProcedure. There is no direct interaction between the eIDAS network and the OOP TS.

1.2 DBA eIDAS solution

The roles defined in the PSA refer to the party's involvement in the exchange of evidence. For DBA, besides that also the eIDAS domain is of utmost importance. As eIDAS does not deal with evidence exchange as such, but with information on identities and powers, additional roles are involved.

The additional roles for eIDAS are:

- Authentication connector:
  the actor that – typically at a Member State level – connects to the eIDAS network as a relying party. Via the authentication connector, the data evaluator can request authentication, identifying attributes of the company and a powers validation.
- Authentication proxy:
  the actor that connects the national (notified and non-notified) eID(s), attribute provider(s) and mandate management system(s) to the eIDAS network. The authentication proxy role coordinates the authentication (and powers validation) process. In the two Member State scenario, authentication takes place in the data providing Member State as the user, its eID and the company are all from the DP Member State[38].

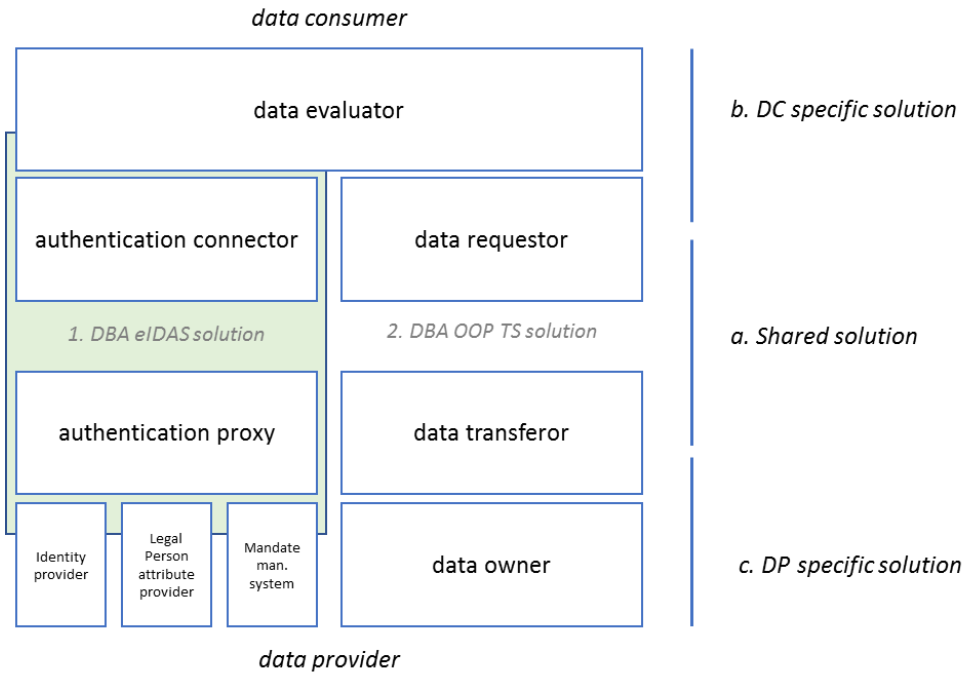


Figure 23: Solution architecture: eIDAS solution

[38] In the multiple Member State scenario's the authentication proxy can be in another Member State than the data provider is (not depicted in the figure below). The multiple Member State scenario is out of scope of the DBA pilot.

In the eIDAS domain the roles "authentication connector" and "authentication proxy" handle cross-border requests for authentication, company identification attributes ('legal person' in eIDAS) and powers validation. The authentication connector of the DC-Member State sends an authentication request to the DP-Member State. The authentication proxy coordinates all national activities (IdP, attribute provider, mandate management system) and returns the authentication result to the authentication connector.

Compared to current eIDAS practice, the use of eIDAS will be extended by the DBA pilot with:

- Requesting and sending legal person attributes (identifying the company that applies for the service). Although eIDAS has been able to send legal person attributes from the start, this functionality has been notified just twice (by IT and NL) and has not been used in production services.
- Validating powers of representation. This function is not part of the eIDAS network currently. In the first pilot iteration (MVP) the pilot partners validate full powers only. Sending natural person attributes and legal person attributes via eIDAS means the natural person may apply for any service in the DC Member State ('DBA access policy rule' – no attributes regarding the powers validation result will be transmitted, so the powers declaration will be implicit). For the second pilot iteration, fine grained powers validation will be implemented, requiring extension of the eIDAS functionality in order to express the exact powers of representation ('add powers validation attributes'). eIDAS will be extended with the SEMPER attributes for this purpose.

The project has elaborated an internal DBA discussion paper on powers validation as input to this deliverable.

The Data evaluator in the DBA pilot needs record matching on the company to determine whether the company has been registered at the company portal prior to the pilot start (without eIDASLegalPersonIdentifier)[39]. The DBA data consumer will use the second mandatory eIDAS attribute (LegalName) for that purpose. If needed the Data evaluator interacts with the user to do additional checks in the matching process. For the pilot, the pilot partners do not need an extension to eIDAS with additional legal person attributes. In any case, record matching at the data evaluator is an eProcedure portal (or data consumer) specific activity that does not need harmonisation across piloting partners.

The data owner does not need to do record matching on the company as it can use the eIDASLegalPersonIdentifier to uniquely identify the company involved. This is a consequence of the pilot principle, that the authenticating proxy sends an eIDASLegalPersonIdentifier that the business register itself uses in its company registration.

Data evaluators and data owners do not need to do record matching on the *natural person*. Therefore, no additional eIDAS attributes of the natural person are needed.

The project has elaborated an internal DBA analysis on record matching as input to this deliverable.

1.2.1 Shared solution

The shared solution consists of all common functionality that is part of the core eIDAS network. The pilot will rely on CEF eID to provide the required common components (eIDAS reference software) and

[39] This is different from the record matching in the other pilots that focus at natural person matching. Some DE's may decide to implement this function in the final pilot iteration and not in the MVP. This is currently under examination by the data evaluators. Today, BE and AT expect to do record matching on the company at run-time at the DE. NL expects to do record matching prior to the pilot (adding the eIDASLegalPersonIdentifier to all foreign companies already registered at the eProcedure portal). SE and RO expect not to implement record matching as they will start with a clean sheet (empty company registry for piloting purposes).

the underlying specification (eIDAS message and attribute profile). Both are publicly available. The common eIDAS components need to be implemented – for as far as not already in place today – by the authentication connector and authentication proxy roles.

Please note, that in the second pilot iteration, piloting partners need to extend their eIDAS node with SEMPER attributes. The SEMPER extension to eIDAS uses the mechanism of 'domain specific attributes' that eIDAS supports already. In this way, the SEMPER extension does not break any eIDAS functionality already in place. The SEMPER extension does require maintenance and support during the lifetime of the DE4A project. Until end of 2020, the SEMPER project handled support & maintenance. As the SEMPER project has finished, currently there is no support & maintenance arrangement for SEMPER. This is a risk to the DE4A project.

1.2.1.1 Process realisation

The table below presents the components that implement the common application services for the DBA pilot.

Table 118: Solution architecture: Common application services

Role	Process	Application service	Components
Authentication connector	Request authentication	Authentication initiation	• eIDAS connector • SEMPER extension
Authentication proxy	Provide authentication details (user)	User authentication	• eIDAS proxy • SEMPER extension

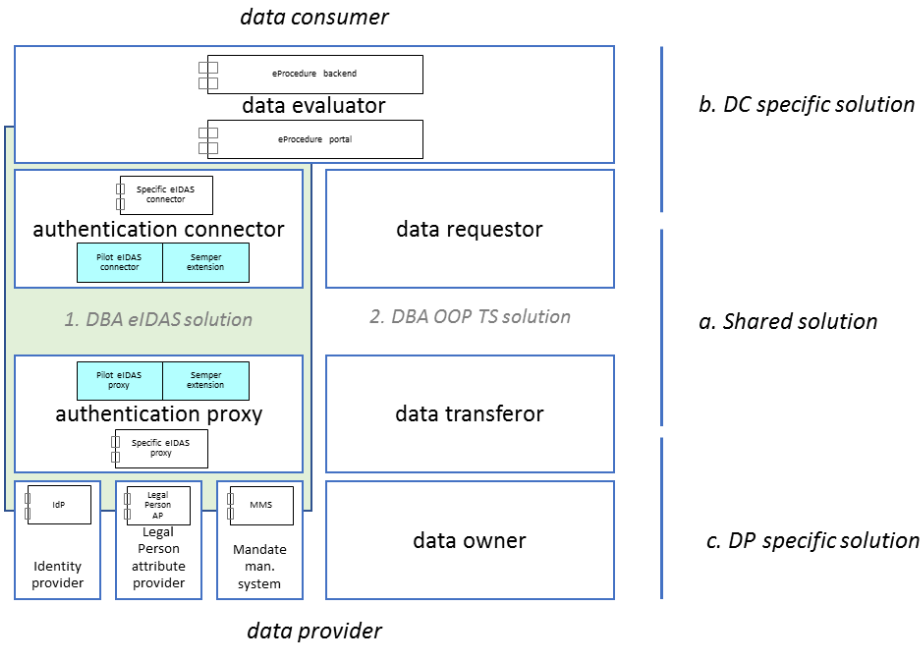


Figure 24: Solution architecture: common application services

1.2.1.2 Component description

Table 119: eIDAS solution: Component description

Component	Short description of its use
eIDAS connector	The component Member States implement to connect to the eIDAS network as a relying party. The connector accepts authentication requests from the service providers of the Member State and forwards the requests to the Member States that needs to authenticate the user. After authentication, the eIDAS connector receives the authentication results and sends them to the requesting service provider (relying party). The eIDAS connector can be implemented using CEF's reference software or a custom implementation compliant to the eIDAS interoperability specifications. The CEF reference software implements – besides the eIDAS SAML profile – also the JSON/REST eIDAS Light protocol to connect to national infrastructure.
eIDAS proxy	The component Member States implement to allow authentication with their (notified) eID for services provided in other Member States. The eIDAS proxy receives authentication requests from relying Member States, coordinates authentication, retrieval of legal person attributes and powers validation. The eIDAS proxy then sends the result to the requesting eIDAS connector. Just like the eIDAS connector, the eIDAS proxy can be implemented using CEF's reference software or a custom implementation compliant to the eIDAS interoperability specifications. The CEF reference software implements – besides the eIDAS SAML profile – also the JSON/REST eIDAS Light protocol to connect to national infrastructure.
SEMPER extension	The eIDAS interoperability architecture as well as the CEF reference implementation allow for extension of eIDAS with additional – domain specific – attributes. The SEMPER project used this option to include attributes on the powers requested ('powers validation request') and the result of powers validation ('the powers declaration'). The SEMPER extension leaves the eIDAS functionality untouched but extends its use with an addition to the SAML profile and the Light protocol.

1.2.1.3 Requirements

The DBA pilot did not define any additional requirements for the common eIDAS components (connector, proxy and extension). The use of these component has been assessed to ensure the components fulfil the pilot's needs. The pilot partners conclude that the CEF reference software as well as the SEMPER extension fulfil the needs of the DBA pilot. Of course, while running the pilot additional requirements for the eIDAS domain may arise.

Table 120: eIDAS solution: requirements

Requirement	First iteration (MVP)	Second iteration
MS support for a dedicated eIDAS pilot infrastructure.	Y	Y
Availability of CEF reference software version 2.4	Y	Y
Availability of CEF 2.4 compliant SEMPER extension	N	Y

Please note that Sweden has a custom implementation of the eIDAS node. Sweden needs to extend their custom implementation with SEMPER attributes for the second pilot iteration.

1.2.1.4 Component Implementation

The eIDAS components will be implemented by the pilot Member States as dedicated nodes for the DBA pilot to prevent interference with regular eIDAS production systems. Additionally, the dedicated pilot eIDAS network allows Member States to accept non-notified eID's for piloting purposes only. For more information on the use of the dedicated pilot network, please refer to the DBA discussion paper on this topic.

The versions to implement:

- eIDAS connector and proxy: CEF reference software 2.4 or custom implementation with eIDAS profile 1.1 (Sweden)[40].
- SEMPER extension: compliant with CEF version 2.4.

Both the CEF 2.4 reference software and the 2.4-compatible SEMPER extension are currently available. The custom implementation of eIDAS (SE) might need adaptation to cater for the legal person attributes and the (SEMPER) powers validation attributes.

1.2.1.5 Expected logical interfaces

The table below presents the interfaces expected for each of the components on a logical level. The interfaces as specified in the table are compliant with the eIDAS specification version 1.1, the eIDAS reference software 2.4 as well as the SEMPER extension.

Table 121: eIDAS solution: expected interfaces

Component	Expected interface
eIDAS connector	IN (request from SP / specific connector to eIDAS connector) Attributes: ▸ Service provider name (opt) ▸ Required LoA ▸ Required Natural Person attributes ▸ Required Legal Person attributes ▸ Proxy Member State ISO code OUT (response from eIDAS connector to SP / specific connector) Attributes: ▸ LoA ▸ Natural Person attributes ▸ Legal Person attributes ▸ Authentication status
eIDAS proxy	OUT (request from eIDAS proxy to eID / specific proxy) Attributes: ▸ Service provider name (opt) ▸ Required LoA

[40] Currently, Sweden has implemented profile 1.2. It needs to be assessed whether this version of the eIDAS profile is fully backwards compatible with version 1.1.

	▸ Required Natural Person attributes ▸ Required Legal Person attributes ▸ Connector Member State ISO code IN (response from eID / specific proxy to eIDAS proxy) Attributes: ▸ LoA ▸ Natural Person attributes ▸ Legal Person attributes ▸ Authentication status
eIDAS connector including SEMPER extension	Same as eIDAS connector without SEMPER extension, but additionally: powers validation request (scope of powers, type of representation allowed, type of powers accepted). Not required for MVP: in the MVP the pilot partners will validate full powers without explicit powers declaration. Authentication will fail as soon as the representative does not have the powers to represent the company[41].
eIDAS proxy including SEMPER extension	Same as eIDAS connector without SEMPER extension, but additionally: powers declaration (validation result, type of representation, type of powers). Not required for MVP[42].

1.2.2 DC specific solution

The DC specific eIDAS architecture consists of the data evaluator specific services and the authentication connector specific services. The DC specific solution is different for every DC. Its solution architecture will be specified in the design documents of the DC pilot processes (one for each data consumer). Nonetheless the DC-specific solution at a higher level of abstraction shows similarities. These are addressed in this section.

1.2.2.1 Process realisation

The table below presents the components that implement the application services for the DBA pilot.

41 A Member State operating a SEMPER extended eIDAS connector in the first pilot iteration may choose to send (1) a regular eIDAS authentication request and (2) to send a SEMPER extended eIDAS request. In case of (1) the SEMPER extended connector will receive a regular eIDAS response from the eIDAS proxy service in the other Member State. The SEMPER extension will be 'idle' then in the first pilot iteration (MVP). In case of (2), the non-extended proxy will ignore the SEMPER attributes in the authentication request. It will return a regular eIDAS response as well. That's why Member States may choose to deploy the SEMPER extension in the first pilot iteration without using the SEMPER functionality yet.

42 A Member State may choose to install the SEMPER extension to the eIDAS proxy in the first pilot iteration already. But as long as the requesting Member States (the connectors) don't request a SEMPER powers declaration, the SEMPER extension remains idle.

Table 122: DC: Components implemented by application services

Role	Process	Application service	Components
Data evaluator	Request authentication	Authentication initiation (collaboration: eProcedure portal)	eProcedure portal and backend (different for each DC participant)
Authentication connector	Request authentication	Authentication initiation (collaboration: eProcedure portal)	Specific eIDAS connector (different for each Member State).

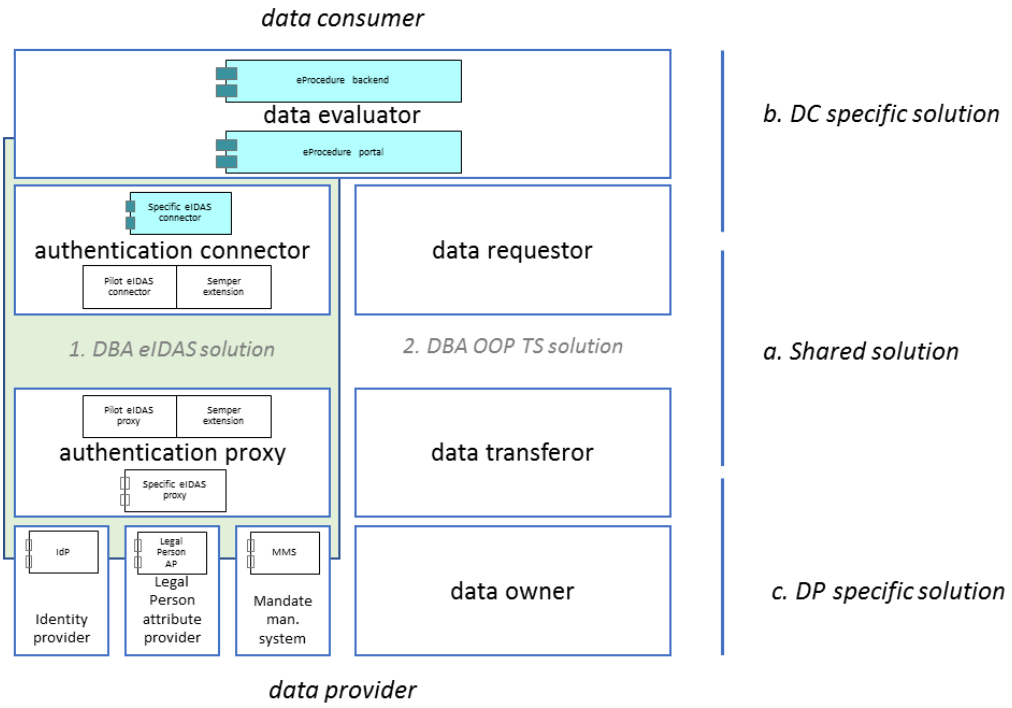


Figure 25: Solution architecture: Data consumer

1.2.2.2 Component description

Table 123: DC Components description

Component	Short description of its use
eProcedure Portal	The eProcedure portal (like MijnRVO.nl – see the DC-specific detailed pilot process documents) should connect to the national eIDAS connector. This requires the eProcedure portal to add the eIDAS login option to the login-webpage and the interface to the specific eIDAS connector (see below). As the DBA Pilot will use a dedicated network of eIDAS nodes, the eIDAS login option should be separated from the regular eIDAS login option (in case already

Component	Short description of its use
	available on the eProcedure portal). The DBA login option should invoke the dedicated eIDAS connector instead of the regular one (a different URL). Of relevance here is the type of eIDAS authentication request that the portal should implement: ▸ authentication at *LoA substantial* ▸ requesting the natural person attributes (at least the mandatory ones) ▸ requesting the legal person attributes (at least the mandatory ones) After receiving the authentication response, the Member State specific portal should: ▸ deny the user access in case of an "authentication failed". ▸ grant the user access in case of an "authentication successful". In case of the latter, the data evaluator grants the user access to all eServices of the portal.
eProcedure back-end	The eProcedure back-end handles all eProcedure specific functions, like registering the company in the company portal and assessing F-tax.
Specific eIDAS connector	The specific eIDAS connector transforms the national eID protocol into the eIDAS protocol. Member States usually implement one or more components to 'bridge' eIDAS to the national eID infrastructure. As from CEF eIDAS reference software 2.0, Member States may use the eIDAS Light protocol for this.

1.2.2.3 Requirements

The table below presents the requirements that the data evaluator and the authentication connector must implement. These concern the DC specific implementation only.

Table 124: DC requirements

Role	Requirement	First iteration (MVP)	Second iteration
Data evaluator	The eProcedure portal adds an eIDAS login option for piloting.	Y	Y
	The eProcedure portal connects to a *dedicated* eIDAS pilot node.	Y	Y
	The eProcedure portal requests eIDAS legal person attributes (mandatory ones)	Y	Y
	The eProcedure portal grants the user access on behalf of the company in case of an "authentication successful" response.	Y	Y
	The eProcedure portal additionally constructs a fine-grained powers validation request.	N	Y
	The eProcedure portal validates the Powers declaration received.	N	Y

Authentication connector	MS implements eIDAS connector 2.4. In case of a custom implementation (like Sweden) an attribute profile 1.1-compliant version of the connector will be used for piloting.	Y	Y
	MS implements SEMPER extension to the eIDAS connector.	N	Y

1.2.2.4 Component implementation

This section is fully DC-specific. Please refer to the detailed process design documents.

1.2.2.5 Expected logical interfaces

This section is fully DC-specific. Please refer to the detailed process design documents.

1.2.3 DP specific solution

In the intermediation pattern the user will authenticate to the data evaluator only. This will be done by invoking the eIDAS proxy of the data providing Member State. The data providing Member States implements several eIDAS-related roles for this purpose: authentication proxy, Identity Provider, Attribute Provider and Mandate Management System.

The DP specific eIDAS architecture consists of the Member State specific eID components as well as the eIDAS proxy components needed to bridge the national eID to the eIDAS network. The DP specific solution is different for every DP. The DP specific solution architecture will be specified in the design documents of the pilot processes (one for each data provider). Nonetheless the DP-specific solution at a higher level of abstraction show similarities. These will be addressed in this section.

1.2.3.1 Process realisation

The table below presents the components that implement the application services for the DBA pilot.

Table 125: DP: Components implemented by application services

Role	Process	Application service	Components
Authentication proxy	Provide authentication details	User authentication	Specific eIDAS proxy (different for each Member State).
Data owner (Identity Provider)	Provide authentication details	User authentication	IdP
Data owner (Legal person attribute provider)	Provide authentication details	User authentication	Legal Person AP
Data owner (mandate management system)	Provide authentication details	User authentication	MMS

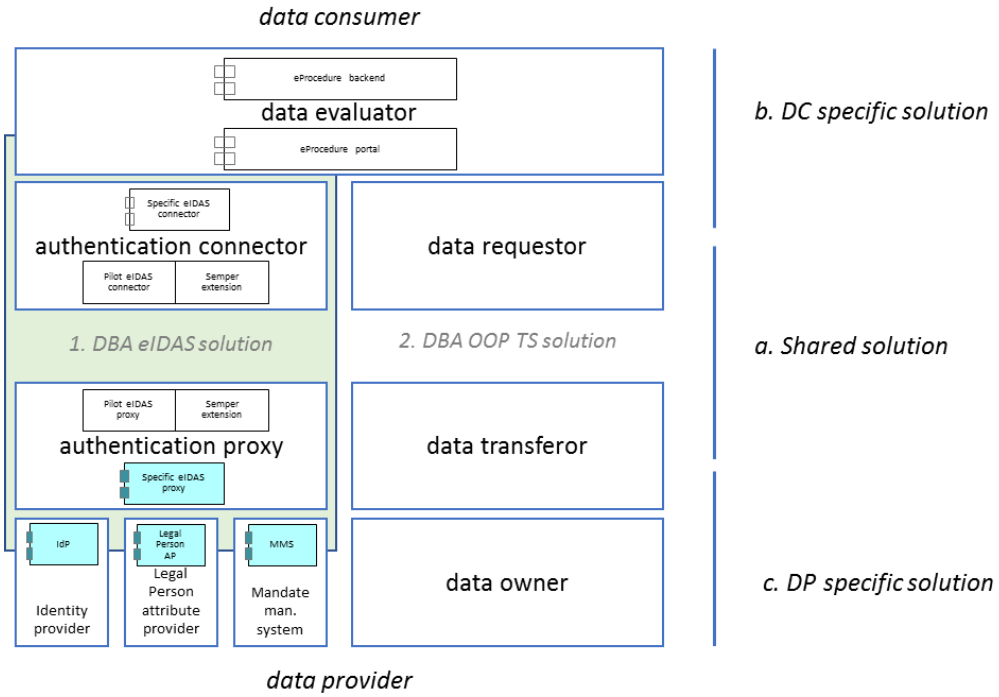


Figure 26: Solution architecture: Data provider

1.2.3.2 Component description

Table 126: DP Components description

Component	Short description of its use
Specific eIDAS proxy	The specific eIDAS proxy transforms the eIDAS protocol into national eID protocol. Member States usually implement one or more components to 'bridge' eIDAS to the national eID infrastructure. As from CEF eIDAS reference software 2.0, Member States may use the eIDAS Light protocol for this. Furthermore, the eIDAS proxy coordinates the login process at the DP Member State by triggering the IdP, Legal Person AP and MMS.
IdP	The Identity Provider handles authentication of the natural person. The IdP may be notified under eIDAS, but does not need to be notified to be used in the DBA pilot.
Legal Person AP	Member States need to provide the identifying attributes of the legal person (eIDASLegalPersonIdentifier and eIDASLegalName) to the specific eIDAS proxy. The Legal Person attributes may be integrated in the national eID scheme. For example, in eRecognition (NL) the mandate management system also provides the legal person attributes. MMS and Legal Person AP are one and the same component then.
MMS	The source of powers of the natural person to represent the company. In the DBA MVP, this source must be used to verify full powers only. In the MVP the declaration of powers that results from validating full powers is implicit: in case the authentication is successful, the user will have full powers to represent the company.

1.2.3.3 Requirements

The table below presents the requirements that the data provider must implement.

Table 127: DC requirements

Role	Requirement	First iteration (MVP)	Second iteration
Authentication proxy	Ms connects an IdP to the eIDAS proxy node for authenticating the natural person	Y	Y
	MS connects attribute provider (AP) to eIDAS node for eIDAS legal person attributes (in case not integrated in the MMS).	Y	Y
	MS connects mandate management system (MMS) to eIDAS node for validating full powers. Note: AP and MMS could be the same data source.	Y	Y
	Ms validates full powers	Y	Y
	MS adds fine-grained powers validation	N	Y
	MS implements CEF eIDAS proxy 2.4. In case of a custom implementation (like Sweden) an attribute profile 1.1-compliant version of the connector will be used for piloting.	Y	Y
	MS implements SEMPER extension to the eIDAS connector.	N	Y

1.2.3.4 Component implementation

This section is fully DP-specific. Please refer to the detailed process design documents.

1.2.3.5 Expected logical interfaces

This section is fully DP-specific. Please refer to the detailed process design documents.

1.3 DBA OOP TS solution

The shared solution for the OOP TS consists of all common functionality of the OOP technical system. Most of the common OOP TS components need to be implemented by the data requestor and data transferor, although the OOP TS uses two central components as well[43].

[43] The "data requestor" and "data transferor" refer to organisation roles. Member States may implement several roles in a single organisation. E.g. in The Netherlands RVO will take on the role of data evaluator, data requestor and data transferor.

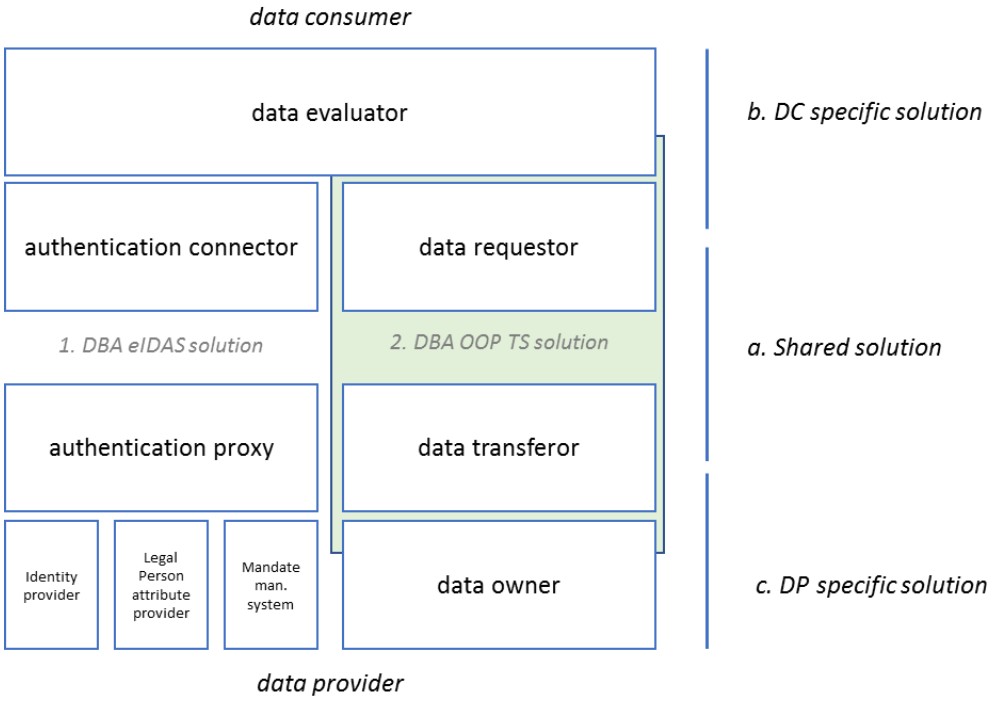


Figure 27: Solution architecture: DBA OOP TS

1.3.1 Shared solution

The OOP TS domain (WP5) should provide the data requestor and data transferor with the components needed for cross-border evidence exchange. Although this is very complex at a technical level, from a business logic perspective it is not due to MVP-limitations. In the MVP the DBA pilot uses just one type of evidence ('company dataset') that all DC's and DP's involved will use. There will be just one data provider per Member State: the business register, which is the authentic source of company information. The DC will request just one Member State for the evidence at a time (only one evidence will need to be requested to the data owner for the procedure and that will contain all the needed information by the data evaluator). Please see the DBA evidence data definition in section 3.5 for more information on the data-elements included in the company data evidence.

Although the explicit request and the preview functions will be implemented by the DC in its eProcedure portal, DBA expects guidelines for doing so (MVP) and reference software to ease the implementation (second pilot iteration). That's why the requirements for these functionalities have been included in this section.

1.3.1.1 Process realisation

The table below presents the components that implement the application services for the DBA pilot. Encryption and signing will be done at the level of the eDelivery AS4 gateways (no E2E encryption foreseen).

Table 128: OOP TS: Components implemented by application services

Process	Application service	Components
Lookup routing information (DC)	Inquire routing information (collaboration : information desk)	▸ DE4A connector ▸ Evidence service locator (ESL) configuration file ▸ SMP ▸ DNS & SML
Request evidence (DC)	Message encryption e-signature creation service data exchange service	▸ DE4A Connector ▸ eDelivery AS4 gateway
Forward evidence (DC)	Message decryption e-signature verification and validation service data exchange service	▸ DE4A Connector ▸ eDelivery AS4 gateway
Evaluate evidence request (DP)	Message decryption e-signature verification and validation service data exchange service	▸ DE4A Connector ▸ eDelivery AS4 gateway
Communicate non-availability of OOP (DP)	data exchange service	▸ DE4A Connector ▸ eDelivery AS4 gateway
Transfer evidence (DP)	Message encryption e-signature creation service data exchange service	▸ DE4A connector ▸ Configuration file to find the participant identifier ▸ SMP ▸ DNS & SML

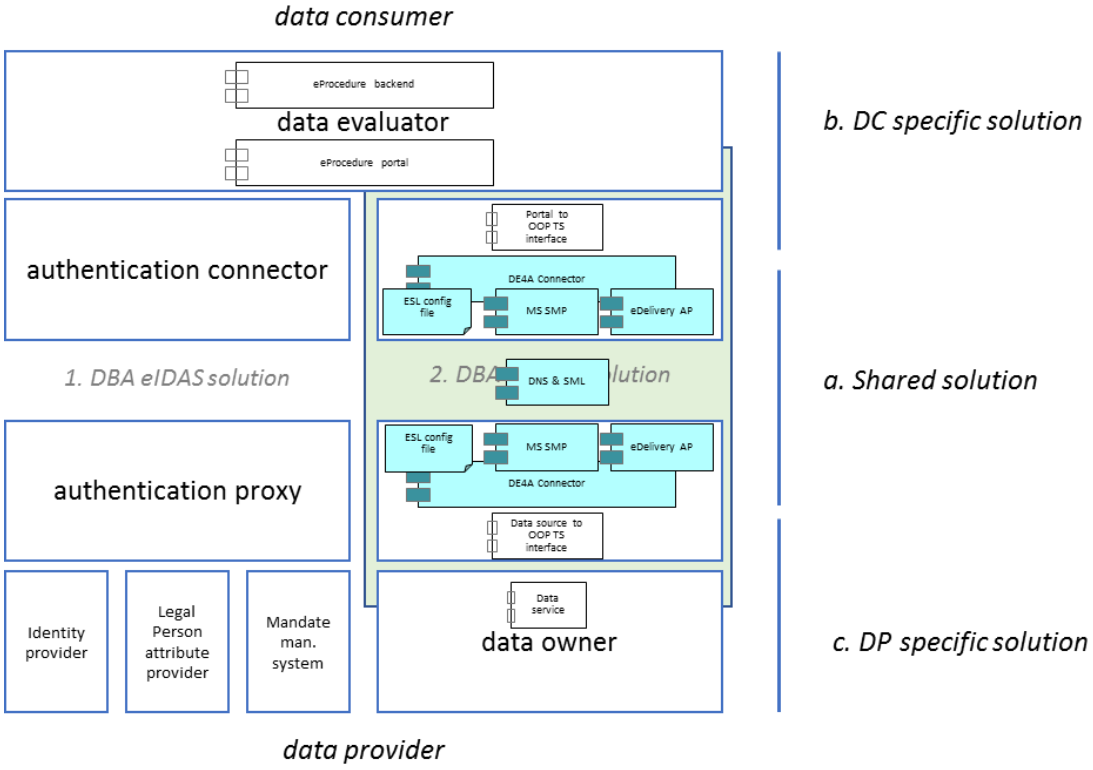


Figure 28: Solution architecture: OOP TS Shared components

1.3.1.2 Component description

Table 129: OOP TS: Components description

Component	Short description of its use
Evidence service locator (ESL) configuration file	As the DBA pilot's MVP uses just one type of evidence, with just one data provider per Member State (on NUTS0 level), there is no need for dynamic discovery of the data provider and its data services. For the DBA pilot it is sufficient to use a simple configuration file with the required elements (Member State and participant id).
SMP	For each evidence request and response, information on the receivers Access Point (URL) and its certificates are needed. Each Member State hosts an SMP for this purpose. Before sending a request or response, the sending party queries the SMP of the receiver to get this info. For initial testing purposes the SMP may be hosted centrally to ease implementation (to be decided by WP5).
DNS & SML	As there are multiple SMP's, the sending party needs to know where to find the SMP of the receiver to get the actual metadata. This location can be found in the centrally CEF-hosted DNS, that will be queried by the access point of the sending Member State. DNS entries will be created from the registration of SMP's: the SML, which is also centrally hosted by CEF.

eDelivery AS4 gateway	This component – also referred to as eDelivery access point – handles the secure transfer of the data, including encryption and decryption as well as signing/sealing and validating signatures/seals.
DE4A Connector	The DE4A connector is the reference software that data requestors and data transferors can use to connect to the OOP TS. This eases the work by abstracting the communication with the components.

Please note that for the DBA pilot the information desk can be implemented as a simple configuration file (service URI needed to retrieving routing information from SMP). This is deemed appropriate by the DBA pilot for the MVP. No dynamic discovery is needed. Furthermore, as the data providers are business registers (just one data provider per Member State) it is acceptable to use this configuration file.

For the first pilot iteration the follow components do not need to be implemented:

- Issuing Authority Locator (IAL): DBA has just one fixed authority per Member State for the company data. The authority will be included in the metadata configuration file.
- Evidence Service Locator (ESL): no dynamic mechanism for locating and understanding the evidence service is required in the first pilot iteration. The participant will be known in advance and included in the ESL configuration file.
- Cross-border Access Authorisation Registry (CAAR): The CAAR helps the DP to check if the request has the required authorization. This is not needed for the MVP of the DBA pilot as the pilot network will be limited to just the pilot partners only. Furthermore only a limited set of real companies will be invited to participate in the pilot and the company information is to a large extent available to anyone . The DP's will not validate the DC's authorisation to request the information in the first pilot iteration. In the final pilot iteration, the DP's may validate the authority if needed to prevent non-participating authorities to avoid paying the fees for the company data.
- Multilingual Ontology repository (MOR): due to the harmonisation of evidence, DBA will not implement an attribute transformation mechanism. The attributes are well defined and understood by the data evaluators participating in the pilot. All data elements (attributes) of the Company data evidence will be transformed into the canonical evidence as defined in the DBA pilot. This means all labels of the data-elements will be in English. Some values will be translated into English as well, as for other elements there is no use in translation. E.g. the legal form of the company is Member State specific and will not be *translated* or *transformed*. In any case, translation and transformation will be done by the data owner in its data services.

1.3.1.3 Requirements

The table below presents the requirements for the common application services in the OOP TS domain. Please note that the requirements for the second pilot iteration (not MVP) have been included as a sketch only (and have been greyed out). It is likely additional requirements for the second pilot iteration will be defined later on in the project.

Table 130: OOP TS: requirements

Application service	Requirement	First iteration (MVP)	Second iteration
Data Exchange Service	Provides supports for requesting a specific (canonical) evidence type, where an evidence type is defined as a fixed collection of evidence data- elements.	Y	Y
	Supports evidence requests, including in the request the following data-elements: ▸ data evaluator ▸ data evaluating Member State ▸ company code (eIDASLegalPersonIdentifier) ▸ company name (eIDASLegalName) ▸ eIDAS natural person minimum dataset ▸ data providing Member State ▸ data provider ▸ requested canonical evidence type	Y	Y
	The request and the response are uniquely relatable.	Y	Y
	The exchange of evidence is uninterrupted. The user will wait online for the evidence to be available at the DC.	Y	Y
	The response message supports the Doing Business Abroad evidence type (XSD to be provided by WP3).	Y	Y
	The service response is either the evidence(success) or a failure message.	Y	Y
	The service supports functional and technical error codes in case of failed request processing.	Y	Y
	The endpoint to which the request will be sent is available 99,5% except for scheduled maintenance (mainly a responsibility of the data requestor)	N	Y
	The service provides a response within 10 seconds. The actual performance depends on several factors and should be assessed by performance testing.	N	Y
	The service supports encrypted exchange of the request and the response between Member States (DR & DT) as well as between DE & DR and between DT & DP. The service establishes a trust relation between DP and DC. If needed a certificate scheme is developed, managed and maintained.	Y	Y
	Supports logging & audit trail of the following data: ▸ Data consumer ▸ Data provider ▸ Entity concerned (company id)	N	Y

Application service	Requirement	First iteration (MVP)	Second iteration
	▸ Evidence type (e.g. company registration evidence) ▸ Hash of the evidence (not the evidence itself) ▸ Date and time of exchange ▸ Result (success, fail) ▸ Reason for fail (…)		
Inquire routing information	Minimum functionality needed for correct routing on a technical level.	Y	Y
Message encryption	Basic message encryption	Y	Y
Message decryption	Basic message decryption	Y	Y
e-Signature Creation Service	Basic message signing/sealing	Y	Y
e-Signature Validation Service	Basic verification of signatures/seals	Y	Y

Although each eProcedure portal will implement the explicit request and preview function individually, the DBA pilot does define requirements for a common user interaction in the MVP.

Table 131: OOP TS: User interaction requirements

Application Service	Requirement	First iteration (MVP)	Second iteration
Evidence preview	Contains UX guidelines for the preview web page that Data Evaluators need to implement in their system: ▸ The preview allows the user to optionally view the evidence retrieved. ▸ The preview is able to display the Doing Business Abroad evidence type. ▸ The preview allows the user to accept or deny the evidence transfer. ▸ The UX guidelines specify the user interaction components (button or checkbox, placement of text with relation to interaction components…) ▸ The UX guidelines specify the visual design requirements (font, colour, images, …) ▸ Contains text that needs to be displayed to inform user about the preview.	Y	Y

Application Service	Requirement	First iteration (MVP)	Second iteration
	- The text is compliant to legal requirements (SDG, pilot situation, …) - The text is compliant to user centricity requirements (understandable, …) ▸ Include wireframes (GUI mock-ups)		
	The Preview service should be available as reference software (to be implemented by data evaluator or data requestor).	N	Y
	The preview allows an 'image' data element to be shown to the user, e.g. an image of the original document (formatted data).	N	Y
	The preview allows for smart formatting of structured data with plugins provided by the data provider (including company logo, etc.).	N	Y
	The preview allows the user to select a reason for denial (e.g. error in data).	N	Y
	The preview provides for a feedback mechanism to the data provider in case there is an error in the data.	N	Y
	The preview has logic for handling legal exceptions to the preview obligation, meaning that the preview will only be offered in cases that this is required by SDGR.	N	Y
Explicit request	Contains UX guidelines for the explicit request web page that Data Evaluators need to implement in their system: ▸ The GUI allows the user to proceed with the evidence retrieval or to select an alternative channel (the previous existing in-person procedure). ▸ The UX guidelines specify the user interaction components (button or checkbox, placement of text with relation to interaction components…) ▸ The UX guidelines specify the visual design requirements (font, colour, images, …) ▸ Contains text that needs to be displayed to inform user about the explicit request. - The text is compliant to legal requirements (SDG, pilot situation, …) - The text is compliant to user centricity requirements (understandable, …) ▸ Include wireframes (GUI mock-ups)	Y	Y
	The Explicit Request service should be available as reference software (to be implemented by data evaluator or data requestor).	N	Y
	Supports logging & audit trail of the following data: ▸ Data consumer	N	Y

Application Service	Requirement	First iteration (MVP)	Second iteration
	▸ Data provider ▸ Entity concerned (company id) ▸ Evidence type (e.g. company registration evidence) ▸ Date and time of explicit request ▸ Result (approved, denied) ▸ Reason for denial (…)		
	The explicit request GUI and reference software have logic for handling legal exceptions that exist for an explicit request, meaning that the option to explicit request will only be offered in cases that this is required by SDGR.	N	Y

1.3.1.4 Component implementation

CEF hosts a central DNS & SML that is widely in use today. DBA expects DE4A to use these components as well. The Evidence service locator (ESL) configuration file, SMP, eDelivery AS4 gateway and DE4A Connector need to be implemented and hosted by the data requestors and data transferors.

1.3.1.5 Expected logical interfaces

Table 132: OOP TS: logical interfaces

Component	Expected interface
Evidence service locator (ESL) configuration file	IN (from DE4A connector to ESL configuration file): ▸ Member State ▸ Canonical evidence type OUT from ESL configuration file to DE4A connector): ▸ participant ID
SMP	▸ IN (from DE4A connector to SMP): ▸ Participant ID OUT (from SMP to DE4A connector): ▸ Service URL ▸ Certificate to use
DNS & SML	IN (from DE4A connector to DNS): ▸ Member State ▸ Participant ID OUT (from DNS to DE4A connector): ▸ SMP location
eDelivery AS4 gateway	IN (from DE4A connector to eDelivery AS4 gateway): ▸ evidence request OUT (from eDelivery AS4 gateway to DE4A connector):

Component	Expected interface
	▸ Evidence response
DE4A Connector for locating the data owner[44]	IN (from data evaluator to DE4A connector): ▸ Data providing Member State ▸ Requested evidence type OUT (from DE4A connector to data evaluator): ▸ Data provider ID
DE4A Connector for requesting the evidence	IN (from data evaluator to DE4A connector): ▸ Data evaluator ID ▸ Requested evidence type ▸ Company identification (eIDASLegalPersonIdentifier, eIDASLegalName) ▸ Data provider ID OUT (from DE4A connector to data evaluator): ▸ Evidence (XML)

1.3.2 DC-specific solution

The DC specific solution is different for every DC. The DC specific solution architecture has been specified in Annex 4 – Member State specific pilot designs. Nonetheless the DC-specific solution at a higher level of abstraction show similarities.

The DC specific architecture consists of the evaluator and requestor specific services. The requestor specific services are typically implemented at Member State level.

The data evaluator:

- Integrates with the OOP TS via the DE4A connector
- Orchestrates business logic (invoke eIDAS and OOP TS)
- Manages explicit requests
- Creates and sends evidence requests
- Receives evidence
- Manages previews, approval and denial, including deletion of the evidence
- Checks the evidence
- Allows for completion by the user if needed
- Submits and validates the application for company registration
- Returns acknowledgement of receipt to the user
- Manages errors

The data requestor:

- Interacts with the information desk
- Parses the evidence request and response
- Encrypts and decrypts the request & response

[44] The data evaluator needs to contact the DE4A connector twice: (1) to request the ID of the data owner and (2) to request the evidence from the data owner.

- Manages errors

1.3.2.1 Process realization

Table 133: OOP TS DC scenario: Process realization

Process	Application service	Components
Establish user identity	Identity/record matching	eProcedure backend
Redirect user to another channel	Alternative channel	eProcedure portal
Prepare preview	Evidence preview	eProcedure portal
Evaluate evidence	Evidence status tracker Requirements/evidence matching	eProcedure portal
Delete evidence	Evidence shredder	eProcedure portal
Request public service	eProcedure initiation	eProcedure portal
Abort eProcedure	eProcedure termination	eProcedure portal
Request OOP transfer of evidence	Explicit request	eProcedure portal portal to OOP TS interface
Follow evidence status	Evidence status overview	eProcedure portal portal to OOP TS interface
Preview evidence	Evidence preview	eProcedure portal
Receive acknowledgement of receipt	eProcedure confirmation	eProcedure portal portal to OOP TS interface
Submit eProcedure	eProcedure submission	eProcedure portal
Receive public service result	receive (public) service result	eProcedure portal

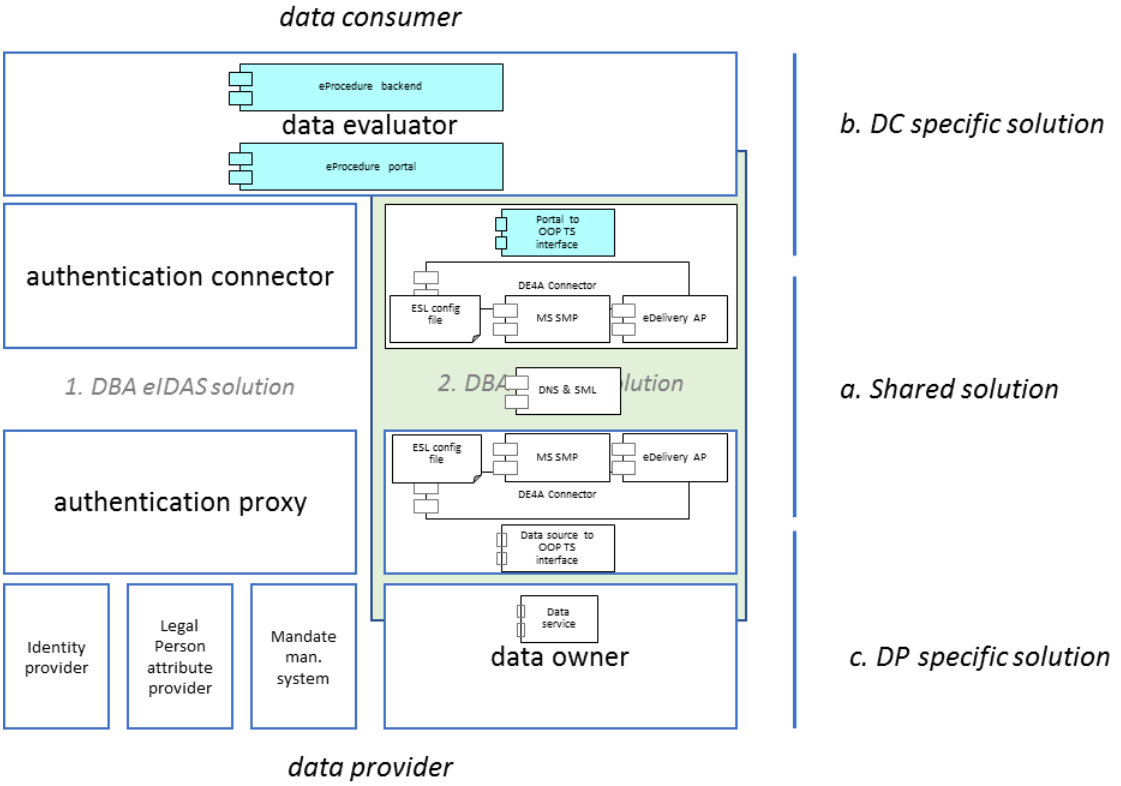


Figure 29: Solution architecture: DBA OOP TS DC components

1.3.2.2 Component description

Table 134: OOP TS DC scenario: components

Component	Short description of its use
eProcedure portal	The eProcedure portal should be adapted to support the use of the cross-border evidence in the process. For that purpose it should facilitate the user in the OOP-process and connect to the OOP TS. Connection to the OOP TS is typically implemented via a Portal-to-OOP TS-interface that may utilise national OOP-protocols and infrastructure.
eProcedure backend	The eProcedure backend handles all eProcedure specific logic. For the DBA pilot this backend functionality basically remains unchanged. One addition to the backend may be the record matching on the company (for companies registered prior to the pilot)[45].
Portal to OOP TS interface	Member States may (but do not need to) implement an interface from national OOP protocols to the DE4A data model (DE4A connector). Such an interface guarantees that the data evaluator

45 This is required for eProcedure portals that have companies registered already without the eIDASLegalPersonIdentifier (probably BE and AT). SE and RO choose to start with an empty company registry for piloting and therefore don't need record matching. NL examines the possibility to add the eIDASLegalPersonIdentifier to all foreign companies prior to the Piot start. If successful, NL does not need record matching either.

	can use the same (national) OOP protocols and services for cross-border use as well.

1.3.2.3 Requirements

The requirements below need to be implemented by the data evaluator and/or data requestor.

Table 135: OOP TS DC scenario: Requirements

Application Service	Requirement	First iteration (MVP)	Second iteration
eProcedure Initiation	The eProcedure portal has web page with the option to start the eService to pilot.	Y	Y
	The eProcedure portal is connected to (national) OOP TS.	Y	Y
eProcedure termination	The eProcedure portal has web page with information on the termination of the eService mentioning the alternative channel.	Y	Y
eProcedure save and resume	Not to be implemented by DBA		
eProcedure confirmation	The eProcedure portal confirms use of the evidence received to the user.	Y	Y
eProcedure submission	The eProcedure portal has web page to inform user that it applies for the eService when proceeding. The representative should be made aware that confirmation has legal consequences for the company involved.	Y	Y
Alternative channel	The eProcedure portal has a web page stating that the alternative channel is out of scope for the pilot.	Y	Y
Procedural requirements determination	The eProcedure portal implements requirements validation in case that's required for the eProcedure, e.g. validate whether the company concerned is up and running and didn't file for bankruptcy.	Y	Y
Requirements/evidence matching	The DBA pilot will probably use just one canonical evidence, so no evidence matching is required.	-	-
Available evidence determination	The eProcedure portal checks whether the portal's registry has the company information available already (in that case it will not retrieve the evidence again). This may happen when a company wants to apply for another eService at this eProcedure portal.	Y	Y

Application Service	Requirement	First iteration (MVP)	Second iteration
Evidence status overview	The eProcedure portal shows whether evidence retrieval has been successful or failed.	Y	Y
	The eProcedure portal shows more detailed information on status of evidence exchange.	N	Y
	In case of a fail: the eProcedure shows information on the reason for non-availability of the evidence.	N	Y
Evidence request tracker	Session management to be implemented by eProcedure portal to make sure each request receives a response.	Y	Y
Evidence shredder	eProcedure portal specific function to delete all received data.	Y	Y
Evidence status tracker	Provides information on success and failure only.	Y	Y
	Provides more detailed information on the reason for failing.	N	Y
Explicit request	The data evaluator implements the UX guidelines to be provided by WP5	Y	Y
	The data evaluator may implement the explicit request component to be provided by WP5.	N	Y
Evidence preview	The data evaluator implements the UX guidelines to be provided by WP5	Y	Y
	The data evaluator may implement preview component to be provided by WP5.	N	Y
Identity/record matching	The data evaluator may implement a function for checking whether the company has been registered at the company portal prior to pilot start. These companies cannot be found by their eIDASLegalPersonIdentifier and should be matched using their legal name (and possibly one or more user provided attributes).	Y	Y

1.3.2.4 Component implementation

This section is fully DC-specific. Please refer to the detailed process design documents.

1.3.2.5 Expected logical interfaces

This section is fully DC-specific. Please refer to the detailed process design documents.

1.3.3 DP-specific solution

The DP specific solution consists of the data provider's data service and the connection of this data service to the OOP TS. The DP specific solution consists of:

1. Data owner specific services:

   The application services that are specific to a single data owner. The DBA pilot intends to agree on the definition of one evidence type for use case 1 that all data providers can provide and data evaluators will use. Providing the attributes of this evidence type might need adaptation of current data services. Furthermore, the data owner needs to connect its data services to the national OOP TS components.

2. Data Transferor specific services:

   The Member State specific parts of eIDAS and the OOP TS that may be needed for integration of eIDAS and the OOP TS into current national OOP-networks (if applicable).

The data owner:

- Integrates to the OOP TS
- Receives and validates the evidence request
- Extracts evidence
- Creates and sends evidence response
- Manages errors

The data transferor:

- Interacts with the information desk
- Parses the evidence request and response
- Encrypts and decrypts the request & response
- Manages errors

1.3.3.1 Process realization

Message encryption/decryption and e-signature in the table refer to the encrypting and signing of messages between the data transferor and data owner. It is up to each Member State to define implement this communication in a way that is fulfils national requirements.

Table 136: OOP TS DP scenario: Process realization

Process	Application service	Components
Evaluate evidence request	Data exchange service Message decryption e-signature verification and validation	Portal to OOP TS interface
Extract evidence	Evidence lookup	Data service
Transfer evidence	Data exchange service Message encryption eSignature creation service	Portal to OOP TS interface

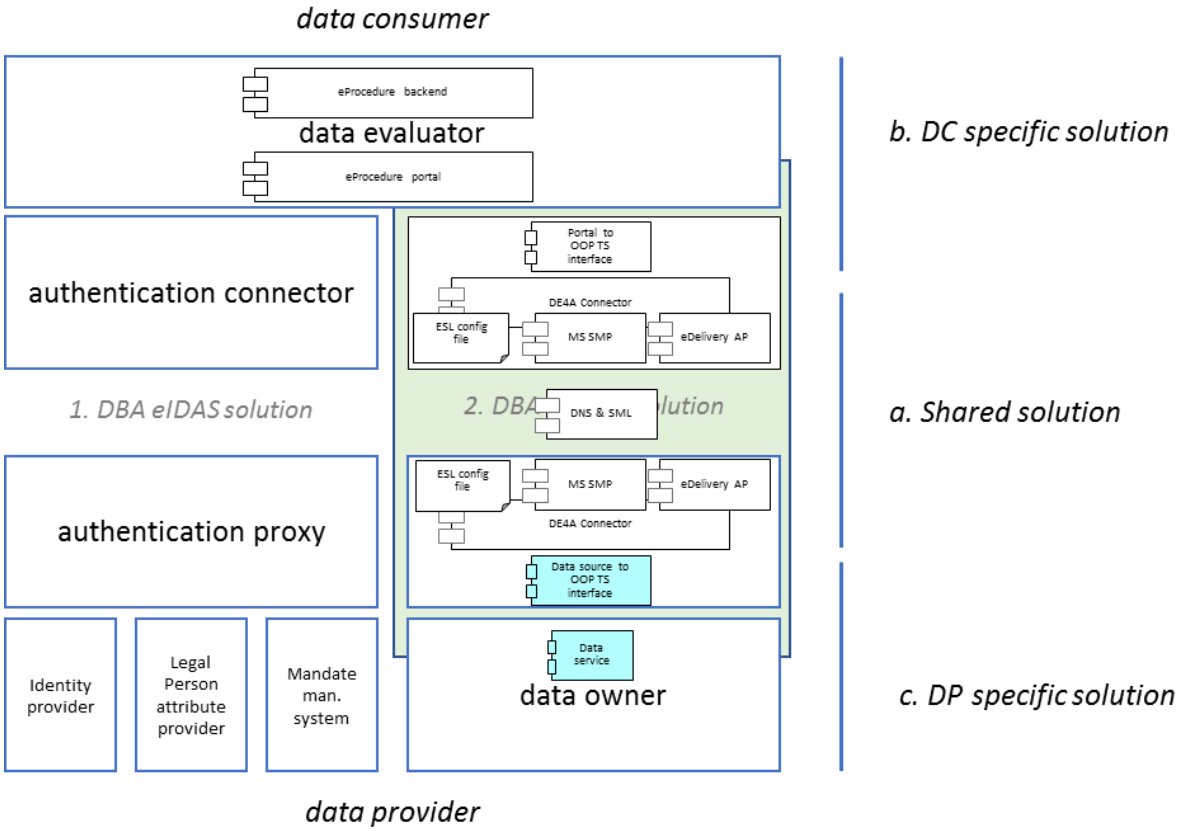


Figure 30: Solution architecture: DBA OOP TS DP components

1.3.3.2 Component description

Table 137: OOP TS DP scenario: Components

Component	Short description of its use
Data service	The webservice of the data provider that will output the evidence requested.
Data service to OOP TS interface	Member States may (but do not need to) implement an interface from national OOP protocols to the DE4A data model (DE4A connector).

1.3.3.3 Requirements

The table below presents the requirements for the DP-specific part of the solution. These requirements need to be fulfilled by the data owner and/or data transferor.

Table 138: OOP TS DP scenario: Requirements

Application Service	requirement	First iteration (MVP)	Second iteration
Evidence lookup	Adapt the DP data service to provide the DBA canonical evidence.	Y	Y
	Connect the data service to the OOP TS.	Y	Y
Message decryption	Basic message decryption for decrypting messages from the data transferor to the data owner and vice versa.	Y	Y
Message encryption	Basic message encryption for encrypting messages from the data transferor to the data owner and vice versa.	Y	Y
eSignature creation service	Basic message signing / sealing	Y	Y
eSignature verification and validation service	Basic eSignature / eSeal verification	Y	Y

1.3.3.4 Component implementation

This section is fully DP-specific. Please refer to the detailed process design documents.

1.3.3.5 Expected logical interfaces

This section is fully DP-specific. Please refer to the detailed process design documents.

Annex 2 – Draft questionnaires

Draft questionnaire – Company

								Related criterion
1A	**How do you value the effort required to complete all tasks to enrol, looking at the following aspects:**	**Very much effort**	**Much effort**	**Reasonable effort**	**Little effort**	**Very little effort**		**B1.1**
	Collecting company data							
	Solving language barriers							
	Providing required data to the service provider							
	Solving problems							
	Understanding the procedure							
1B	**What did you appreciate or dislike regarding the effort required to complete the procedure in the portal?**							**B1.1**
2A	**How do you value the adequacy of the method to obtain and provide evidence that you are sufficiently authorized to represent the company you want to be registered, looking at the following aspects:**	**Very adequate**	**Adequate**	**Sufficient**	**Inadequate**	**Very inadequate**		**B2.1**
	Reliability of the method							
	Accessability of the method (Language challenges)							
	Simplicity of the method							
	Robustness of the method							
2B	**What did you appreciate or dislike regarding the effort required to complete the procedure in the portal?**							**B2.1**
3A	**How satisfied are you with the amount of time (duration) you spent to complete the procedure, looking at the following aspects:**	**Very satisfied**	**Satisfied**	**Sufficient**	**Unsatisfied**	**Very unsatisfied**		**B3.1**
	Collecting and providing information on the company							
	Collecting and providing proof that you are authorised to represent the company							
	Completing forms in the portal							
	Dealing with explicitly requesting the system to retrieve available information on the company, and previewing id before usage in the portal							
3B	**What did you appreciate or dislike regarding the amount of time (duration) you spent to complete the procedure?**							**B3.1**
4A	**How much money and time did you spend on applying for a service?**							**B4.1**
	Money spent							
	Time spent							
5A	**How would you like to confirm the retrieval of the data of the company you represent and preview the retrieved data in the following situations?**	**Never**	**Only once (ever)**	**Every time, but for allapproachable sources at once**	**Every time, and for each source separately**			**D3.1**
	In case information on your company is updated in your home country.							
	In case information on your company must be retrieved from multiple sources							

Draft questionnaire – Data Owner

								Related criterion
1A	**How do you appreciate the benefits of using the OOP TS, compared to the cost to integrate your data service with it, looking at the following benefits:**	**Benefits exceed cost considerably**	**Benefits exceed cost**	**Benefits are in balance with cost**	**Benefits are lower than cost**	**Benefits are considerably lower than cost**		**C1.1**
	Less manual effort for processing							
	Lower communication costs							
	Lower risk of errors due to manual processing and language challenges							
	Shorter duration of processing							
1B	**What did you appreciate or dislike regarding the bebefits and costs for using the OOP TS?**							**C1.1**
2A	**What was the effort involved to integrate to the OOP TS (manhours). Please only provide if this information is not confidential.**							**C3.1**

Draft form questionnaire – Data Evaluator

								Related criterion
	1A	**How do you appreciate the riliability of the company data when using the OOP TS compared to the traditional situation where the OOP TS is not used, considering the following aspects:**	**Considerably more reliable**	**More reliable**	**As reliable**	**Less reliable**	**Considerably less reliable**	**A1.1**
		Availability in electronic format						
		Availability in a structured format						
		Completeness						
		Meaningfullness of values						
		Correctness						
	1B	**What did you appreciate or dislike regarding the reliability of company data, when using the OOP TS?**						**A1.1**
	2A	**How do you appreciate the required effort to process the company data when using the OOP TS compared to the traditional situation where the OOP TS is not used, considering the following aspects:**	**Considerably more effort**	**More effort**	**Same effort**	**Less effort**	**Considerably less effort**	**A1.2**
		Interpretation of data						
		Solving errors and exceptions						
	2B	**What did you appreciate or dislike regarding the effort to process company data, when using the OOP TS?**						**A1.2**
	2C	**How much effort (manhours) do you estimate to save on processing company data, per application for a service?**						**A1.2**
	3A	**How do you appreciate the benefits of having the OOP TS keeping company information up-to-date in your systems, considering the following aspects: (ONLY SECOND ITERATION)**	**Considerably high benefits**	**Hig benefits**	**Medium benefits**	**Little benefits**	**Hardly any benefits**	**A1.3**
		Manual effort to maintain information on companies						
		Number of errors and exceptions due to depricated company information						
		Solving errors and exceptions due to company information being depricated						
		Communication effort and cost to retrieve up-to-date company information						
	3B	**What did you appreciate or dislike regarding theOOP TS keeping the company information in your sysyems up-to-date? (ONLY SECOND ITERATION)**						**A1.3**
	4A	**How do you appreciate the reliability of themethod to validate the powers of the representative compared to the traditional situation where the OOP TS is not used, considering the following aspects:**	**Considerably more reliable**	**More reliable**	**As reliable**	**Less reliable**	**Considerably less reliable**	**A2.1**
		Authenticity of proof						
		Accessability of proof (language and structure challenges)						
		Correctness of proof						
	4B	**What did you appreciate or dislike regarding the reliability of the method to validate the powers of the representative?**						**A2.1**
	5A	**How do you appreciate the reduction in effort to verify the powers of the representative when using the method from the pilot, compared to the traditional situation, considering the following aspects:**	**Considerably more effort**	**More effort**	**Same effort**	**Less effort**	**Considerably less effort**	**A2.2**
		Interpretation of data						
		Solving errors and exceptions						

6A	**How do you appreciate the benefits of using the OOP TS, compared to the cost to integrate your eProcedure portal with it, looking at the following benefits:**	**Benefits exceed cost considerably**	**Benefits exceed cost**	**Benefits are in balance with cost**	**Benefits are lower than cost**	**Benefits are considerably lower than cost**	**C2.1**
	Less manual effort for processing applications for a service and during service fulfilment						
	Lower communication costs						
	Lower risk of errors due to manual processing and language challenges						
	Data being kept up-to-date						
	Trustworthyness of the data						
	Shorter duration of processing						

6B	**What did you appreciate or dislike regarding the bebefits and costs for using the OOP TS?**	**C2.1**

7A	**What was the effort involved to integrate to the OOP TS, looking at the following elements. Please only provide if this information is <u>not</u> confidential.**	**C2.2**
	Integrating to the DE4A Connector	
	Developing the Explicit Request and Preview screens	
	Developing Record matching functionality	

8A	**How do you appreciate the extend to which the company information provided by the OOP TS fits your needs, looking at the following elements?**	**Very adequate**	**Adequate**	**Sufficient**	**Inadequate**	**Very inadequate**	**D1.1**
	Legal entity identification						
	Legal entity attributes (dates, status)						
	Contact points						
	Activities						
	Branch (only in second iteration)						
	Address						
	Information on representatives						

8B	**What did you appreciate or dislike regarding the avialable company information elements?**	**D1.1**

9A	**How do you appreciate the applicability of the Powers Validation method for your services, looking at the following aspects?**	**Very adequate**	**Adequate**	**Sufficient**	**Inadequate**	**Very inadequate**	**D2.1**
	Usability for the current pilot procedure						
	Usability for all other services you offer						
	Level of validation (fine-grained)						

9B	**What did you appreciate or dislike regarding the method of powers validation, looking at usability for all your services?**	**D2.1**

10A	**What did you appreciate or dislike regarding the check on companies that apply for a service/registraion, already existing in your registration**	**D4.1**

11A	**What did you appreciate or dislike regarding the mechanism that keeps Company Data in your system up-to-date?**	**D5.1**

Draft questionnaire – Member State

								Related criterion
1A	**How do you appreciate the benefits of integrating the Mandate Management System to eIDAS for automated Powers Validation, compared to the cost looking at the following benefits:**	**Benefits exceed cost considerably**	**Benefits exceed cost**	**Benefits are in balance with cost**	**Benefits are lower than cost**	**Benefits are considerably lower than cost**		**C3.1**
	Higher reliability							
	Shorter duration							
	Less manual effort							
2A	**What was the effort involved to integrate the MMS (manhours). Please only provide if this information is <u>not</u> confidential.**							**C3.2**
3A	**How do you appreciate the benefits of setting up and deploying the DE4A Connector node to your national infrastructure, compared to the cost, looking at the following benefits:**	**Benefits exceed cost considerably**	**Benefits exceed cost**	**Benefits are in balance with cost**	**Benefits are lower than cost**	**Benefits are considerably lower than cost**		**C4.1**
	Lower communication cost							
	horter process duration for your serviceproviders and							
	Reliable communication							
	Connection to reliable data sources							
4A	**What was the effort involved to set-up and deploy the DE4A Connector node (manhours). Please only provide if this information is <u>not</u> confidential.**							**C4.2**

Annex 3 – XSD of company registration evidence type

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
        xmlns="urn:eu-de4a:xsd:CanonicalEvidenceType::CompanyRegistration:v0.6"
        targetNamespace="urn:eu-de4a:xsd:CanonicalEvidenceType::CompanyRegistration:v0.6"
        elementFormDefault="qualified"
        attributeFormDefault="unqualified"
        xmlns:cvb="http://www.w3.org/ns/corevocabulary/BasicComponents">
 <!-- Import xml: namespace -->
 <xs:import namespace="http://www.w3.org/XML/1998/namespace" schemaLocation="xml.xsd"/>
 <!-- Import W3C Core Vocabularies basic elements -->
 <xs:import namespace="http://www.w3.org/ns/corevocabulary/BasicComponents"
schemaLocation="CoreVocabularies-BasicComponents-1.1.xsd" />

 <!-- xml schema for CompanyInfo canonical evidence -->

 <xs:element name="LegalEntity" type="LegalEntityType"/>
 <xs:complexType name="LegalEntityType">
  <xs:annotation>
   <xs:documentation>
    Company's legal information
    - CompanyName: This is the primary name of the company. Can be provided for multiple
languages.
    - CompanyType: Type of the company based on ISO 20275 (e.g: SA, PLC, LLC, GmbH etc)
    - CompanyStatus: Company status as defined in BRIS (closed, struck off the register, wound up,
dissolved, economically active or inactive)
    - CompanyActivity: The activity of a company
    - RegistrationDate: Date of registration of the company
    - CompanyEndDate: The company end date
    - CompanyEUID: Identification of the company following the BRIS-structure: country code +
register identifier + registration number + verification digit (optional)
    - VatNumber: The VAT registration number of the company
    - CompanyContactData: the contact information of the company (email and Telephone)
    - RegisteredAddress: Links a Legal Entity to its registered address.
    - PostalAddress: Company physical address
    - HasBranch: The branch information
   </xs:documentation>
  </xs:annotation>

  <xs:sequence>
```

```
    <xs:element name="CompanyName" type="NamesType" minOccurs="1" maxOccurs="unbounded"/>
    <xs:element name="CompanyType" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="CompanyStatus" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="CompanyActivity" type="ActivityType" minOccurs="1" maxOccurs="1"/>
    <xs:element name="RegistrationDate" type="xs:date" minOccurs="1" maxOccurs="1"/>
    <xs:element name="CompanyEndDate" type="xs:date" minOccurs="0" maxOccurs="1"/>
    <xs:element name="CompanyEUID" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="VatNumber" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="CompanyContactData" type="ContactPointType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="RegisteredAddress" type="AddressType" minOccurs="1" maxOccurs="unbounded"/>
    <xs:element name="PostalAddress" type="AddressType" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="HasBranch" type="BranchType" minOccurs="0" maxOccurs="1"/>
   </xs:sequence>
  </xs:complexType>

  <xs:complexType name="ContactPointType">
   <xs:annotation>
    <xs:documentation>
     - Email: A valid email address of the company
     - Telephone: Telephone number of the company
    </xs:documentation>
   </xs:annotation>

   <xs:sequence>
    <xs:element name="Email" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="Telephone" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
   </xs:sequence>
  </xs:complexType>

  <xs:complexType name="ActivityType">
   <xs:annotation>
    <xs:documentation>
     - NaceCode: NACE-code of the company's activities
     - ActivityDescription: Description of the activity
    </xs:documentation>
   </xs:annotation>

   <xs:choice>
    <xs:element name="NaceCode" type="xs:string" minOccurs="1" maxOccurs="unbounded"/>
```

```
    <xs:element name="ActivityDescription" type="xs:string" minOccurs="1" maxOccurs="unbounded"/>
   </xs:choice>
  </xs:complexType>

  <xs:complexType name="BranchType">
   <xs:annotation>
    <xs:documentation>
     - BranchName: Primary name of the branch. Can be provided for multiple languages
     - BranchEUID: Identification of the branch of the company following the BRIS-structure: country code + register identifier + registration number + verification digit (optional)
     - BranchActivity: The activity of the branch presented by the NACE code and description
     - BranchRegistredAddress: The legal registered address of the branch
     - BranchPostalAddress: The Physical address of the branch
    </xs:documentation>
   </xs:annotation>

   <xs:sequence>
    <xs:element name="BranchName" type="NamesType" minOccurs="1" maxOccurs="1"/>
    <xs:element name="BranchEUID" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="BranchActivity" type="ActivityType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="BranchRegistredAddress" type="AddressType" minOccurs="1" maxOccurs="1"/>
    <xs:element name="BranchPostalAddress" type="AddressType" minOccurs="0" maxOccurs="1"/>
   </xs:sequence>
  </xs:complexType>

  <xs:complexType name="AddressType">
   <xs:annotation>
    <xs:documentation>
     - PoBox: The Post Office Box number
     - Thoroughfare: The Street name
     - LocationDesignator: House number
     - PostCode:  Postal code / zip code
     - PostName: City
     - AdminUnitL2: Administration unit Level2 - County / region / state
     - AdminUnitL1: Country
    </xs:documentation>
   </xs:annotation>

   <xs:sequence>
    <xs:element name="PoBox" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Thoroughfare" type="xs:string" minOccurs="0" maxOccurs="1"/>
```

```
    <xs:element name="LocationDesignator" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="PostCode" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="PostName" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="AdminUnitL1" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="AdminUnitL2" type="xs:string" minOccurs="0" maxOccurs="1"/>
   </xs:sequence>
   <xs:attribute ref="xml:lang" use="optional"/>
  </xs:complexType>

  <xs:complexType name="NamesType">
   <xs:annotation>
    <xs:documentation>
     - LegalEntityName: Legal name of the company
    </xs:documentation>
   </xs:annotation>
   <xs:sequence>
    <xs:element ref="cvb:LegalEntityLegalName" minOccurs="1" maxOccurs="1"/>
   </xs:sequence>
  </xs:complexType>
</xs:schema>
```

Annex 4 – Member State specific pilot designs

1.1 Austria

1.1.1 Data consumer (pilot scenario DBA1 - USP.gv.at)

1.1.1.1 Pilot scenario description

All details listed in this document are elaborated with the knowledge and current status within the parties involved in Austria in the DE4A project and may change or expand according to new circumstances and/or information.

The following scenario is based on the data consumer workflow:

Initialization:

1) The USP shows the foreign user a new button for the eIDAS/SEMPER login (next to the existing mobile signature login and the USP login). As soon as the foreign user presses this button, an authentication request is created. MOA/ID Austria forwards the authentication request with authorization type to the EGIZ eIDAS Node.

eIDAS Login:

eIDAS Request: The AT eIDAS Node creates a corresponding eIDAS Request with proxy options. In our case "full powers" are requested for a representative relationship between a Natural Person (NP) representing a Legal Person (LP). This eIDAS Request is sent to the foreign eIDAS Node.

eIDAS Response: The foreign eIDAS Node authenticates the user using national systems and verifies that the user fulfills the representation requirements. I.e. that the foreign user is allowed to represent the foreign company. The foreign eIDAS Node sends back an eIDAS Response containing the Minimum Data Set of the representing NP as well as the represented LP. The eIDAS Response includes:

a. MDS of the Natural Person: first name, last name, date of birth, PersonIdentifier.
b. MDS of the Legal Person: LegalName (company name), LegalPersonIdentifier
c. Country of origin

Important Note: It is necessary to agree with the other partners that MDS of the legal person as well as of the natural person will be transferred!

Registration of the NP in the test-ERnP: The AT eIDAS Node registers the foreign NP with its MDS in the test-ERnP and receives the newly generated root number of the NP. Registered are:

a. First name, last name, date of birth of the NP
b. (eIDAS) PersonIdentifier

Registration of the LP in the Test ERsB: The AT eIDAS Node registers the foreign LP with its MDS in the test ERsB and receives the newly generated uuid (Stammzahl) of the LP. This registration explicitly does not specify an authorized representative NP. Registered are:

a. LegalName (company name)
b. (eIDAS) LegalPersonIdentifier

Registration in the test-VDDS: The agency relationship between NP and LP is created in the test-VDDS. For this purpose, the following is transmitted

a. the identifier for the NP from the T-ERnP (vermultich encoded bPK-WT/UR),

b. the uuid (Stammzahl) for the LP from the T-ERsB, and

c. the VDDS power of attorney type for individual power of attorney.

National Response: The EGIZ eIDAS Node sends an authentication response back to USP or MOA/ID Austria. This response contains among others (according to PVP-S profile):

a. For NP
   i. PRINCIPAL-NAME: Last name of the NP
   ii. GIVEN-NAME: first name of the NP
   iii. BIRTHDATE: Date of birth
   iv. BPK: Test BPK for the NP.

b. For LP
   i. MANDATOR-LEGAL-PERSON-SOURCE-PIN-TYPE: Test-bPK for LP corresponding to T-ERsB
   ii. MANDATOR-LEGAL-PERSON-SOURCE-PIN: Trunk number (ordinal number) for the LP.
   iii. MANDATOR-LEGAL-PERSON-FULL-NAME: LegalName/CompanyName via eIDAS

c. Other proxy information
   i. MANDATE-TYPE: MIS Power of Attorney Type
   ii. MANDATE-TYPE-OID: OID of the MIS proxy type
   d. EID-ISSUING-NATION: 2-digit country code.

The same data is also passed to the USP. According to Access Control Mechansimen, the foreign user now has access by proxy for the foreign LP.

Now the address for the user's company should also be requested.

This also requires the eIDAS LegalPersonIdentifier, which is loaded from the ERsB based on the ERsB number.

Additional data (address) can be requested from a DE4A service.

This data (address) is obtained from abroad, and can be appended to the existing ERsB entry by the user after a preview and "OK".

Sample SAML2 assertion of the AT eIDAS Node to MOA-ID.

The following SAML2 assertion shows an example of the PVP2 attributes transferred from the AT eIDAS Node to MOA-ID in the case of an eIDAS registration on behalf of a legal entity. The assertion transmitted by MOA-ID to the service provider (USP) is identical to the assertion shown below with regard to the maximum available attribute set.

```
<?xml version="1.0" encoding="UTF-8"?>
<saml2p:Response xmlns:saml2p="urn:oasis:names:tc:SAML:2.0:protocol" xmlns:xs="http://www.w3.org/2001/XMLSchema"
    Destination="https://localhost/authhandler/public/secure/eidas/post" InResponseTo="_aeebfae3ce681fe3ddcaf213a42f01d3" IssueInstant="2014-03-05T06:39:51.017Z" Version="2.0">
 <saml2:Issuer xmlns:saml2="urn:oasis:names:tc:SAML:2.0:assertion"
     Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity">https://vidp.gv.at/ms_connector/pvp/metadata</saml2:Issuer>
 <saml2p:Status>
  <saml2p:StatusCode Value="urn:oasis:names:tc:SAML:2.0:status:Success"/>
 </saml2p:Status>
 <saml2:Assertion xmlns:saml2="urn:oasis:names:tc:SAML:2.0:assertion" ID="_602c3236bffaf71ac3ac88674e76ff9f" IssueInstant="2014-03-05T06:39:51.017Z" Version="2.0">
  <saml2:Issuer Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity">https://vidp.gv.at/ms_connector/pvp/metadata</saml2:Issuer>
  <saml2:Subject>
   <saml2:NameID Format="urn:oasis:names:tc:SAML:2.0:nameid-format:persistent"
     NameQualifier="urn:publicid:gv.at:cdid+BF">QVGm48cqcM4UcyhDTNGYmVdrIoY=</saml2:NameID>
   <saml2:SubjectConfirmation Method="urn:oasis:names:tc:SAML:2.0:cm:bearer">
    <saml2:SubjectConfirmationData InResponseTo="_aeebfae3ce681fe3ddcaf213a42f01d3" NotOnOrAfter="2014-03-05T06:44:51.017Z"
      Recipient="https://localhost/authhandler/public/secure/eidas/post"/>
   </saml2:SubjectConfirmation>
  </saml2:Subject>
  <saml2:Conditions NotBefore="2014-03-05T06:39:51.017Z" NotOnOrAfter="2014-03-05T06:44:51.017Z">
   <saml2:AudienceRestriction>
    <saml2:Audience>https://localhost/authhandler/restricted/eidas/metadata</saml2:Audience>
   </saml2:AudienceRestriction>
  </saml2:Conditions>
  <saml2:AuthnStatement AuthnInstant="2014-03-05T06:39:51.017Z" SessionIndex="_c0c683509a8ff6ac372a9cf9c5c5a406">
   <saml2:AuthnContext>
    <saml2:AuthnContextClassRef>http://eidas.europa.eu/LoA/high</saml2:AuthnContextClassRef>
   </saml2:AuthnContext>
  </saml2:AuthnStatement>
  <saml2:AttributeStatement>
   <saml2:Attribute FriendlyName="PVP-VERSION" Name="urn:oid:1.2.40.0.10.2.1.1.261.10" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">2.1</saml2:AttributeValue>
   </saml2:Attribute>

   <saml2:Attribute FriendlyName="EID-CITIZEN-QAA- EIDAS-LEVEL" Name="urn:oid:1.2.40.0.10.2.1.1.261.108" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">http://eidas.europa.eu/LoA/high</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="EID-ISSUING-NATION" Name="urn:oid:1.2.40.0.10.2.1.1.261.32" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">NL</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="PRINCIPAL-NAME" Name="urn:oid:1.2.40.0.10.2.1.1.261.20" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">Mustermann</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="GIVEN-NAME" Name="urn:oid:2.5.4.42" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">Max</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="BIRTHDATE" Name="urn:oid:1.2.40.0.10.2.1.1.55" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">1940-01-01</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="BPK" Name="urn:oid:1.2.40.0.10.2.1.1.149" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">BF:QVGm48cqcM4UcyhDTNGYmVdrIoY=</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="EID-SECTOR-FOR-IDENTIFIER" Name="urn:oid:1.2.40.0.10.2.1.1.261.34" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">urn:publicid:gv.at:cdid+BF</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="MANDATE-TYPE" Name="urn:oid:1.2.40.0.10.2.1.1.261.68" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">Generalvollmacht</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="MANDATOR-LEGAL-PERSON-SOURCE-PIN" Name="urn:oid:1.2.40.0.10.2.1.1.261.100"
     NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">999999m</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="MANDATOR-LEGAL-PERSON-SOURCE-PIN-TYPE" Name="urn:oid:1.2.40.0.10.2.1.1.261.76"
     NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">urn:publicid:gv.at:baseid+XERSB</saml2:AttributeValue>
   </saml2:Attribute>
   <saml2:Attribute FriendlyName="MANDATOR-LEGAL-PERSON-FULL-NAME" Name="urn:oid:1.2.40.0.10.2.1.1.261.84"
     NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:uri">
    <saml2:AttributeValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">Testfirma</saml2:AttributeValue>
   </saml2:Attribute>
  </saml2:AttributeStatement>
 </saml2:Assertion>
</saml2p:Response>
```

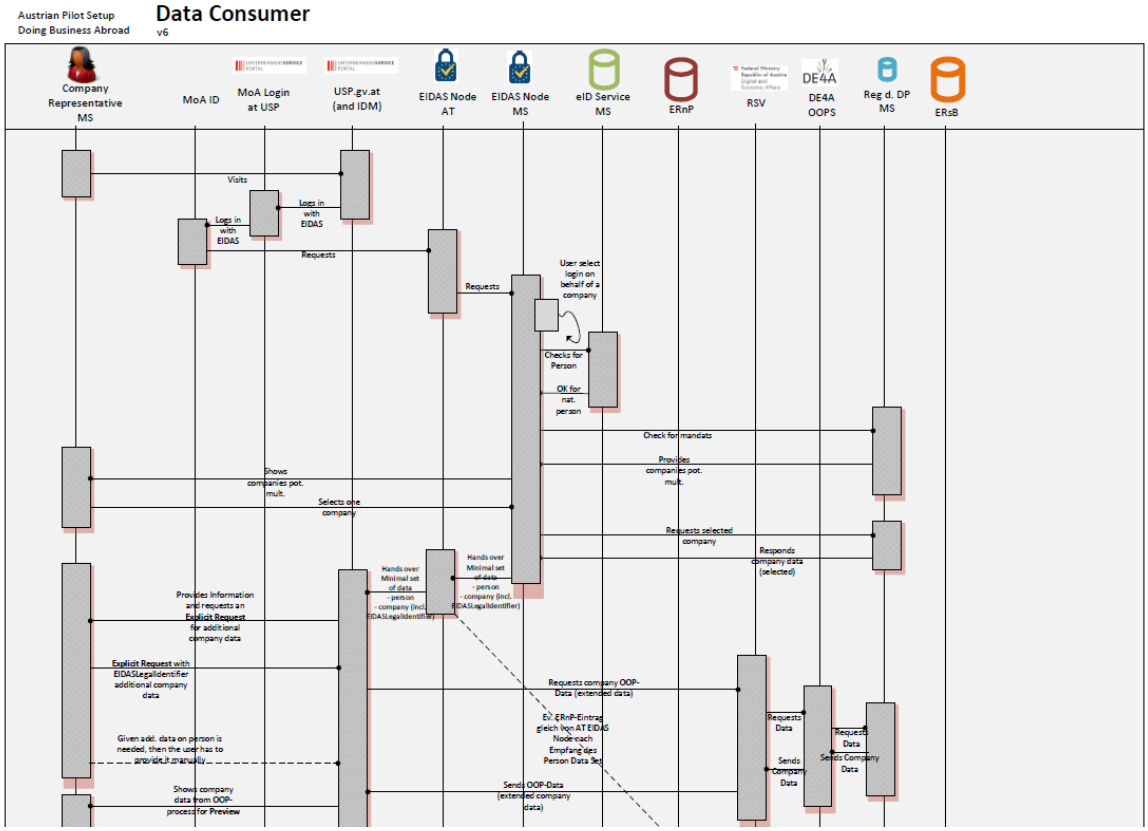
Roles:

Table 139: AT case: Roles

MS	Role	Organization
AT	Data evaluator	Registry ERsB (Statistik Austria) for non natural persons Registry ERnP (BMI) for natural persons Data processing at registries: BRZ for the entries in the registers USP.gv.at is also involved in the Data Evaluator process ADO (Austrian DE4A Orchestrator) RSV (Austrian Data Hub) (optional)
	Data requestor	Business Portal USP.gv.at (BMDW) via the Austrian data infrastructure RSV (BMDW) connected to the Austrian DE4A/ADO/OOP-Node

1.1.1.2 Process design

Visual representation:



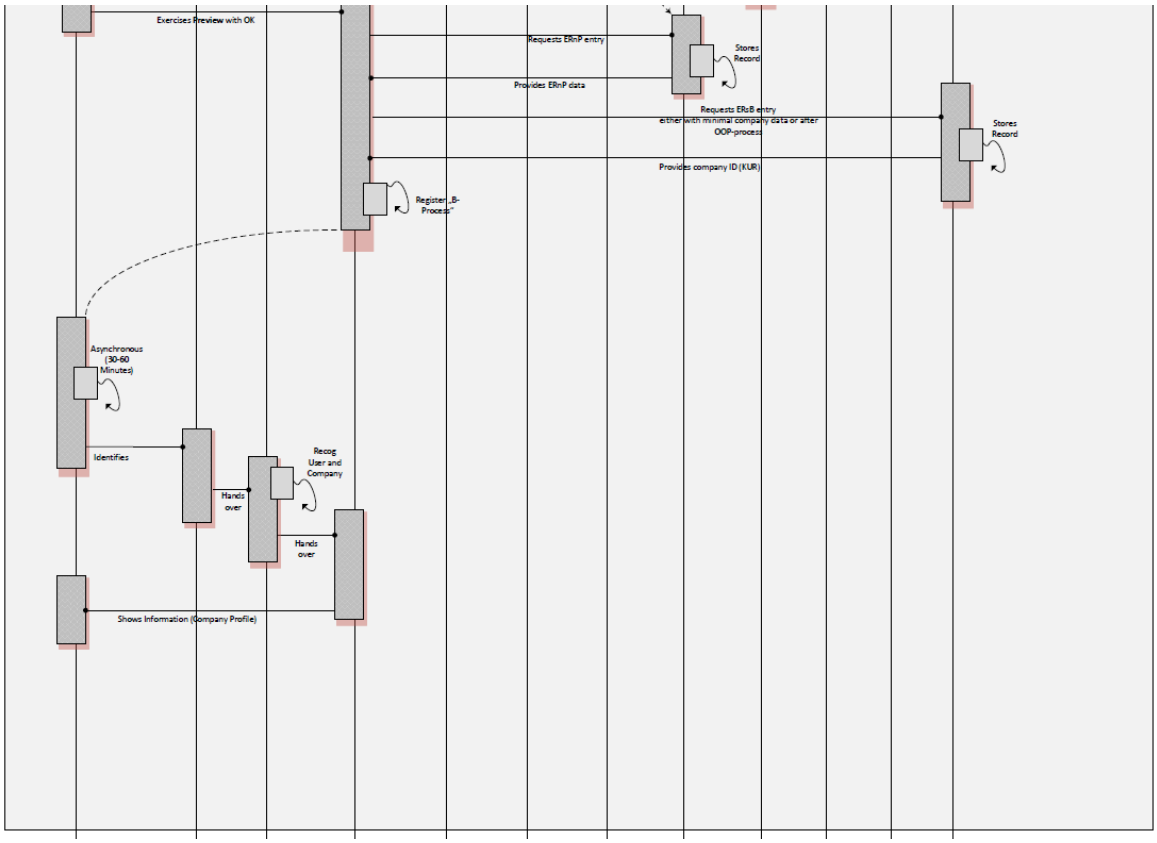


Figure 31: AT case. DC scenario

Description of process steps:

Table 140: AT case: Process steps

Role	Process step	Description
User	Visits USP.gv.at	Start of process for registering in USP.gv.at as a foreign company A foreign user visits the Austrian business portal USP.gv.at Restrictions for first iteration: Only Company Representatives with full power and one existing company In the second iteration it is intended to use SEMPER solution or similar mandate definition
User	Request authentication	User follows the identification at USP.gv.at via EIDAS
Data Requestor	offers EIDAS authentication	USP.gv.at hands over to the Austrian authentication mechanisms, which finally offers the eIDAS Node AT (for the pilot)
User		Foreign User identifies himself at USP.gv.at via Austrian eIDAS Node
EIDAS Node AT	Hands over request	The Austrian eIDAS Node hands over the authentication request from the foreign User to the foreign eIDAS Node

Role	Process step	Description
EIDAS Node MS	Identification process	eIDAS Node MS offers the functionality of Identification on behalf of a company
User	Provide authentication details	Foreign User chooses the identification on behalf of a company, he includes identifying details and selects the company and optionally selecting the mandate to use (member state specific).
Foreign IDM	Establish user identity	Matches the eIDAS authentication of the natural person and the mandate and is granting access for the user based on powers validation
EIDAS Node MS	Creating Minimal Data Sets for natural person and legal person	Hands over the two MDS to the eIDAS Node AT
EIDAS Node AT	MDS handling	eIDAS Node AT receives the two MDS to the USP.gv.at
Data Requestor	Starts OOP process	The Data Requestor stores the MDS and starts the OOP-process for additional data on the company
Data Requestor	Explicit Request	The Data Requestor offers the functionality the Explicit Request
User	Explicit Request	The User is exercising the Explicit Request at the Data Requestor
Data Requestor	Explicit Request	The Data Requestor formulates an official request for the OOP process (company data)
Data Requestor	Request	The Data Requestor sends the request to the Austrian data infrastructure Austrian data hub (RSV) (as part of the Data Requestor system compound - see definition above)
Data Requestor	Request	Austrian Data hub (RSV) is mapping the data request to the canonical evidence format and data field definition
Data Requestor	Request	RSV sends the data request (now following canonical evidence format and data field definition) to the Austrian DE4A/OOP-node
DE4A/OOP-Node	Request	The Node takes over the AT request and follows the 4 corner model architecture communication (MS1, Gateway MS1, Gateway MS2, MS2)
Data Requestor	(If necessary) Natural Person Data	It could be that additional person data (add on MDS) is necessary for entry of person in ERnP, so the Data Requestor offers the User a functionality for adding this additional data
DE4A/OOP-Node	Response	DE4A/OOP-Node in Austria receives data response (in canonical evidence format) from foreign Gateway
DE4A/OOP Node	Response	DE4A/OOP-Note in Austria sends data response to the RSV

Role	Process step	Description
Data Requestor	Response	RSV is mapping the data response from the canonical evidence format and data field definition to the Austrian format and data field definition
Data Requestor	Response	RSV sends the data to the USP.gv.at
Data Requestor	Response	USP.gv.at takes over the data
Data Evaluator	Registration	USP.gv.at starts the process of entering the data in the Data Evaluator (registries)
Data Evaluator	Data entry	The Data Evaluator stores the data for natural person and legal person
Data Evaluator	Data processing	The Data Evaluator ERsB sends credentials to USP.gv.at
Business Portal	Starts registration process	The USP.gv.at receives the credentials from Data Evaluator ERsB and starts the registration process of the foreign company and his full power mandated person
Business Portal	Registration process	The USP.gv.at registers the foreign company and his full power mandated person and hands over the credentials for login and using USP.gv.at

1.1.1.3 Wireframes

1. **Go to usp.gv.at**

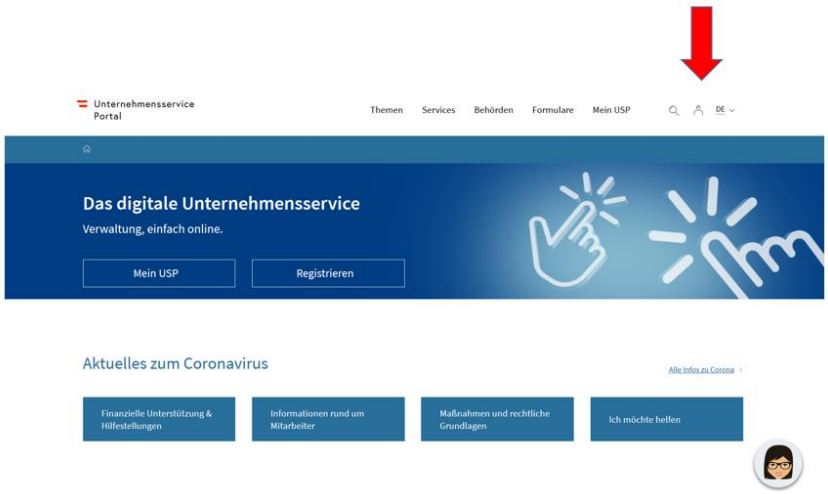


Figure 32: AT example. Ups.gv.at screen

2. Go to De4A Partner Login

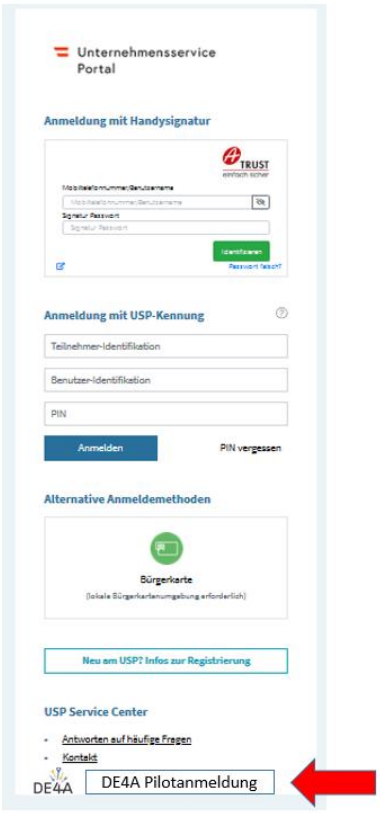


Figure 33: AT example. DE4A login screen

3. Select your country

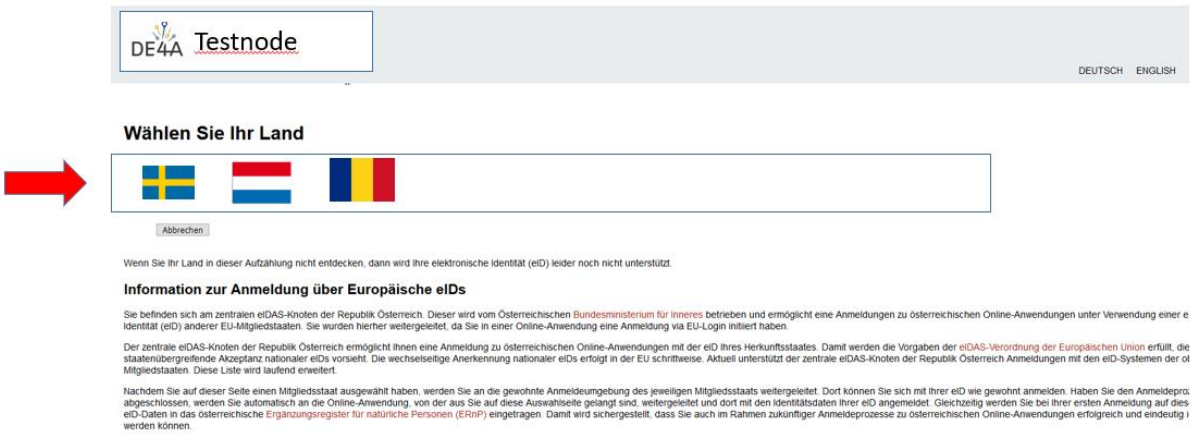


Figure 34: AT example. Country selection screen

4. Login in wich eIDAS

Figure 35: AT example. eIDAS login screen

5. Explicit Request

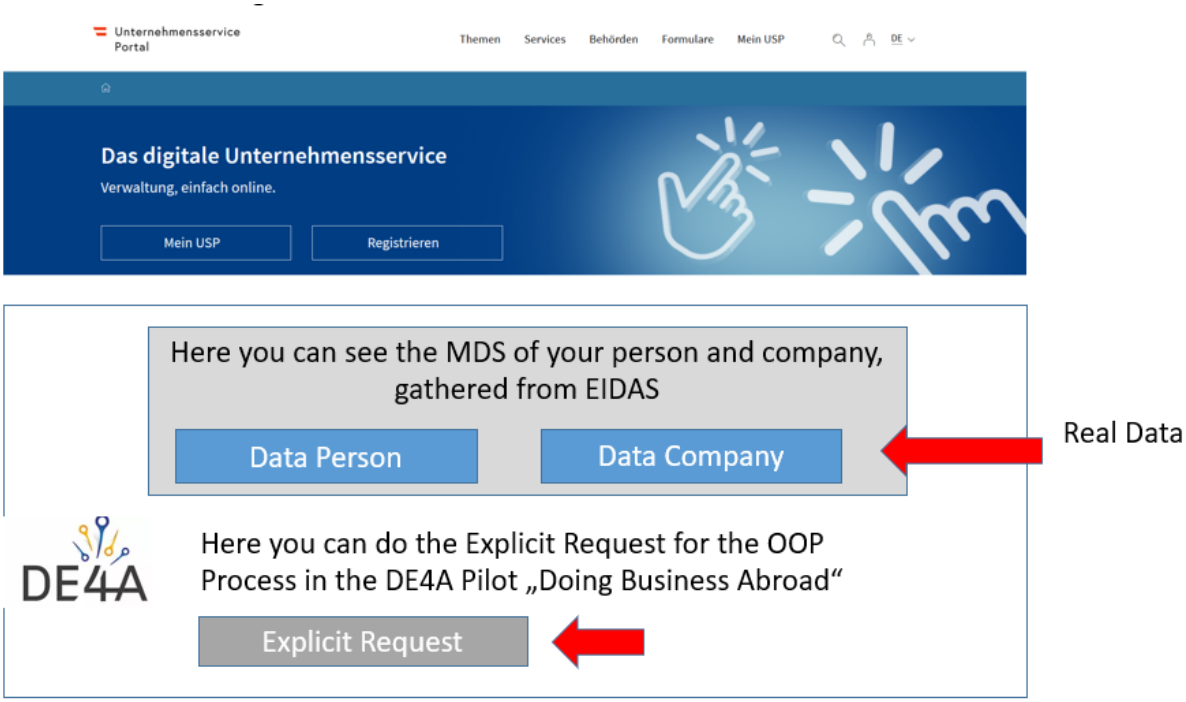


Figure 36: AT example. Explicit request screen

6. Canonical Evidence Mapping

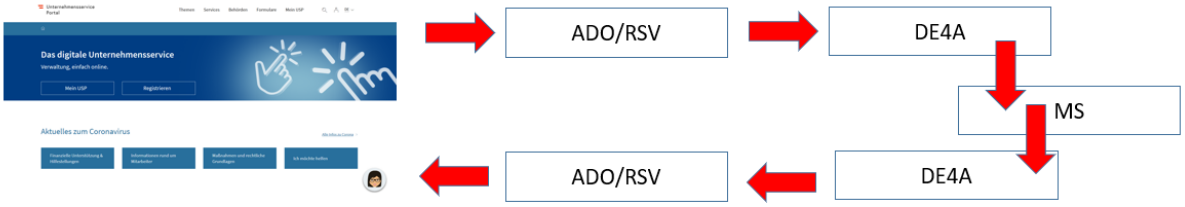
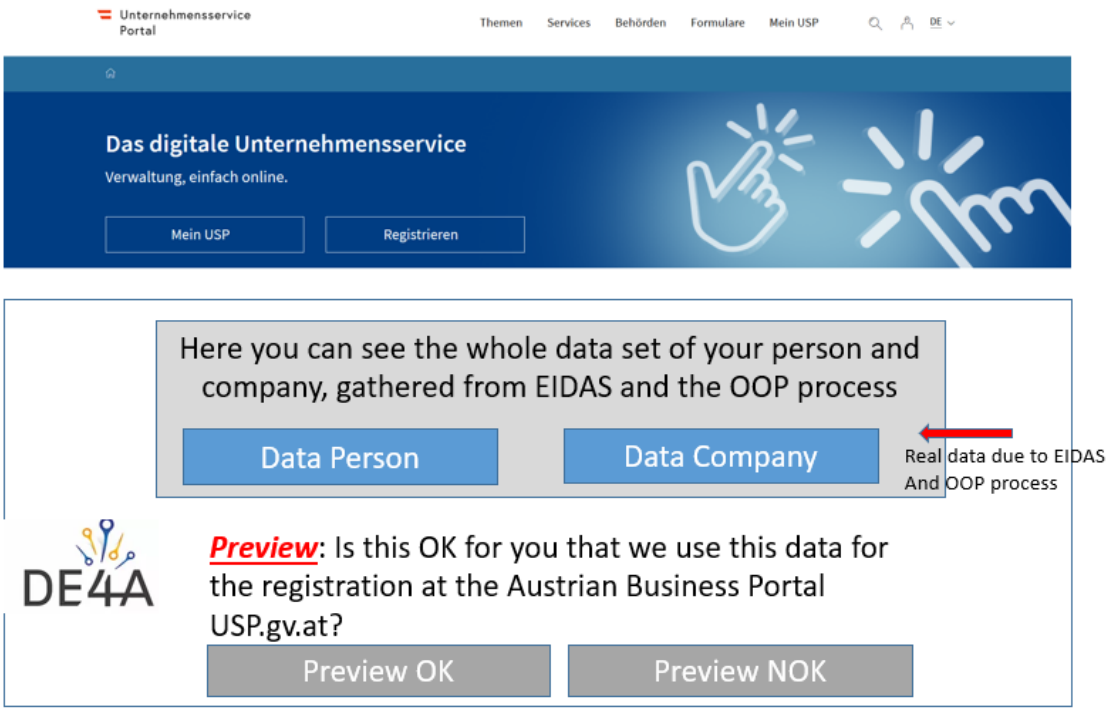


Figure 37: AT example. Canonical evidence mapping

7. Preview



If NOK, then all data is deleted, and registration process in usp.gv.at is terminated.
If OK, then next step.

Figure 38: AT example. Preview screen

8. **Entry in the registry**

Figure 39: AT example. Registry screen

9. **End of registration process (we assume this will be the case, but this is subject to change)**

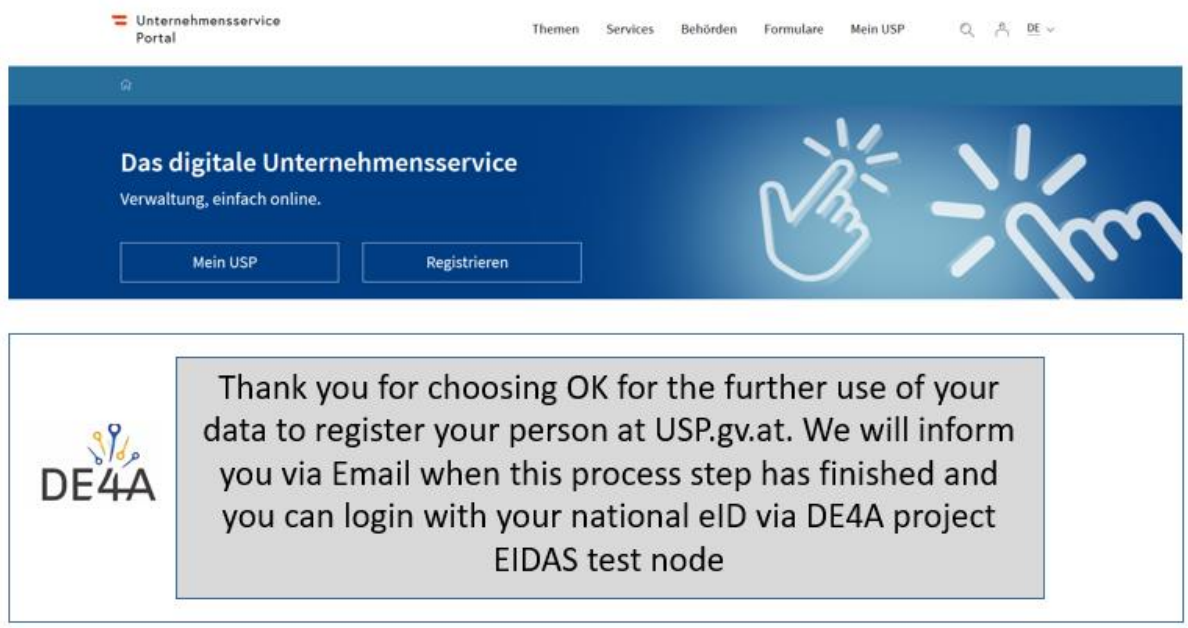


Figure 40: AT example. End registration screen

1.1.1.4 Solution architecture

Visual representation:

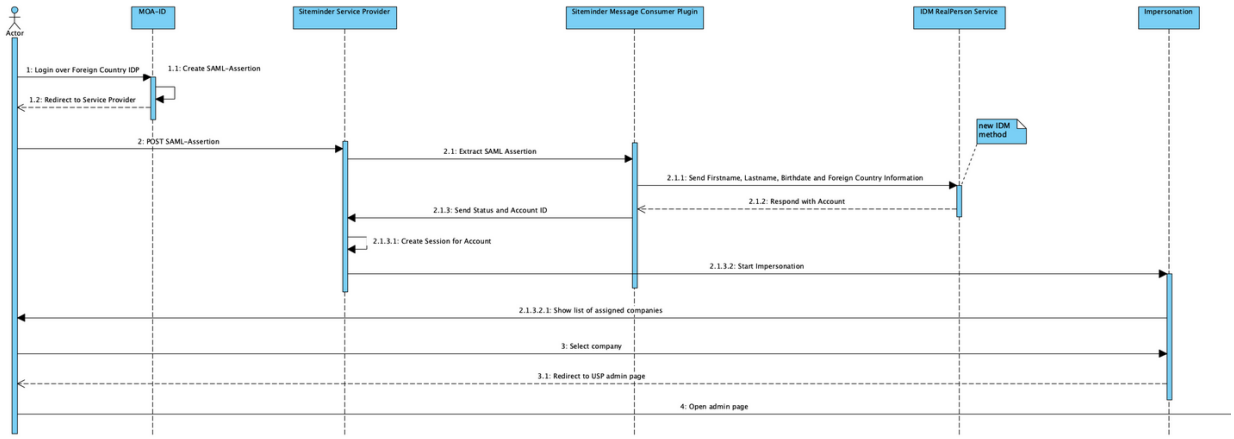


Figure 41: AT case. Solution architecture process

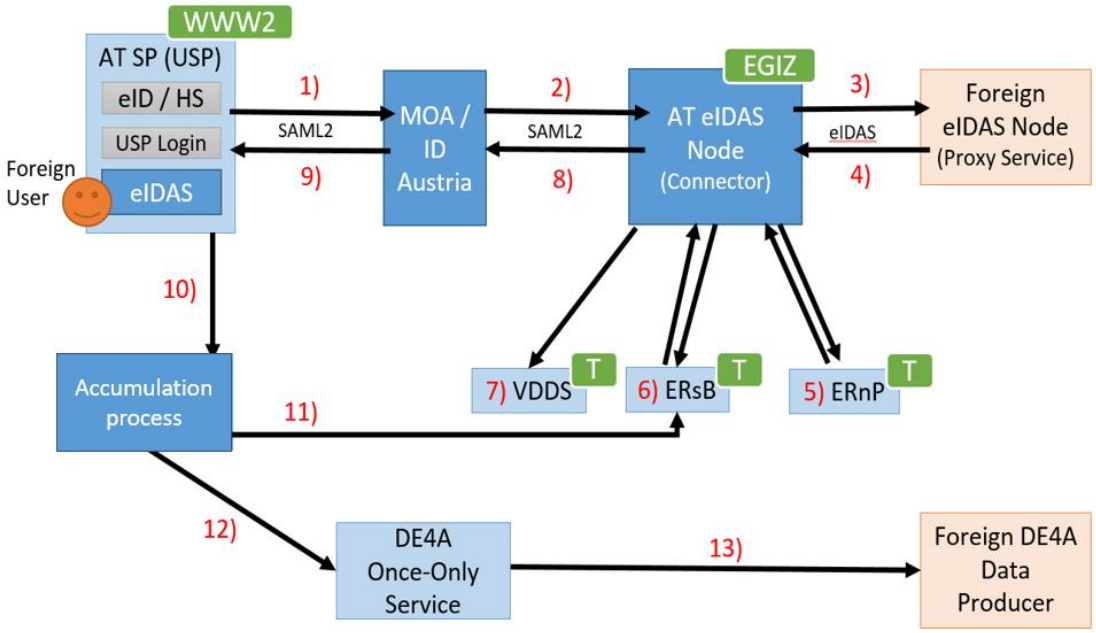


Figure 42: AT case. Solution architecture flow

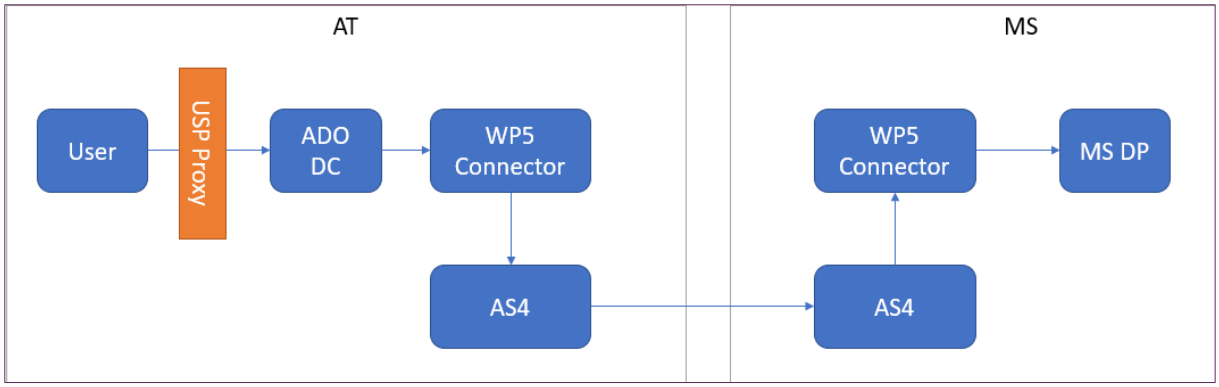


Figure 43: AT case. Solution architecture, DC components relation

Mapping of MS applications on PSA reference architecture

Table 141: AT case: DC Scenario applications

Application collaboration	Application component	Application service	Application x	Application y…
eProcedure portal	eProcedure Portal front end	eProcedure initiation Identification and hand over to EIDAS Node AT Explicit request Facultative additional data entry of natural person Company Registration process Registration confirmation Registration termination	USP.gv.at	Data entry to ERnP and ERsB (registries)
	Session management	eProcedure save and resume	USP.gv.at	ADO
	eProcedure rules engine	Procedural requirements determination Requirements/evidence matching (to and from canonical evidence)	USP.gv.at	ADO
	Logging/Archiving	All services	ZLOG	
Information desk	Evidence type translator	Cross-border evidence matching		
	Evidence Map Editor			
	Data service lookup	Inquire routing information		
	Service registry editor			
	Authorization controller	Authority check Legal basis check		
	Authorities editor			

Application collaboration	Application component	Application service	Application x	Application y…
	Equivalent evidence			
	Evidence Map			
	Competent authorities			
Evidence Interchange Management	Evidence interchange front-end	Evidence status overview Evidence preview		
	Evidence interchange back-end	Evidence status tracker (2x) Evidence shredder		
Trust Architecture	Trust Service Provisioning Component	e-Signature Creation Service e-Signature Verification and Validation Service		
	Identity Management Component	Authentication initiation User Authentication (UI)	EIDAS Nodes (AT and foreign)	
	Record matching	Identity/record matching	Foreign EIDAS Node hands over MDS to EIDAS Node AT	
	Data encryption/decryption	Message encryption Message decryption		
	Mandates/powers	TBD in context of DBA pilot	EIDAS Node	Business Registry
Data logistics	Data Exchange Component	Data Exchange Service		
	Data Exchange gateway			

Description of existing MS application components to be used in the DBA-pilot:

Table 142: AT case: DC Scenario existing components

Application	Description
USP.gv.at	Austrian eGovernment Business Portal
Identity Management System	Austrian Identity Management System as part of the USP.gv.at
Access Management System	Austrian Access Management System as part of the USP.gv.at
RSV	Austrian Data Exchange Infrastructure
ERnP	Supplementary registry for natural persons

Application	Description
ERsB	Supplementary registry for legal persons

Description of new MS application components to be used in the DBA-pilot:

Table 143: AT case: DC Scenario new components

Application	Description
EIDAS Node	Austrian EIDAS Node at USP.gv.at
RSV	Pilot specific Exchange and data management
ADO	Austrian DE4A Orchestrator - pilot specific orchestration service

Design choices

Table 144: AT case: DC Scenario design choices

#	Application component	Design choice	Motivation
1	All changes in Austrian System for the DBA pilot (as Data Consumer) has to follow the capabilities and legal possibilities of Austrian administration.	Best Effort	Legal obligations and technical capabilities
2	Canonical Evidence: Mapping of national company data evidence will take place on the data owner side ADO/RSV or USP → depending on requirements of 5.3), OOP process.	eIDAS Semper Node of Semper project will be used and adapted for first iteration.	Semper for later iterations
2	Canonical Evidence	Mapping of national company data evidence will take place on the data owner side (ADO/RSV or USP → depending on requirements of 5.3), OOP process.	Constraints according to D5.3
3	Full Powers	usp.gv.at registers new full powers companies	Technical Constraints
4	Gateway	AT will use the AS4 gateway integrated in the DE4A connector. No separate AS4 gateway will be connected and used. Client = phase 4	
5	Open Source	All components are based on Open Source.	

1.1.1.5 Gap Analysis

Service provider components

Table 145: AT case: DC Scenario SP components

Application component	Change description	Change owner	Precondition
USP.gv.at	Explicit Request Functionality	BRZ/BMDW	Technical capability
USP.gv.at	OOP Request	BRZ/BMDW	Technical capability
USP.gv.at	Request Management for EIDAS Node and RSV	BRZ/BMDW	Technical capability
USP.gv.at	Response Management for EIDAS Node and RSV	BRZ/BMDW	Technical capability
USP.gv.at	Preview	BRZ/BMDW	Technical capability

National components

Application component	Change description	Change owner	Precondition
RSV	OOP Request and Response management	BRZ/BMDW	Technical capability
RSV	Data management	BRZ/BMDW	Technical capability
RSV	Interfaces	BRZ/BMDW	Technical capability
EIDAS Node	Implementation of Austrian EIDAS node for the pilot	BRZ/BMDW	Technical capability
EIDAS Node	Pilot specific adaptations	BRZ/BMDW	Technical capability
ADO	Austrian DE4A Orchestrator - pilot specific orchestration service	BRZ/BMDW	Austrian DE4A Orchestrator - pilot specific orchestration service

1.1.2 Data provider

1.1.2.1 Process design

Visual representation:

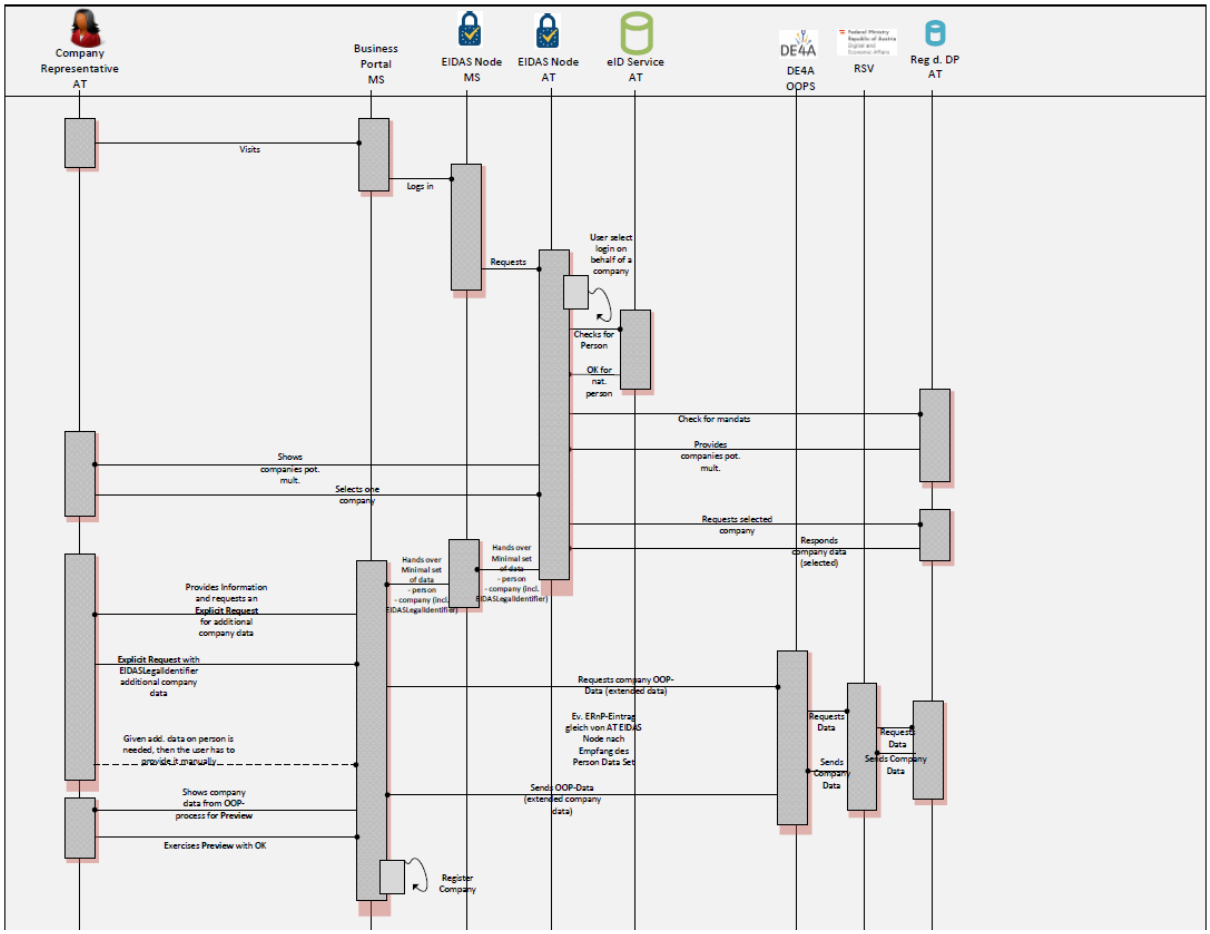


Figure 44: AT case. DP scenario

Description of process steps of AT as Data Provider:

Table 146: AT case: DP Scenario process

Role	Process step	Description
EIDAS Node AT	Request	EIDAS Node AT receives request from foreign EIDAS Node
EIDAS Node AT	Authentication	*EIDAS Node AT authenticates the natural person via the Austrian eID system (Handy Signature or new: ID Austria)*
EIDAS Node AT	Mandates	EIDAS Node AT authenticates the mandate of the natural person to a regarding legal person ▸ First iteration: Only persons with full power mandate and only own business are allowed ▸ Second iteration: SEMPER integration is intended The mandate is cleared at and provided from Business Registry (UR) and USP.gv.at
EIDAS Node AT	Response	EIDAS Node AT sends two MDS to foreign EIDAS Node

Role	Process step	Description
Data Transferor	Request	ADO takes over request (in canonical evidence format and data field definition) from DE4A/OOP Node
Data Transferor	Request	ADO mapps from canonical evidence format and data field definition to the Austrian format and data field definition
Data Transferor	Request	ADO sends request to the Data Owner
Data Owner	Request	UR/USP.gv.at (Data Owner) receives request
tbd	ID Matching	Re-Establishment of the ID of the Person???
Data Owner	Data Management	*UR/USP.gv.at fetches data on company requested*
Data Owner	Response	*UR/USP.gv.at sends the response to Data Transferor*
Data Transferor	Response	*Data Transferor mapps the data in the format and data field definition of the canonical evidence*
Data Transferor	Response	*Data Transferor sends data to the DE4A/OOP-Node*
tbd	Re-establish user identity	*Should be interpreted as: check whether the company identifier can be recognized by the data owner.*

1.1.2.2 Solution architecture

Visual representation:

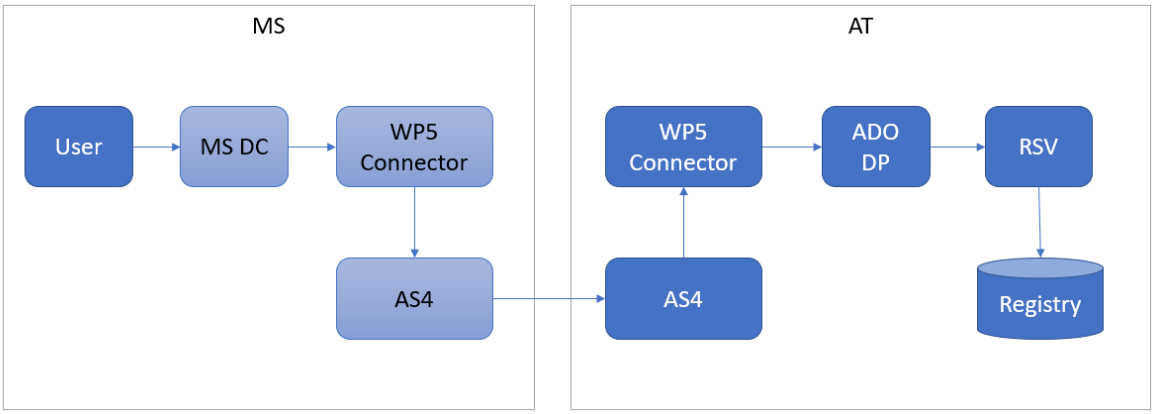


Figure 45: AT case. Solution architecture, DP components relation

Mapping of MS applications on PSA reference architecture

Table 147: AT case: DP Scenario applications

Application collaboration	Application component	Application service	Application x	Application y…
eProcedure portal	Logging/Archiving	All AT services	ZLOG	

Application collaboration	Application component	Application service	Application x	Application y…
Information desk	Authorization controller	▸ Authority check ▸ Legal basis check		
Trust Architecture	Trust Service Provisioning Component	▸ e-Signature Creation Service ▸ e-Signature Verification and Validation Service		
	Record matching	Identity/record matching	EIDAS Node	Identity Management AT
	Data encryption/decryption	▸ Message encryption ▸ Message decryption		
Data logistics	Data Exchange Component	Data Exchange Service	RSV	
	Data Exchange gateway			
Evidence retrieval	Evidence query	Evidence lookup	USP.gv.at	IDM
	Evidence editor			
	Evidence query to portal			
Evidence portal	Evidence portal back-end	Data Exchange Service	Business Registry	

Description of existing MS application components to be used in the DBA-pilot:

Table 148: AT case: DP Scenario existing components

Application	Description
RSV	Austrian Data Exchange Infrastructure
UR	Austrian Business Registry
USP.gv.at	Austrian eGovernment Business Portal
EIDAS Node AT	Austrian EIDAS Node
Identity Provider AT	Austrian Identity Provider (Handysignature/Bürgerkarte, new: ID Austria)

Description of new MS application components to be used in the DBA-pilot:

Table 149: AT case: DP Scenario new components

Application	Description
EIDAS Node AT	Integrated for the pilot and with the respective functionality (Authentication of Natural Person and mandats check for Legal Person)
RSV	Pilot specific Exchange and data management with UR/USP.gv.at
UR/USP.gv.at	Exchange Management with RSV

Design choices

Table 150: AT case: DP Scenario design choices

#	Application component	Design choice	Motivation
1	All changes in Austrian System for the DBA pilot (as Data Provider) has to follow the capabilities and legal possibilities of Austrian administration.	Best Effort	Legal obligations and technical capabilities

1.1.2.3 Gap analysis

Service provider components

Table 151: AT case: DP Scenario SP components

Application component	Change description	Change owner	Precondition
USP.gv.at	Data extraction functionality	BRZ/BMDW	Technical capability
USP.gv.at	Exchange capability with RSV	BRZ/BMDW	Technical capability
UR	Data extraction functionality	BRZ/BMDW	Technical capability
UR	Exchange capability with RSV	BRZ/BMDW	Technical capability

National components

Table 152: AT case: DP Scenario National components

Application component	Change description	Change owner	Precondition
RSV	OOP Request and Response management	BRZ/BMDW	Technical capability
RSV	Data management	BRZ/BMDW	Technical capability
RSV	Interfaces	BRZ/BMDW	Technical capability
EIDAS Node	Implementation of Austrian EIDAS node for the pilot	BRZ/BMDW	Technical capability
EIDAS Node	Pilot specific adaptations	BRZ/BMDW	Technical capability

1.2 The Netherlands

1.2.1 Data consumer (pilot scenario DBA4: MijnRVO.nl)

1.2.1.1 Pilot scenario description

Overview:

RVO carries out several services for companies (e.g. regulations) that are not restricted to Dutch companies. In order to qualify for the service, the company must provide the necessary data. Besides the specific data required to qualify for the service, RVO also requires general data of the

company itself, for identification, communication and compliance purposes. RVO stores this company data in a central ('customer') registry that is used for most RVO services. This scenario entails a non-Dutch company that applies for a service carried out by RVO.nl. In this process, the company does not have to supply information to RVO that is already known to the data provider in a Member State (the 'native' country of the business). RVO.nl is able to retrieve this information from the data provider. It will do so by implementing the Intermediation pattern as defined in the project start architecture of the DE4A project. Keeping this information up to date is out of scope for the intermediation pattern but will be part of the implementation of the subscription and notification interaction pattern (later in 2021/2022).

Online procedures:

In this pilot, the registration of the company at rvo.nl, using data from a Member State data provider, is realized. The registration of the company is the first step of:

The service to get permission for exercising a business activity

The services that are part of the Service Directive

Data:

The evidence exchanged is the 'DBA company data'-evidence, as described in the paper on the DBA data-model. A draft version is available and needs to be reviewed and mapped to the RVO attributes. This evidence comprises all attributes necessary for the company registration.

Roles:

Table 153: NL case: DC Scenario roles

MS	Role[46]	Organization
NL	Data evaluator	RVO
	Data requestor	RVO

1.2.1.2 Process design

Visual representation:

The process to be piloted matches the intermediation pattern's reference process – business process collaboration as described and visualized in the PSA. Please see the PSA for a visual representation.

Description of process steps:

[46] Roles: Data Evaluator (DE) is any organization authorized to receive and process data from the User (citizen or business), via the OO TS. In t=2 this is the final Public Service Provider. Data Requestor (DR) is the role making search and request for data possible in terms of technology. If the DR is a separate entity, they carry out the request under the mandate of the DE. Data Owner (DO) is any organization owning information about the User (citizens or businesses), a base registry or a secondary registry that might be necessary for another organization to exercise their competencies. It is responsible of authorization approval, data extraction and audit control. Data Transferor (DT) is technically responsible for the actual data transmission. They operate the Data Service, exposing the data in the OO TS. In some cases, DO and DT are both the same actor/organisation, but they can also be different entities. The second is always the case when a national or sectoral intermediary is acting as an evidence broker.

Table 154: NL case: DC Scenario process

Role	Organization	Process step	Description	Application collaboration	Wireframe
User		Request or resume public service	User requests access to login protected mijn.rvo.nl pages https://mijn.rvo.nl to be able to apply for services: https://mijn.rvo.nl/login. The pilot login will be integrated in (not separated from), the main login page.	eProcedure Portal	1
Data evaluator	RVO	Request authentication	Portal https://mijn.rvo.nl sends authentication request including company identification attributes ("legal person attributes" in eIDAS: eIDASLegalPersonIdentifier and eIDASLegalName) to Dutch eIDAS-node.	eProcedure Portal Trust architecture – eIDAS-node	
User		Provide authentication details[47]	User chooses to authenticate via eIDAS (authentication via national eID is not part of the pilot) and provides login credentials. This includes identifying the company and optionally selecting the mandate to use (Member State specific). Note that in the first pilot iteration only full powers will be used and the SEMPER-extension is not needed. The SEMPER-extension will be used in later phase of the pilot.	trust architecture – eIDAS-node	2, 3a, 3b
Data evaluator	RVO	Establish user identity	RvO receives authentication details and checks if the received company identifier (eIDASLegalPersonIdentifier) is already present in the RvO register: process 'SelecteerRelatie/ S01' (additional steps may be required) Authentication details to receive: ▸ pseudo or pseudoID from eHerkenning (pseudonym of natural person ID from eHerkenning) ▸ eIDASLegalPersonIdentifier	eProcedure Portal Trust architecture – eIDAS-node	4 (company already known)

[47] This is an uninterrupted process; see design choices. User has to be informed if a retry of the process is recommended or not. This can be recommended if the DP country needs time to prepare the validation of powers. A solution for this scenario is needed, either on DC- or on DP-side.

			▸ eIDASLegalName The pseudo/pseudo ID will be ignored by RVO. If the company is already registered, the company is successfully logged in and can continue applying for a service. If not, the process is continued. It is possible that a accompany is registered at RVO, but without the LegalPersonIdentifier, meaning it will not be found and could be registered again. A solution for this is under consideration and will be implemented in the pilot.		
Data evaluator	RVO	Redirect user to another channel	If the authentication and/or powers validation failed RVO terminates the process and presents an information page with alternative options to the user.	eProcedure Portal	5
User		Abort eProcedure	User chooses to terminate the procedure and returns to the portal: www.rvo.nl .	eProcedure Portal	6
Data evaluator	RVO	Determine procedural requirements	This will be a pre-defined set of checks that RVO will apply to the company data to receive, e.g. the company must be 'active'. No rule-base or whatsoever will be used for this in the pilot.	eProcedure Portal	
User		Request OOP transfer of evidence[48]	User is asked to explicitly request the usage of the OOP TS to retrieve evidence from the home country , reads the presented information on the explicit request form and: ▸ decides to explicitly request the evidence via the OOP TS ▸ aborts the process: This means that the user cannot request the desired service. RVO will present the user an alternative procedure to do the company registration. This	eProcedure Portal	7

[48] It is recommended to ask the user to agree to participate in the pilot as long as the SDG is not yet in effect; the user needs to be aware of the legal basis of the explicit request.

			alternative procedure is not part of the pilot. The SDGR defines some exceptions to the need for the user's explicit request. These exceptions will not be implemented in the pilot to reduce complexity and improve user experience. The user is always asked to make an explicit request.		
Data evaluator	RVO	Determine required cross-border evidence	RVO decides on which company data to request from other Member State (depends on the outcome of the DBA data model; presumably only the 'DBA company data'-evidence has to be requested) and sends the requests for the required evidence to the data requestor. ▸ Please note, in requesting the evidence MijnRVO.nl will interact with the OOP TS to: ▸ Identify RVO (authentication, expectedly using PKI certificates) ▸ Find the data provider to contact. ▸ Retrieve the technical contact details of the data provider. ▸ Send an evidence request. Working assumption for now is that RVO needs to identify against the OOP TS (NL implementation of eDelivery) only. The national eDelivery nodes validate the identity of the eDelivery counter parts in the other Member State and the data provider identifies against the DP eDelivery only.	eProcedure Portal	
Data requestor	RVO	Lookup routing information	In this process RVO will find the data provider to contact and retrieve the technical contact details of the data provider	Information Desk	
Data requestor	RVO	Request evidence	In this process RVO will send the evidence request to the data provider using the AS4 eDelivery protocol.	Data logistics Trust architecture	

Data requestor	RVO	Establish non availability of OOP	In case the OOP TS is offline, the company cannot be recognized by the DP, there is a time-out in retrieving evidence or the evidence is not available. The data requestor communicates this to the data evaluator (both roles to be implemented by RVO in the pilot).	Evidence exchange management	
Data evaluator	RVO	Update evidence status	If the exchange was successful the user is forwarded to 'forward evidence' and the process continues with the exchange of evidence from the DP-country.	Evidence interchange back-end	
User		Follow evidence status	If the evidence exchange failed the user is informed and the evidence-exchange-process is terminated. The user is also informed on the reason of the failed exchange, so the user knows if a retry could lead to a successful exchange. Possible reasons: ▸ the OOP TS is offline ▸ the company cannot be recognized by the DP ▸ there is a time-out in retrieving evidence ▸ the evidence is not available. Help/Contact information will be provided.	eProcedure Portal Note that not the Evidence Interchange Management – front end is used. This deviates from the PSA Process realization, see design choices for explanation.	(8)
Data requestor	RVO	Forward evidence	The data requestor sends the retrieved evidence (company data) to the Data Evaluator. As in the RVO-case both roles will be implemented by RVO itself, this is a system-internal step.	Evidence exchange management Data logistics Trust architecture	

Data evaluator	RVO	Prepare preview	The received company data is presented to the user. Note that the exceptions to the preview requirement that have been defined in the SDGR will not be implemented: the user is always presented the option to preview the data. Specific information on the role of the SDGR-preview for the pilot will be added and the user interface will also have to support the English language. This dialogue may also need instructions on how to act when the DP data contains errors.	eProcedure Portal Evidence Interchange Management – front end: ux-design and functional requirements	9
User		Preview evidence	User previews the company data to be exchanged and decides to: ▸ approve the use of (all) the evidence and continue the registration process ▸ decline the use of (all) the evidence and abort the registration process. In case the user declines the preview it will be shown information on the alternative procedure (the registration procedure that is in place already today without use of the OOP TS). If the data seems incorrect, the user is advised to contact the data provider. The user may use the alternative procedure or stop the process completely.	eProcedure Portal	Decline: 13
Data evaluator	RVO	Delete evidence	In case the user does not approve the forwarding of the evidence to RVO, the received 'DBA company data'-evidence is deleted from the environment of the Data Evaluator.	eProcedure Portal Note that not the Evidence Interchange Management – front end is used. This	

				deviates from the PSA Process realization, see design choices for explanation .	
Data evaluator	RVO	Evaluate evidence	The evaluator checks to see if the company is currently 'active'. If not, the company cannot enrol. This will be explained before the evidence is presented. The process is terminated. When the evidence checks out (the company is active), the process continues.	eProcedure Portal Note that not the Evidence Interchange Management – front end is used. This deviates from the PSA Process realization, see design choices for explanation .	10
User		Receive acknowledgement of receipt	The user receives information that the company data is received and evaluated and is presented a form to fill in additional (optional) attributes not present in dataset from the DP (contact information like an email-address and mobile number). This will be integrated in the existing registration form for Dutch companies.	eProcedure Portal	11
User		Submit eProcedure	The user fills in the requested additional information to add this to the company registration. This will be integrated in the existing company registration form.	eProcedure Portal	11

Data evaluator	RVO	Provide public service	Store the company data (“aanmakenRelatie A03”), including the LegalPersonIdentifier, and continue with delivering requested service. Additional technical steps may be necessary in flanking systems REBUS, AID, OID.	eProcedure Portal	
User		Receive public service result	The user receives confirmation that the registration is completed and is logged in the portal where the desired service may be requested.	eProcedure Portal	12: Success 14: Cancel 15: Failed

1.2.1.3 Wireframes

See below for the sketches (wireframes) of the user facing web pages. Please note that all texts will be refined for development of the software (texts are drafts).

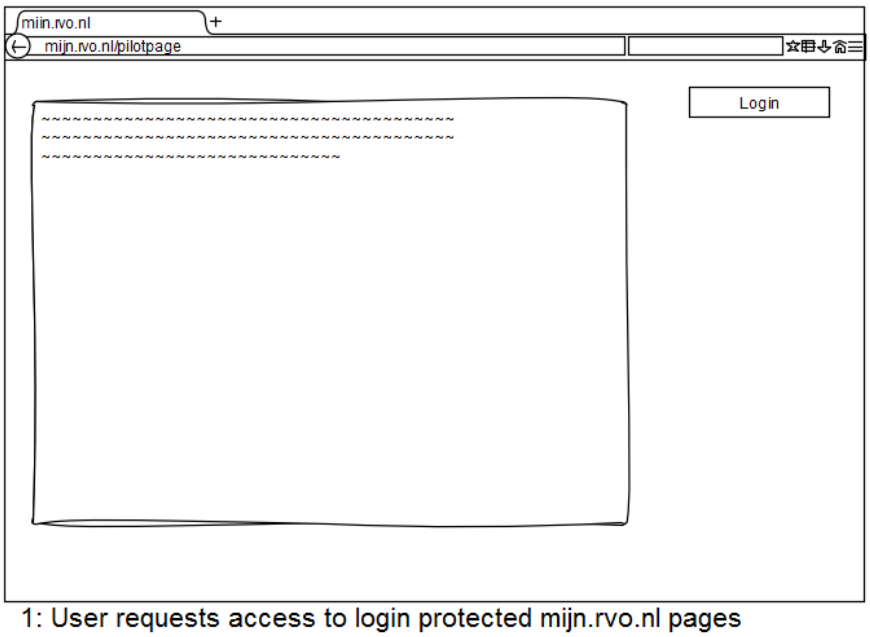
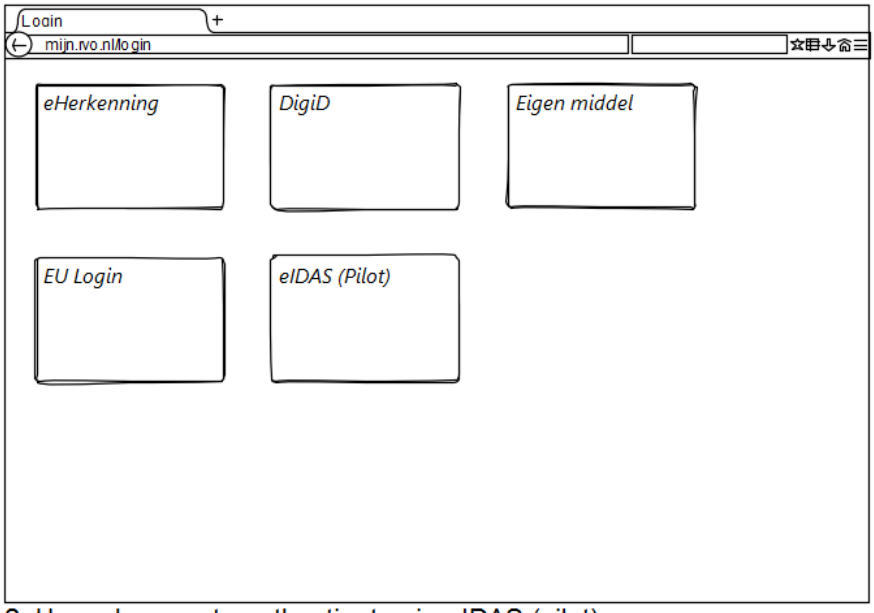


Figure 46: NL example. Mjin.rvo.nl screen

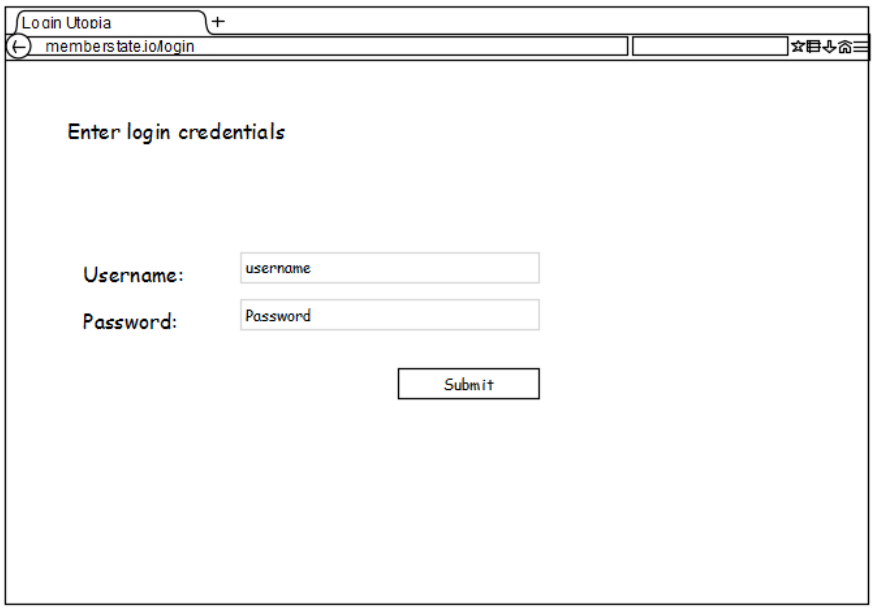


2. User chooses to authenticate via eIDAS (pilot)

Figure 47: NL example. eIDAS login screen

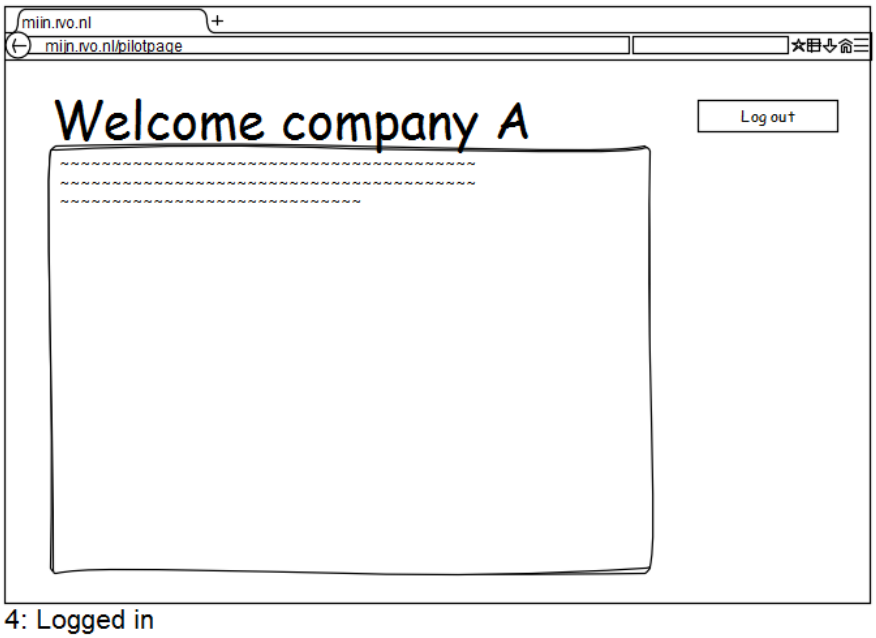
3a. Select country

Figure 48: NL example. Country selection screen



3b. Enter login credentials (country depended)

Figure 49: NL example. Login credential screen



4: Logged in

Figure 50: NL example. User logged screen

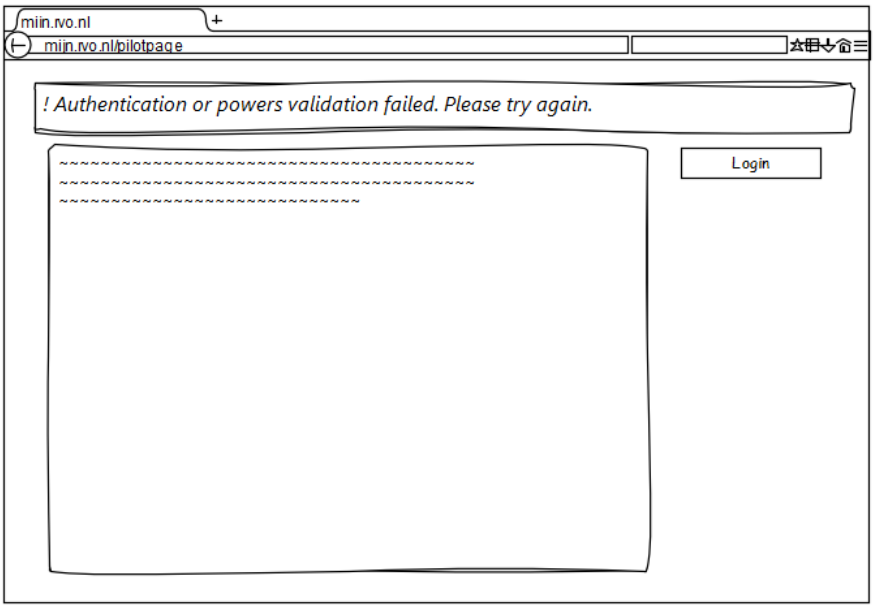


Figure 51: NL example. Error message screen

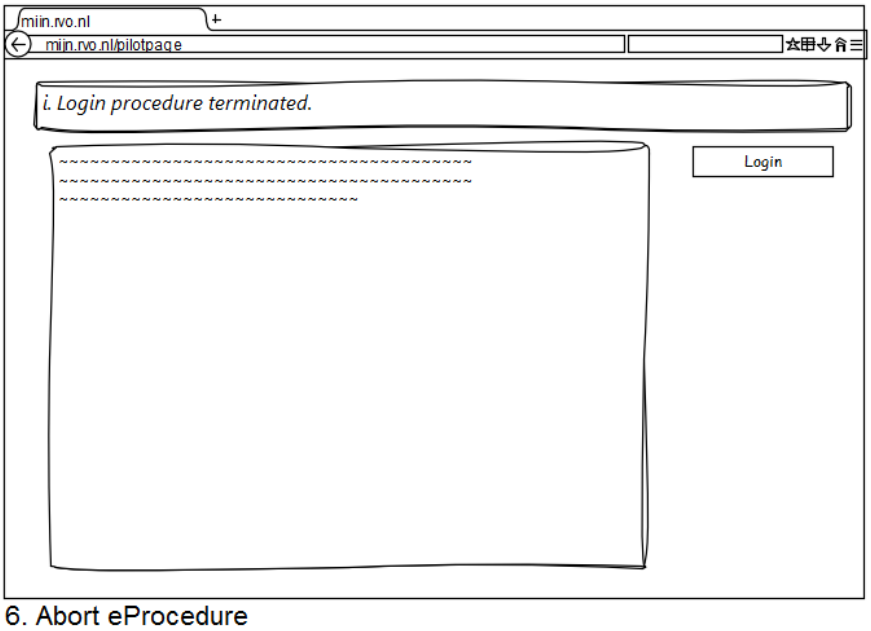
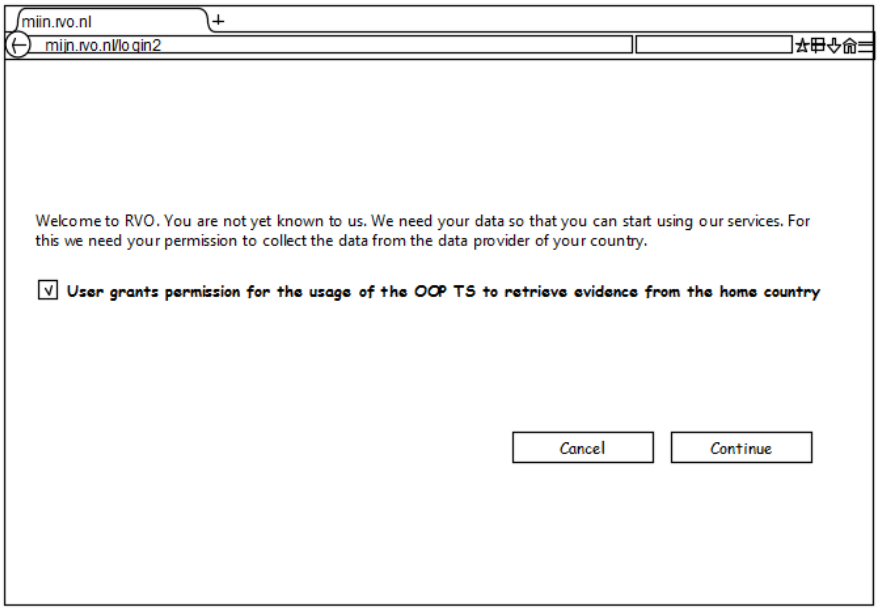
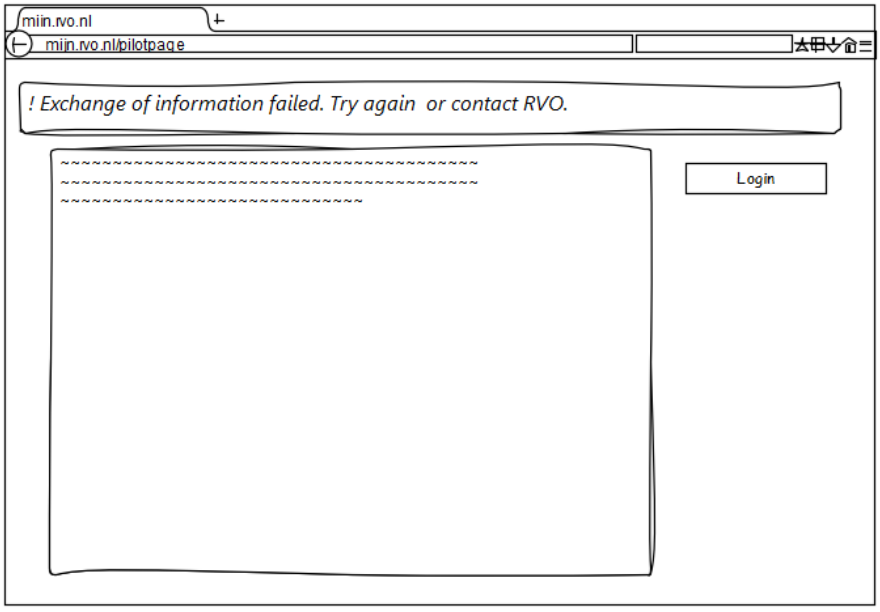


Figure 52: NL example. Abort screen



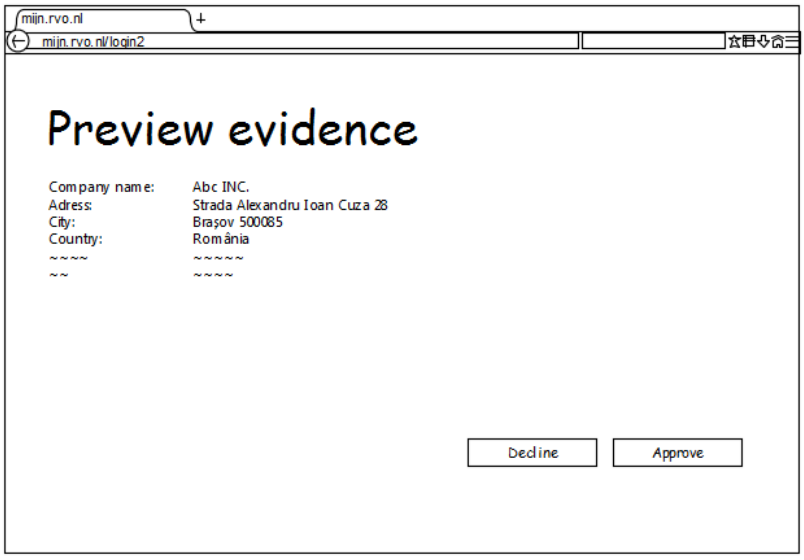
7. Request OOP transfer of evidence

Figure 53: NL example. Transfer evidence request screen



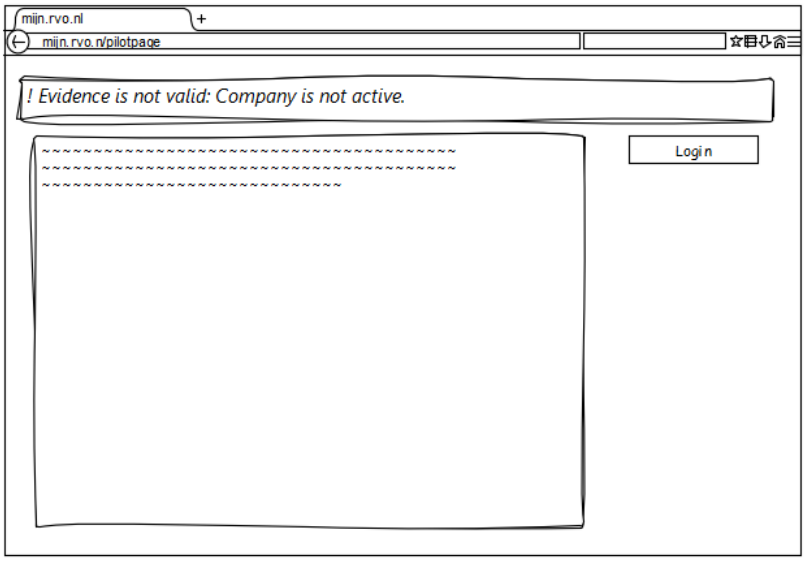
8. Evidence Exchange failed: Inform user on the reason off the failed exchange

Figure 54: NL example. Evidence exchange failed screen



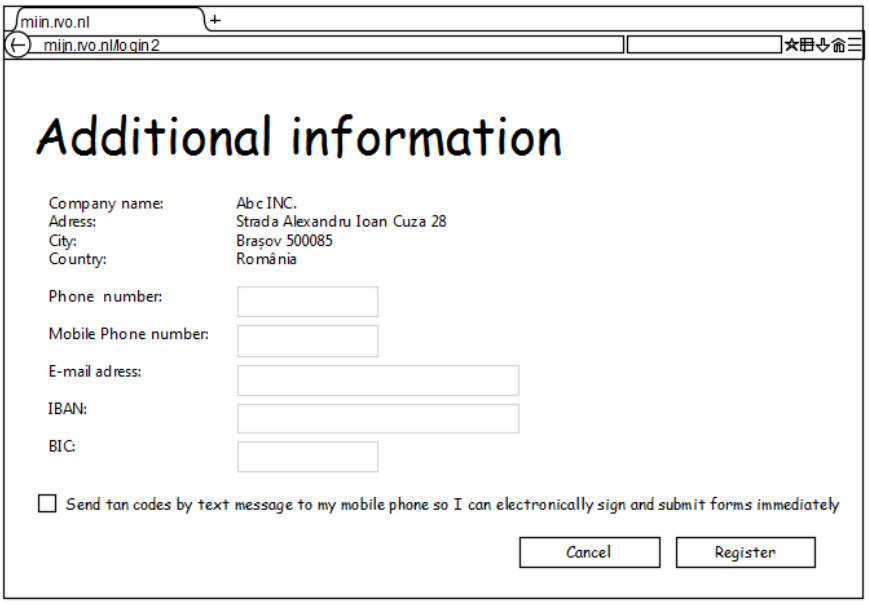
9. Preview evidence: Preview company data

Figure 55: NL example. Preview screen



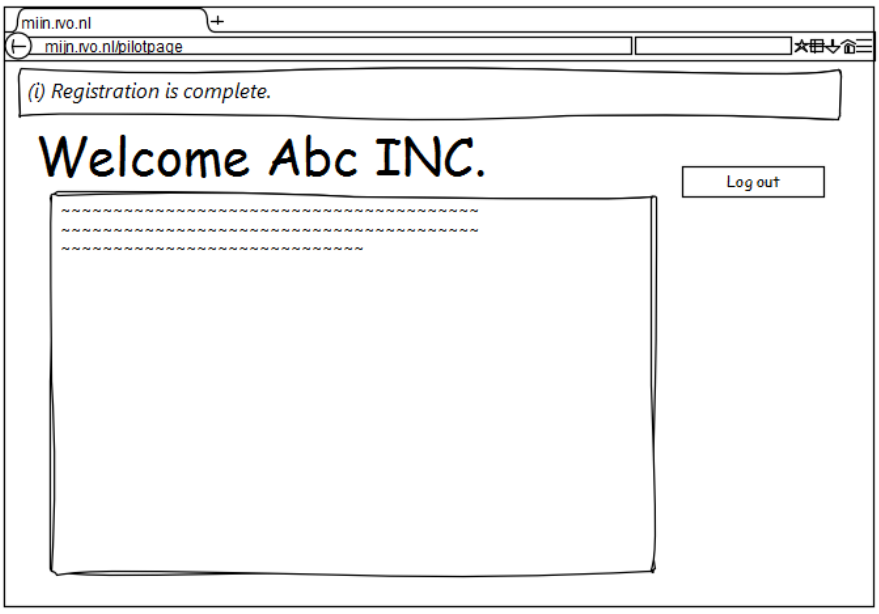
10. Evaluate evidence: Explain evidence is not valid.

Figure 56: NL example. Evidence evaluation screen



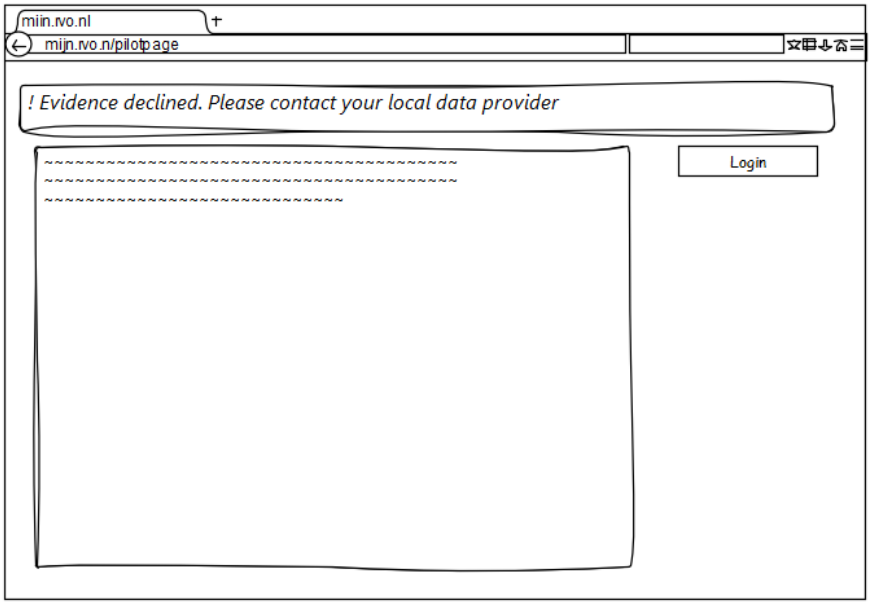
11. fill in additional information

Figure 57: NL example. More information request screen



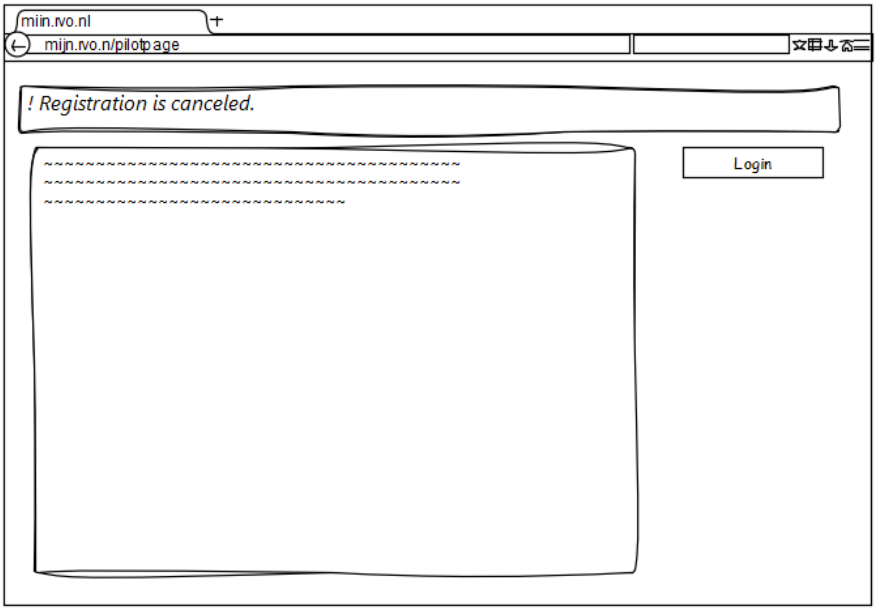
12. Mijn.rvo.nl, logged in, with conformation that that the registration is completed

Figure 58: NL example. Registration complete screen



13. Preview evidence declined: the user is advised to contact the data provider directly

Figure 59: NL example. Preview evidence declines screen



14. Registration cancelled

Figure 60: NL example. Registration cancelled screen

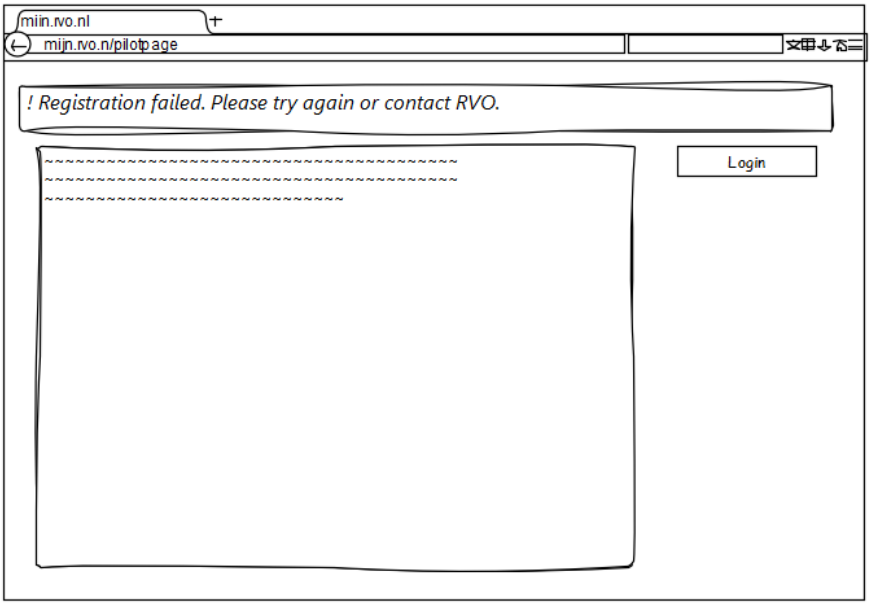


Figure 61: NL example. Registration failed screen

1.2.1.4 Solution architecture

Description of existing NL application components to be used in the DBA-pilot:

Table 155: NL case: DC Scenario existing components

Application	Description
eProcedure Portal: www.rvo.nl / https://mijn.rvo.nl/home	The national company portal for agriculture, energy and innovation
Company register: ERB (eBS)	ERB: ERP-system which also contains the register of relations (natural persons and legal persons). To be replaced with a new system.
Company register: Rebus	Rebus: specific relations database connected to the business register. Functions as ID store and subscription/notification service for the Dutch person and company registries.
Integration layer	Enterprise Service Bus Layer that connects to formal registrations, to take care of exchanging data and orchestration functions.
eIDAS node: eIDAS connector	RVO will host a dedicated pilot node for eIDAS. It will implement eIDAS node version 2.4 (attribute profile version 1.1) including the SEMPER extension. In the first iteration of piloting, the SEMPER extension will not be used for piloting though.
eIDAS node: SEMPER extension	The NL eIDAS SEMPER-extension, implemented on the eIDAS-node to be used for fine grained powers validation in the second pilot iteration.

Visual representation:

See the PSA for the Process realization and application collaboration schemes. In the figure below the Dutch application components and the application services (as defined in the PSA) they realize are visualised:

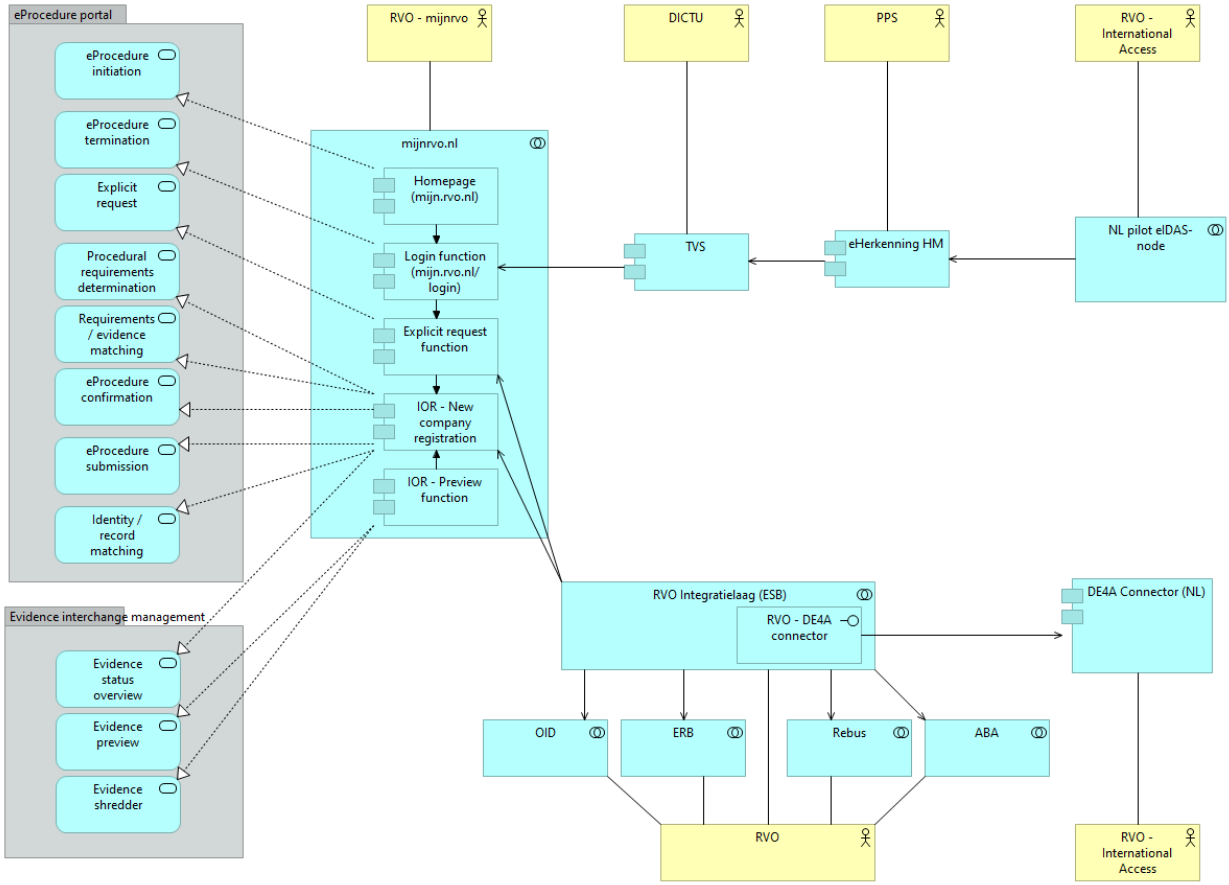


Figure 62: NL case. Solution architecture diagram

Description of new NL application components to be implemented and used in the DBA-pilot

Table 156: NL case: DC Scenario new components

Application	Description
DE4A Connector (NL)	This is the interface between the DE4A node and the RVO systems, which will most likely be an API with soap messages. The national eDelivery-node containing the modules Information Desk, Data Logistics, Evidence Interchange management. The node and modules

	are configured to meet the requirements of the NL DC, DP and product- owner of the node.

Design choices

Table 157: NL case: DC Scenario design choices

#	Application component	Design choice for first pilot iteration (MVP)	Motivation
1	eProcedure portal – session management	The application service 'eProcedure save and resume' will not be implemented.	The DBA pilot only implements an uninterrupted process (not 'save and return later to continue' but 'abort and return later to restart').
2	Information desk – Evidence type translator	The application service 'Cross-border evidence matching' is not needed and will not be implemented.	To reduce complexity in this phase, the evidence 'DBA company data' will be acknowledged by all participants. In the processes of evidence exchange each Member State refers to this commonly accepted evidence identification. Goals of this design choice is to avoid matching different names / concepts used by different Member States.
3	Information desk – Authorization controller	The application services 'Authority check' and 'Legal basis check' will not be implemented. Assumed is that the 'DBA company data' evidence can be requested by all connected participants in the pilot without further authorization or legal basis checks.	Reduce complexity at this stage.
4	Evidence Interchange Management – front end	The application service 'Evidence preview' will be implemented in the eProcedure portal based on UX-specifications and requirements of WP5. The application service will not be implemented in a separate environment (front end of the Evidence Interchange Management) nor will the reference software of the SBB be implemented (if developed).	Reduce complexity at this stage.

#	Application component	Design choice for first pilot iteration (MVP)	Motivation
5	Evidence Interchange Management – front end	The application service 'Evidence status overview' will be simplified: because of the uninterrupted process only the statuses failed or success are communicated to the user; no statuses in between (like 'pending') are communicated.	Fits with the DBA scope to only pilot an uninterrupted process.
6	Evidence Interchange Management – back end	The application service 'Evidence shredder' will be implemented in the eProcedure portal; the OOP-node does not store the evidence.	Reduce complexity at this stage.
7	Trust Architecture - Record matching	'Identity/record matching' for company-id's is done by the eProcedure portal based on the design decisions on the company-id as described in the DBA company data-model. No other attributes are needed, nor an algorithm for the process of matching. Identity matching for natural persons is not needed. In the case of pre-existing companies without this company-ID, this may require prefilling the ID's beforehand (for pilot purposes only).	Reduce complexity at this stage.
8	Trust Architecture - Data encryption/decryption	'Data encryption/decryption' is implemented in two phases: first between the OOP-nodes of the participating members states and then between the OOP-node and RVO. For the pilot, only TLS will be used (not message/payload encryption).	Conform DE4A-standards.
9	Trust Architecture - Mandates/powers	Powers-validation is implemented with the SEMPER eIDAS-extension. The eProcedure portal initiates the powers validation as part of the authentication and the eIDAS-node processes the powers validation.	SEMPER will be used for powers validation in the DBA-pilot. Note that in the first phase of piloting only full powers will be validated; the SEMPER-extension is not required then.

1.2.1.5 Gap Analysis

Service provider

Table 158: NL case: DC Scenario SP components

Application component	Change description	Change owner	Precondition
Mijn.rvo.nl	Separated authentication option for DE4A-pilot needed, including powers validation	RvO	-
	Support explicit request flow with own software that implements the requirements on explicit request.	RvO	Explicit request UX-requirements and reference software available: WP5 SP can choose to implement the reference software or to implement the requirements with their own software.
	Support presenting evidence status (success or failed)	RvO	
	Adapt preview of evidence to DE4A-requirements: at least specific information on the role of the preview for the pilot will be added to the existing preview-screen and the user interface will also have to support the English language.	RvO	Preview UX-requirements and reference software available: WP5
ERB	No know gaps	RvO	
REBUS	Check role in authentication process mijnrvo.nl. Is REBUS necessary for intermediation pattern If so: Functionality to store EU companies and ID's in REBUS. Check role in (un)subscriptions and notifications (for later phase)	RvO	
Integration Layer	Determine architecture and implementation of request to OOP node, alongside 'regular' requests to Dutch registries. Check role in (un)subscriptions and notifications (for later phase?)	RvO	
ABA	Current alternative login for foreign companies. Role in this process to be determined.	RvO	

Application component	Change description	Change owner	Precondition
OID	Current alternative login for foreign companies. Role in this process to be determined.	RvO	

National (non OOP) components

Table 159: NL case: DC Scenario Non OOP components

Application component	Change description	Change owner	Precondition
eIDAS-node	Upgrade to meet requirements and connect to participants	EIDAS team/RvO	

OOP-components

Table 160: NL case: DC Scenario OOP components

Application component	Change description	Change owner	Precondition
SDG-node	Create environment to implement SDG-node software on.	RvO	
	The building block eDelivery for exchanging the evidence 'SDG company data' needs to be implemented on the Dutch SDG-node.	RvO	Software for SDG-node based on eDelivery available: WP5
	Implement metadata-files	RvO	Structure for metadata-files needs available: WP5

1.2.1.6 Requirements

Service provider

Table 161: NL case: DC Scenario SP requirements

Application component	Requirement
Mijn.rvo.nl/login	Add a 'guided' login option for the DBA pilot: connects to pilot eIDAS-node, requests natural and legal person attributes and request full powers validation.
Mijn.rvo.nl/login	Process the authentication SEMPER-response; if powers are not sufficient, terminate process
Mijn.rvo.nl/registering company	Add explicit request

National (non OOP) components

Table 162: NL case: DC Scenario SP non OOP requirements

Application component	Requirement
eIDAS-node	upgrade to required version of CEF software
eIDAS-node	upgrade to required version of SEMPER-extension

OOP-components (to be handed over to WP5)

Table 163: NL case: DC Scenario SP OOP requirements

Application component	Requirement
Explicit request	[UX, legal, functional, technical]
Evidence preview	[UX, legal, functional, technical]
Information desk	[UX, legal, functional, technical]
Data logistics	[UX, legal, functional, technical]

1.2.2 Data provider

In the first iteration of this chapter the scope is limited to:

- Use case: UC1
- Pattern: intermediation pattern
- Evidence: DBA company information (CompanyInfo)

1.2.2.1 Process design

Visual representation:

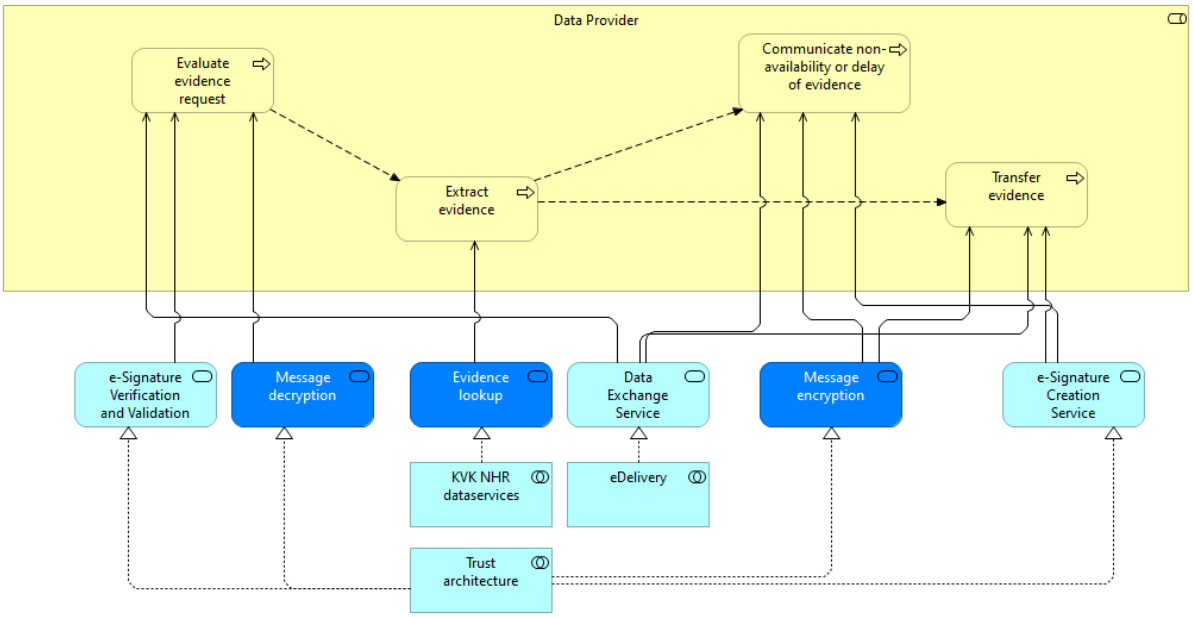


Figure 63: NL case. DP scenario representation

Roles:

- Data owner: KVK
- Data transferor: RVO

Description of process steps:

Table 164: NL case: DP Scenario process

Role	Process step	Description
Data transferor	Evaluate evidence request	RVO receives a request for CompanyInfo (with eIDASLegalPersonIdentifier as identifier of the requested company), decrypts the request and technically validates the request. RVO transforms the message to a request for the KVK, with KVK-nummer as identifier of the requested company, and sends the request.
Data owner	Extract evidence	KVK receives the request and extracts the company data from the Business register with the received company identifier and sends the company data to the RVO.
Data transferor	Communicate non-availability or delay of evidence	RVO detects a technical error or receive a message from KVK with a technical error and reports this to the requesting Member State.
Data owner	Extract evidence	RVO maps the received company data to the requested evidence type (CompanyInfo). Note that this is the responsibility of the data owner and should be done before sending the data to the Data transferor. To reduce complexity of the pilot this will be implemented by the RVO.
Data transferor	Transfer evidence	RVO and sends the evidence to the requesting Member State.

1.2.2.2 Solution architecture

Visual representation:

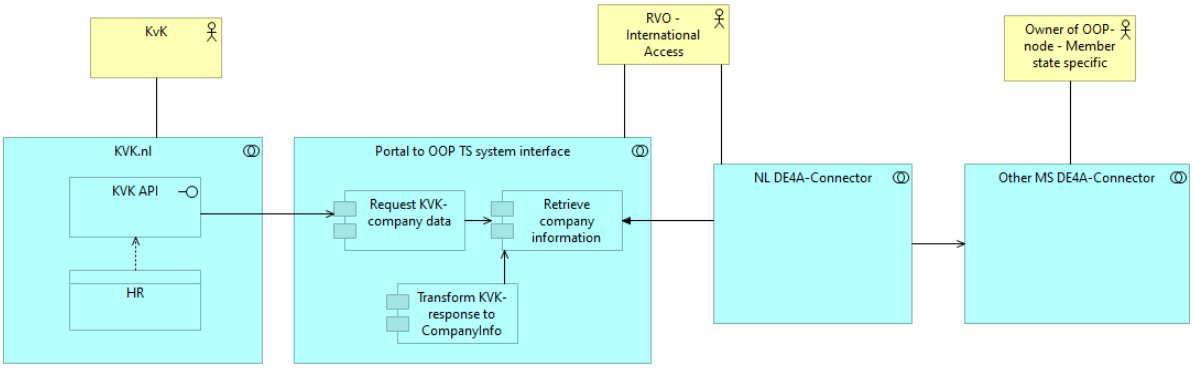


Figure 64: NL case. DP Scenario Solution architecture

The details on the NL DE4A-connector and the mapping of the application components to the PSA reference architecture are described in the DBA-solution architecture.

Description of application components to be used in the DBA-pilot:

Table 165: NL case: DP Scenario components

#	Application	Description
1	HR Dataservice + KVK API	Existing webservice (KVK API) and will be used as-is.
2	HR	Business register database (Handelsregister)
3	NL DE4A-connector	The Dutch DE4A-connector as described in the DBA Solution Architecture.
4	Data source to OOP TS system interface	The interface between the data owner KVK and the OOP TS.
5	Data source to OOP TS system interface – Retrieve company information	Component that collects, prepares and returns the Company information as requested by other Member States via the OOP TS.
6	Data source to OOP TS system interface – Request KVK Company data	Component that uses the KVK-API to request and receive company data.
7	Data source to OOP TS system interface – Transform KVK-response to CompanyInfo	Component that transforms the received KVK Company data to the DE4A evidence type CompanyInfo.

1.2.2.3 Gap analysis

Table 166: NL case: DP Scenario analysis

#	Application component	Change description	Change owner	Precondition
1	Portal to OOP TS system interface – Retrieve company information	New component that orchestrates the retrieval and return of the Company information	RVO International Access	CompanyInfo xsd available.
2	Portal to OOP TS system interface – Request KVK Company data	New component that queries the KVK API.	RVO International Access	
3	Portal to OOP TS system interface – Transform KVK-	New component that maps the received data to the requested DE4A evidence type	RVO International Access	CompanyInfo xsd available.

#	Application component	Change description	Change owner	Precondition
	response to CompanyInfo			
4	DE4A-connector	New connector. See DBA Solution architecture for a detailed description.	RVO International Access	Functional and technical specifications and reference software of DE4A-connector are available.

1.2.3 eIDAS outbound

1.2.3.1 Process design

The process design is conformed to the process design as described in the project start architecture and the DBA solution architecture.

1.2.3.2 Solution architecture

Visual representation:

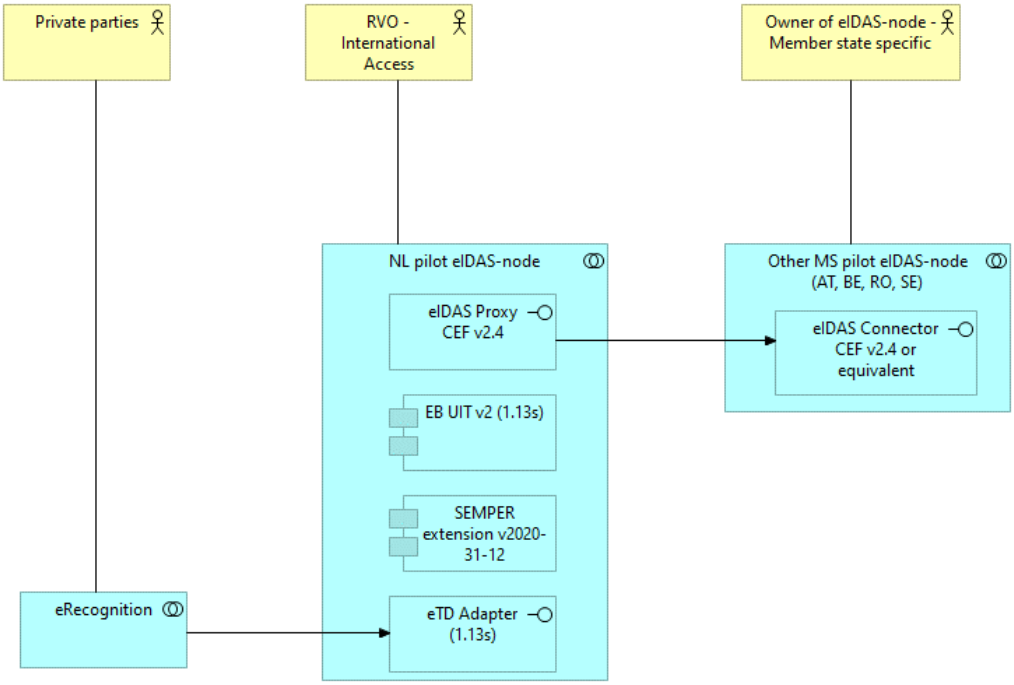


Figure 65: NL case. eIDAS diagram

Description of application components to be used in the DBA-pilot:

Table 167: NL case: eIDAS Scenario components

Role	Application	Description
Identity provider	eRecognition	Notified Dutch eID: operated by private parties (https://afsprakenstelsel.etoegang.nl/). eRecognition

Role	Application	Description
Legal person attribute provider Mandate management system		holds the functionality for authenticating users (natural person), validating their powers to represent a company in a full powers and a fine grained scenario, and delivering at least the mandatory legal person attributes.
Authentication proxy – pilot eIDAS proxy	NL pilot eIDAS-node – proxy	A dedicated pilot eIDAS-node. The pilot eIDAS-node that is currently used (until 2021-q1) for the SEMPER pilot will be used for the DBA pilot. The proxy will be equipped with the CEF Reference software version 2.4.
Authentication proxy – specific eIDAS proxy component	NL pilot eIDAS-node – EB UIT & eTD Adapter	The NL specific components to transform the eIDAS-request to a request that can be handled by eRecognition (and v.v.).
Authentication proxy – SEMPER extension	NL pilot eIDAS-node – SEMPER Extension	The SEMPER software that is implemented on the eIDAS-node.

1.2.3.3 Gap analysis

Table 168: NL case: eIDAS Scenario analysis

Application component	Change description	Change owner	Precondition
eRecognition	eRecognition delivers all required functionality but is not fully connected to eIDAS yet: the version of eRecognition to be used will be available in acceptance in 2021-q1 and in production later in 2021.	RVO International Access and private parties	-
NL pilot eIDAS-node	The current eIDAS SEMPER-node needs to be updated: reference software v2.4 and the latest SEMPER-release.	RVO International Access	-
	The current eTD adapter needs to be upgraded to version 1.13s.	RVO International Access	-
	The eIDAS-proxy needs to be connected to the eIDAS-connectors of the other MS.	RVO International Access	eIDAS-connectors of other Member State are available

1.3 Romania

1.3.1 Data consumers (Pilot scenario DBA6: eService Layer at portal.onrc.ro)

1.3.1.1 Pilot scenario description

Overview:

In order for a foreign company to do business in Romania, that company has to register a new branch in the National Trade Register Office of Romania (ONRC). Currently this can be done by fulfilling an online procedure on ONRC portal, portal.onrc.ro. In this procedure, user will input the attributes of the new branch and also the information about the parent company. To prove his powers of representation that he has on the parent company, powers that allow him to register a new company branch, user will send documents through the online procedure. After the user submits all the necessary information, in the Backoffice, a legal expert with specific role will evaluate all the information submitted and approve or not the registration of the new branch.

In this pilot scenario, a new online procedure will be implemented for registering a new branch. In this new service, called from now on eService, the identification of the company representative, validation of his powers of representation and also the necessary company data will requested directly from the Member State that has the original data. This Member State will be called Data Provider. The eService will be called "Open a business in Romania" and it will run on a pilot version of ONRC portal.

Online procedures:

In this pilot the registration of a new branch (which is in fact a new company) in the National Trade Register Office of Romania is fulfil, using "Open a business in Romania" eService.

Evidence exchanged:

The evidence exchanged is the "DBA company data-evidence", as described in the paper on the DBA data-model (DE4A D4.5 Business Abroad Use Case Definition and Requirements). This evidence comprises all attributes necessary for the company registration.

Roles:

Table 169: RO case: DC Scenario roles

MS	Role[49]	Organization
RO	Data evaluator	ONRC
	Data requestor	ONRC
NL	Data transferor	RvO
	Data owner	KVK (Dutch Chamber of commerce)

[49] Roles: Data Evaluator (DE) is any organization authorized to receive and process data from the User (citizen or business), via the OO TS. In t=2 this is the final Public Service Provider. Data Requestor (DR) is the role making search and request for data possible in terms of technology. If the DR is a separate entity, they carry out the request under the mandate of the DE. Data Owner (DO) is any organization owning information about the User (citizens or businesses), a base registry or a secondary registry that might be necessary for another organization to exercise their competencies. It is responsible of authorization approval, data extraction and audit control. Data Transferor (DT) is technically responsible for the actual data transmission. They operate the Data Service, exposing the data in the OO TS. In some cases, DO and DT are both the same actor/organisation, but they can also be different entities. The second is always the case when a national or sectoral intermediary is acting as an evidence broker.

MS	Role[49]	Organization
AT	Data transferor	BRZ
	Data owner	Federal Ministry for Digital and Economic Affairs (BMDW)
BE	Data transferor	BOSA
	Data owner	Crossroads Bank for Enterprises (CBE)
SE	Data transferor	Bolagsverket (BVE)
	Data owner	Bolagsverket (BVE)

1.3.1.2 Process design

Visual representation:

The process to be piloted matches the intermediation process – business process collaboration as described and visualized in the PSA. Please see the PSA for a visual representation.

Description of process steps:

Table 170: RO case: DC Scenario process

Role	Process step	Description	Application collaboration
User	Request or resume public service	User is accessing "Open a business in Romania" on pilot version of the ONRC portal. If he hasn't have an account on the portal, he will be asked to create one. After successful login into portal account, user begins to apply for the service "Open a business in Romania". Note: For the purpose of this pilot, to reduce complexity, login into portal account will be skipped.	eProcedure Portal
Data evaluator	Request authentication	Portal sends an authentication request together with powers validation request to Romania eIDAS node. For the purpose of this pilot, a dedicated eIDAS node will be used.	eProcedure Portal Trust architecture – eIDAS-node
User	Provide authentication details[50]	User chooses to authenticate via eIDAS-SEMPER (authentication via national eID is not part of the pilot) and provides details. This includes identifying the company and optionally selecting the mandate to use (Member State specific). Note that in the first phase of the pilot only full powers will be used and the SEMPER-extension is not	Trust architecture – eIDAS-node

[50] This is an uninterrupted process; see design choices. User has to be informed if a retry of the process is recommended or not. This can be recommended if the DP country needs time to prepare the validation of powers. A solution for this scenario is needed, either on DC- or on DP-side.

Role	Process step	Description	Application collaboration
		needed. The SEMPER-extension will be used in later phase of the pilot.	
Data evaluator	Establish user identity	ONRC receives authentication details. If the company is already in the ONRC database, company data is shown to the user and the user can continue applying for the service using this data. Note: If the company is already in the business register database, this means the company has already at least a branch registered. Nevertheless, user is free to register a new branch, the only constraint being for the new branch to have the office address in another county. For the purpose of this pilot this constraint will not be checked.	eProcedure Portal Trust architecture – eIDAS-node
Data evaluator	Redirect user to another channel	If the authentication and/or powers validation failed ONRC terminates the process and presents an information page with alternative options to the user.	eProcedure Portal
User	Abort eProcedure	User chooses to terminate the procedure and returns to the ONRC portal.	eProcedure Portal
Data evaluator	Determine procedural requirements	This is integrated in the process step 'determine required cross-border evidence'. In this step, the Data evaluator must check if the company is still active. This checking could also be done on Data Provider side, in the user authentication process.	eProcedure Portal
User	Request OOP transfer of evidence[51]	User is asked to give an explicit request, reads the presented information on the explicit request and: ▸ decides to explicitly request the evidence via the OOP TS ▸ aborts the process ▸ (decides to deliver the evidence not using the OOP TS: not part of the pilot) Note that there are no exceptions: the user is always asked to give an explicit request.	eProcedure Portal
Data evaluator	Determine required cross-border evidence	ONRC decides on which company data to request from other Member State and sends the requests for the required evidence to the data requestor. The data-evidence requested will be according to the data model specified in the DE4A D4.5 Business Abroad Use Case Definition and Requirements document.	eProcedure Portal

[51] It is recommended to ask the user to agree to participate in the pilot as long as the SDG is not yet in effect; the user needs to be aware of the legal basis of the explicit request.

Role	Process step	Description	Application collaboration
Data requestor	Lookup routing information	ONRC find the DP to which the request will be send.	Information Desk
Data requestor	Request evidence	ONRC request the evidence from the DP found.	Data logistics Trust architecture
Data requestor	Establish non availability of OOP	In case the OOP TS is offline, the company cannot be recognised by the DP, there is a time-out in retrieving evidence or the evidence is not available.	Evidence exchange management
Data evaluator	Update evidence status	If the exchange was successful the user is informed and the process continues. If the evidence exchange failed the user is informed and the process is terminated. The user is also informed on the reason of the failed exchange, so the user knows if a retry could lead to a successful exchange. Possible reasons: ▸ the OOP TS is offline: retry or contact OOP TS-service desk ▸ the company cannot be recognized by the DP: contact Data Owner ▸ there is a time-out in retrieving evidence: retry or contact OOP TS-service desk ▸ the evidence is not available: contact OOP TS-service desk	Evidence interchange back-end
User	Follow evidence status	User takes notice of presented status information of the evidence exchange: success of failed.	eProcedure Portal
Data requestor	Forward evidence	Note: In this pilot data evaluator is also the data requestor.	Evidence exchange management Data logistics Trust architecture
Data evaluator	Prepare preview	The received company data is presented to the user every time, without exceptions. The GUI interface will support English language.	eProcedure Portal
User	Preview evidence	User previews the company data to be exchanged and decides to: ▸ approve the use of the evidence and continue the process ▸ decline the use of evidence and abord the process	eProcedure Portal

Role	Process step	Description	Application collaboration
Data evaluator	Delete evidence	In case the user does not approve the exchange of the evidence the received 'DBA company data'-evidence is deleted from the environment of the Data Evaluator.	eProcedure Portal
Data evaluator	Evaluate evidence	Ask the user to complete the registration by providing the additional required attributes.	eProcedure Portal
User	Receive acknowledgement of receipt	The user receives information that the company data is received and can be used and is presented with a form to fill in additional information.	eProcedure Portal
User	Submit eProcedure	The user fills in the requested additional information to add this to the branch registration. The additional information will be as follows: ▸ branch name ▸ branch legal form ▸ branch office address ▸ branch main activity ▸ branch shareholder (by default will be the parent company) ▸ branch representative (by default will be parent company's representative) At the registration, the branch also will automatically receive a registration number and a fiscal code. Note that this additional information is a simplified version used only for the purpose of this pilot.	eProcedure Portal
Data evaluator	Provide public service	Store the company data and continue with delivering requested service.	eProcedure Portal
User	Receive public service result	The user receives confirmation that the branch registration is completed. Note: In the real life, a company registration it is approved by a legal expert with a specific role. For the purpose of this pilot, registration of the company (branch) will be done automatically, when user presses the submit button. The user will be shown a summary page containing the relevant data of the new company (branch).	eProcedure Portal

1.3.1.3 Wireframes

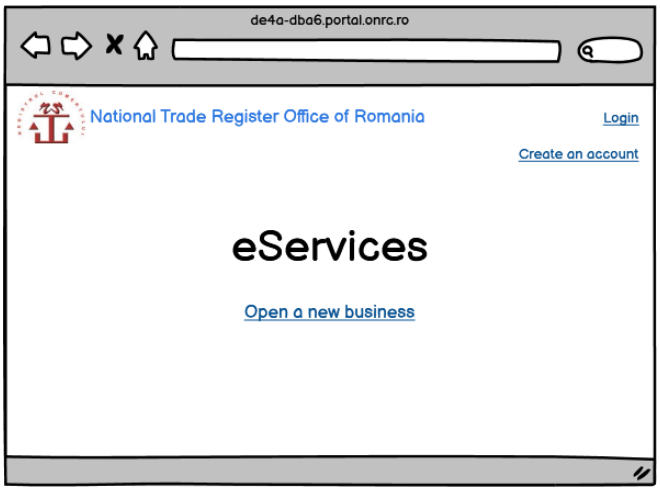


Figure 66: RO example. Welcome screen

Figure 67: RO example. Login screen

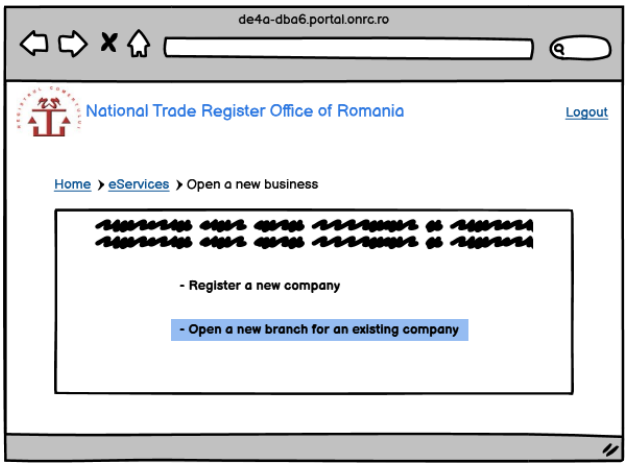


Figure 68: RO example. User logged screen

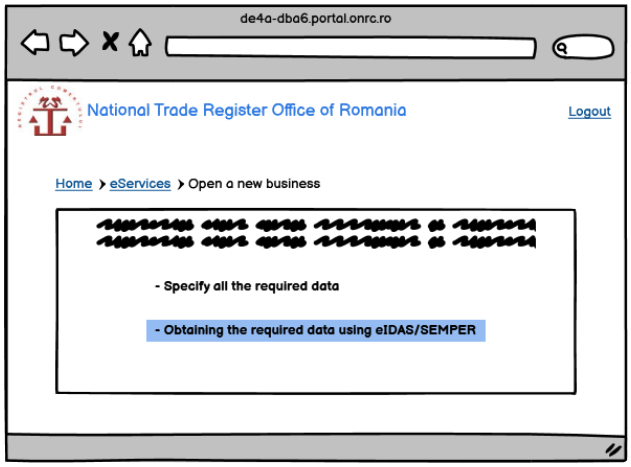


Figure 69: RO example. Selecting eIDAS screen

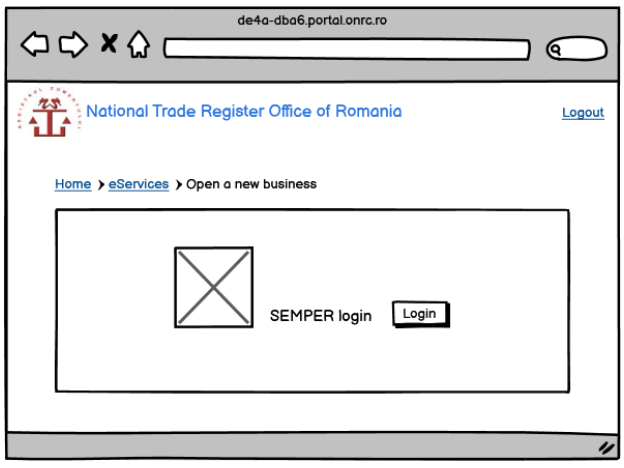


Figure 70: RO example. Selection SEMPER screen

Figure 71: RO example. Country selection screen

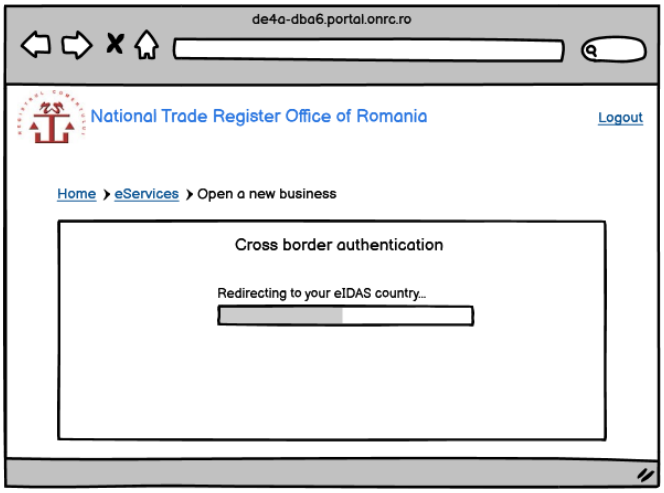


Figure 72: RO example. Cross border authentication screen

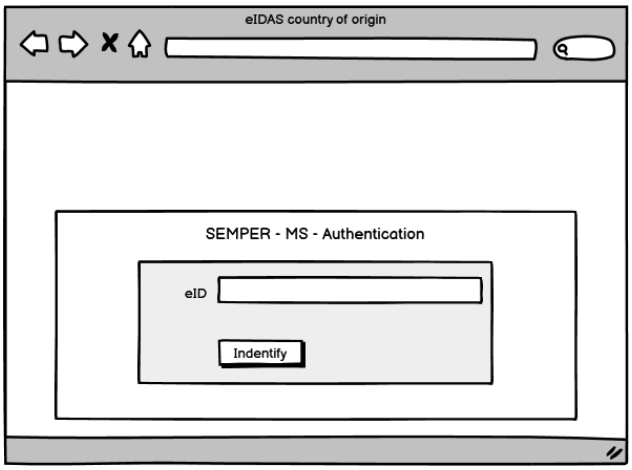


Figure 73: RO example. SEMPER login screen

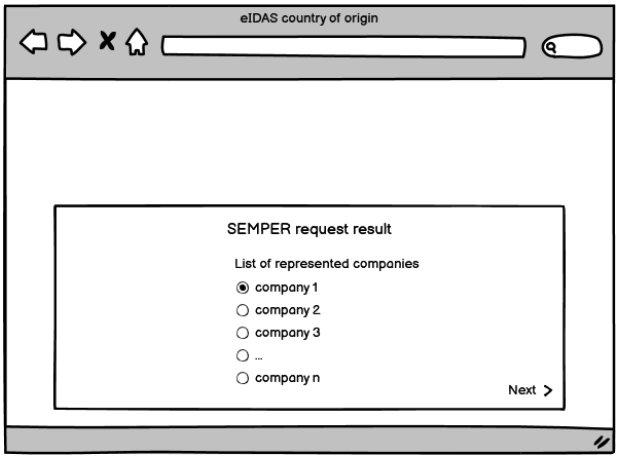


Figure 74: RO example. Company selection screen

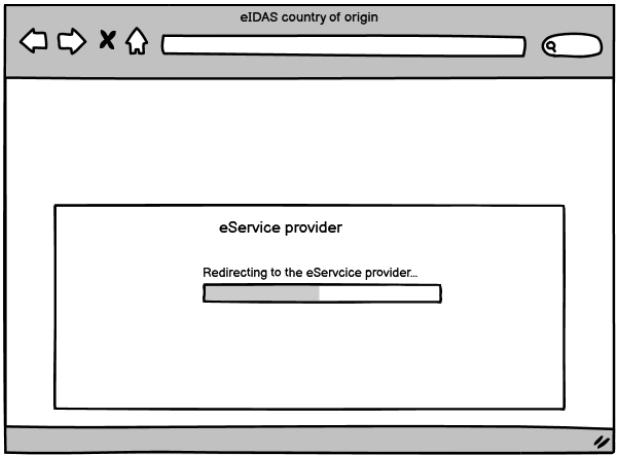


Figure 75: RO example. eService provider redirection screen

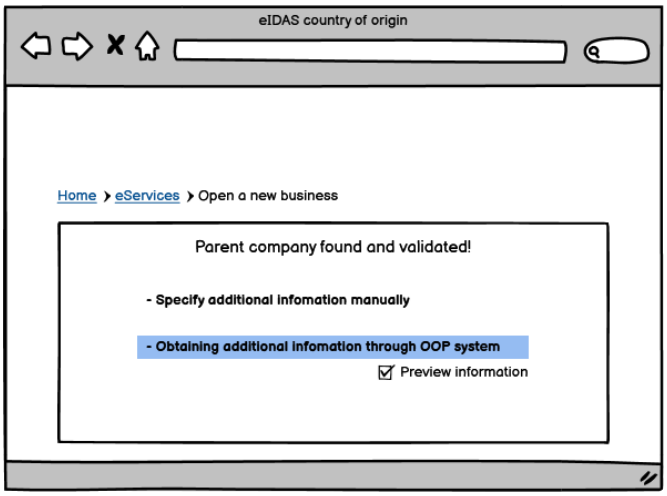


Figure 76: RO example. Parent company found screen

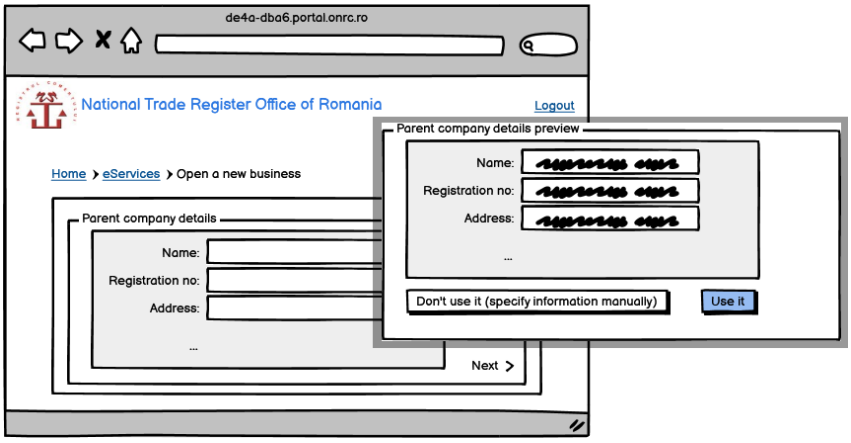


Figure 77: RO example. Representation selection screen

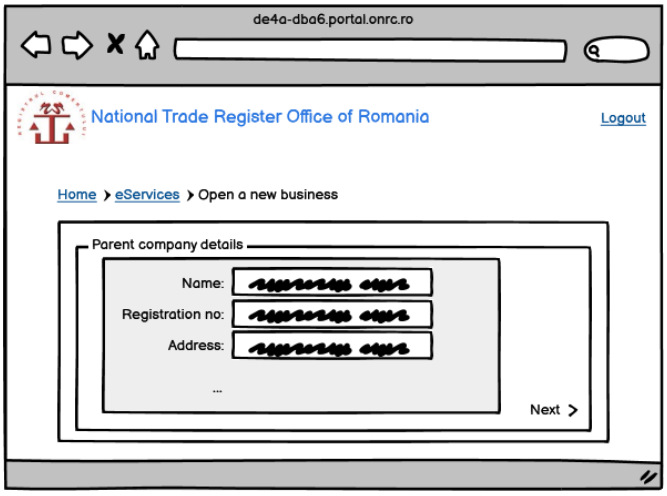


Figure 78: RO example. Company details screen

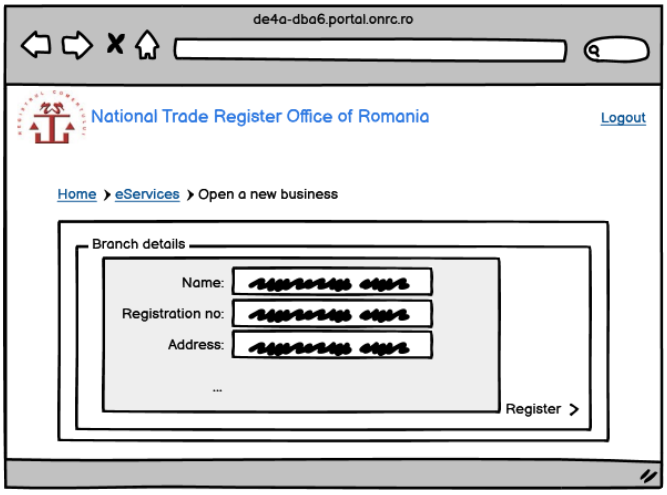


Figure 79: RO example. Branch details screen

Figure 80: RO example. Branch registered screen

1.3.1.4 Solution architecture

Visual representation:

See the PSA for the Process realization and application collaboration schemes. In the figure below the Dutch application components and the application services (as defined in the PSA) they realize are visualised:

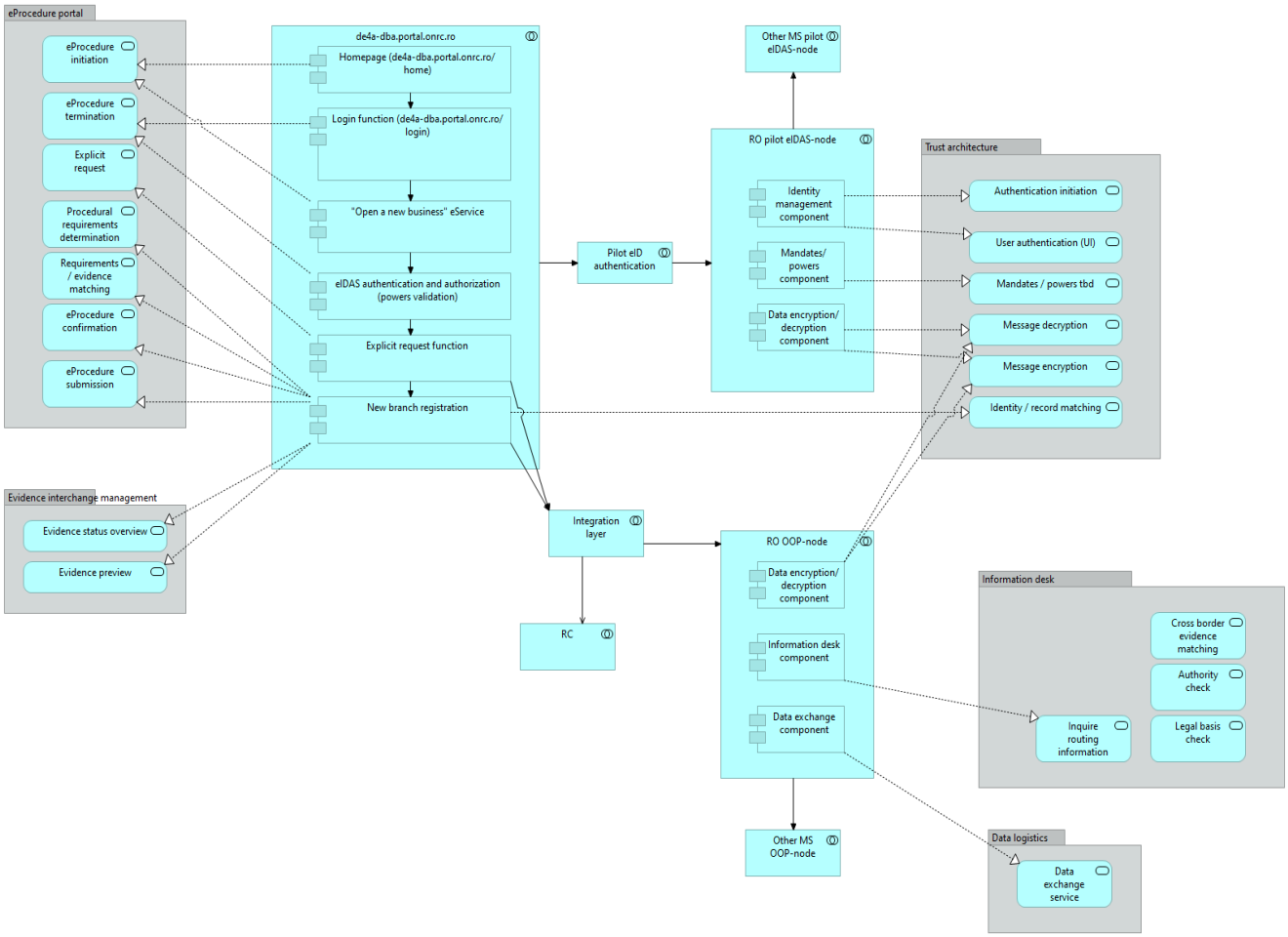


Figure 81: RO case. Solution architecture diagram

Mapping of RO applications on PSA reference architecture.

Table 171: RO case: DC Scenario applications

Application collaboration	Application component	Application service	Portal.onrc.ro	RC	Integration layer	RO pilot eIDAS-node	RO pilot OOP-node
eProcedure portal	eProcedure Portal front end	▸ eProcedure initiation ▸ Explicit request ▸ eProcedure termination ▸ eProcedure submission ▸ eProcedure confirmation	X	X	X	-	-

Application collaboration	Application component	Application service	Portal.onrc.ro	RC	Integration layer	RO pilot eIDAS-node	RO pilot OOP-node
	eProcedure rules engine	▸ Procedural requirements determination ▸ Requirements/evidence matching	X	-	-	-	-
	Logging/Archiving	All services	X	X	X	X	X
Information desk	Evidence type translator	Cross-border evidence matching	-	-	-	-	-
	Evidence Map Editor		-	-	-	-	-
	Data service lookup	Inquire routing information	-	-	-	-	X
	Service registry editor		-	-	-	-	-
	Authorization controller	▸ Authority check ▸ Legal basis check	-	-	-	-	-
	Authorities editor		-	-	-	-	-
	Equivalent evidence		-	-	-	-	-
	Evidence Map		-	-	-	-	-
	Competent authorities		-	-	-	-	-
Evidence Interchange Management	Evidence interchange front-end	▸ Evidence status overview ▸ Evidence preview	X	-	-	-	-
Trust Architecture	Identity Management Component	▸ Authentication initiation ▸ User Authentication (UI)	X	-	-	X	-
	Record matching	Identity/record matching	X	-	-	-	-
	Data encryption/decryption	▸ Message encryption ▸ Message decryption	X	-	-	X	X

Application collaboration	Application component	Application service	Portal.onrc.ro	RC	Integration layer	RO pilot eIDAS-node	RO pilot OOP-node
	Mandates/powers	TBD in context of DBA pilot	-	-	-	X	-
Data logistics	Data Exchange Component	Data Exchange Service	-	-	-	-	X
	Data Exchange gateway		-	-	-	-	X

Description of existing RO application components to be used in the DBA-pilot:

Table 172: RO case: DC Scenario existing components

Application	Description
eProcedure Portal: https://portal.onrc.ro/ONRCPortalWeb/ONRCPortal.portal	The National Trade Register Office of Romania portal. For the purpose of this pilot, a dedicated version of ONRC portal will be used.
Business register: RC	RC: Integrated Information System that it is used to register and manage all the necessary data about the new and existing companies. For the purpose of this pilot a dedicated API will be used for registering company and branch data in the database.

Description of new RO application components to be implemented and used in the DBA-pilot

Table 173: RO case: DC Scenario new components

Application	Description
RO OOP-node	eDelivery-node dedicated to DBA pilot containing the modules Information Desk, Data Logistics, Evidence Interchange management. The node and modules are configured to meet the requirements of the RO DC and DP.
Integration layer	Layer that connects to formal registrations, to take care of fetching data and updating data
Pilot eIDAS node: eIDAS connector together with SEMPER extension	The dedicated RO eIDAS-connector together with SEMPER extension to be used for the DE4A-pilot.

1.3.1.5 Design choices

Table 174: RO case: DC Scenario design choices

Application component	Design choice	Motivation
eProcedure portal – session management	The application service 'eProcedure save and resume' will not be implemented.	The DBA pilot only implements an uninterrupted process (not 'save and return later to continue' but 'abort and return later to restart').
Information desk – Evidence type translator	The application service 'Cross-border evidence matching' is not needed and will not be implemented.	To reduce complexity in this phase, the evidence 'DBA company data' will be acknowledged by all participants. In the processes of evidence exchanges each Member State refers to this commonly accepted name. Goals of this design choice is to avoid matching different names / concepts used by different Member States.
Information desk – Authorization controller	The application services 'Authority check' and 'Legal basis check' will not be implemented. Assumed is that the 'DBA company data' evidence can be requested by all connected participants in the pilot without further authorization or legal basis checks.	Reduce complexity at this stage.
Evidence Interchange Management – front end	The application service 'Evidence status overview and preview' will be implemented in the eProcedure portal.	Reduce complexity at this stage.
Evidence Interchange Management – front end	The application service 'Evidence status overview' will be simplified: because of the uninterrupted process only the statuses failed or success are communicated to the user; no statuses in between (like 'pending') are communicated.	Fits with the DBA scope to only pilot an uninterrupted process.
Trust Architecture - Record matching	'Identity/record matching' for company-id's is done by the eProcedure portal based on the design decisions on the company-id as described in the DBA company data-model. No other attributes are needed, nor an algorithm for the	Reduce complexity at this stage.

Application component	Design choice	Motivation
	process of matching. Identity matching for natural persons is not needed.	
Trust Architecture - Data encryption/decryption	'Data encryption/decryption' is implemented between the OOP-nodes of the participating members states.	Conform DE4A-standards.
Trust Architecture - Mandates/powers	Powers-validation is implemented with the SEMPER eIDAS-extension. The eProcedure portal initiates the powers validation as part of the authentication and the eIDAS-node processes the powers validation.	SEMPER will be used for powers validation in the DBA-pilot. Note that in the first phase of piloting only full powers will be validated; the SEMPER-extension is not required then.

1.3.1.6 Gap analysis

Service provider

Table 175: RO case: DC Scenario SP components

Application component	Change description	Change owner	Precondition
de4a-dba.portal.onrc.ro	Create a separate flow to be used for DE4A-BDA pilot that includes: ▸ portal account authentication ▸ new eService, "Open a business in Romania" ▸ user pilot eIDAS authentication, including legal person attribute and powers validation ▸ support explicit request ▸ support presenting evidence status (success or failed) ▸ support preview of evidence ▸ support additional attributes to the previewed evidence, including a function to delete the evidence in case a user does not allow usage after the preview ▸ support UI in English language	ONRC	
RC	New API component that will process and store data coming from DE4A-DBA pilot.	ONRC	

National (non OOP) components

Table 176: RO case: DC Scenario non OOP components

Application component	Change description	Change owner	Precondition
Pilot eIDAS-node	Implement to meet requirements and connect to participants	ONRC	
SEMPER extension	Implement SEMPER extension for powers validation	ONRC	
Mandate Management System	Implement the Mandate Management System	ONRC	

OOP-components

Table 177: RO case: DC Scenario OOP components

Application component	Change description	Change owner	Precondition
SDG-node	Create environment to implement SDG-node software on.	ONRC	
	The building block eDelivery for exchanging the evidence 'SDG company data' needs to be implemented on the Romanian SDG-node.	ONRC	Software for SDG-node based on eDelivery available: WP5
	Implement metadata-files	ONRC	Structure for metadata-files needs available: WP5

1.3.1.7 Requirements

Service provider

Table 178: RO case: DC Scenario SP requirements

#	Application component	Requirement
1	de4a-dba6.portal.onrc.ro/eIDAS login	Connects to pilot eIDAS-node, requests natural and legal person attributes through SEMPER extension and request full powers validation
2	de4a-dba6.portal.onrc.ro/eIDAS login	Process the authentication SEMPER-response; if powers are not sufficient, terminate process.
3	de4a-dba6.portal.onrc.ro/register new branch	Add explicit request

National (non OOP) components

Table 179: RO case: DC Scenario non OOP requirements

#	Application component	Requirement
1	eIDAS-node	Install a pilot dedicated version
2	SEMPER	Install a pilot dedicated version
3	Mandate Management System	Implement a pilot dedicated version

OOP-components (to be handed over to WP5)

Table 180: RO case: DC Scenario OOP requirements

#	Application component	Requirement
1	Explicit request	[UX, legal, functional, technical]
2	Evidence preview	[UX, legal, functional, technical]
3	Information desk	[UX, legal, functional, technical]
4	Data logistics	[UX, legal, functional, technical]

1.3.2 Data provider

Scope:

In the first iteration of this chapter the scope is limited to:

- Use case: UC1
- Pattern: intermediation pattern
- Evidence: DBA company information (CompanyInfo)
- Data provider RO NTRO

1.3.2.1 Process design

Visual representation:

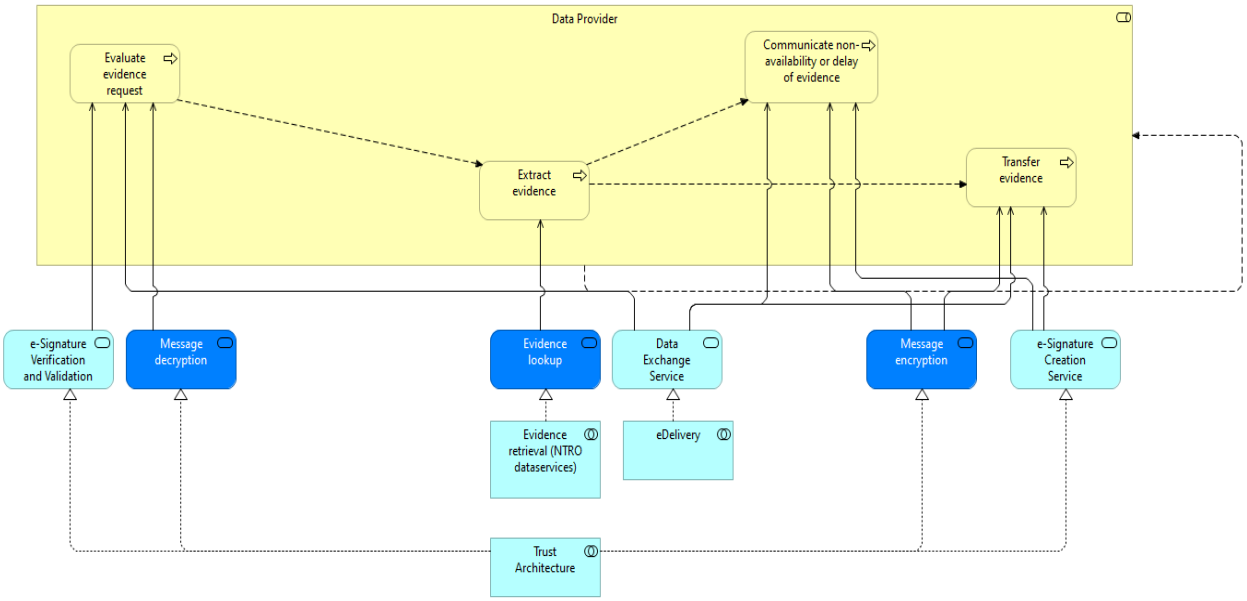


Figure 82: RO case. DP Scenario representation

Description of process steps:

Table 181: RO case: DP Scenario process

Role	Process step	Description
Data transferor	Evaluate evidence request	NTRO (DT) receives a request for CompanyInfo (with eIDASLegalPersonIdentifier as identifier of the requested company), decrypts the request and technically validates the request.
Data owner	Re-establish user identity	*Should be interpreted as: check whether the company identifier can be recognized by the data owner.* <no check needed, process step can be removed>
Data owner	Extract evidence	NTRO (DO) extracts the necessary company data from the database, identifying the company by eIDASLegalPersonIdentifier which will be based on company registration number.
Data transferor	Communicate non-availability of TOOP	*Alternative flow: in case the company could not be found.* <process step can be removed: the next process step processes the technical errors and if a company cannot be

Role	Process step	Description
		found, this must be a technical error (the user has the powers to represent the company so the company should be in the business register)>
Data transferor	Communicate non-availability or delay of evidence	NTRO (DT) detects a technical error.
Data transferor	Transfer evidence	NTRO (DT), transforms the company data to a CompanyInfo-record conform the DBA data-model and sends the CompanyInfo-evidence to the requesting member state.

1.3.2.2 Solution architecture

Visual representation:

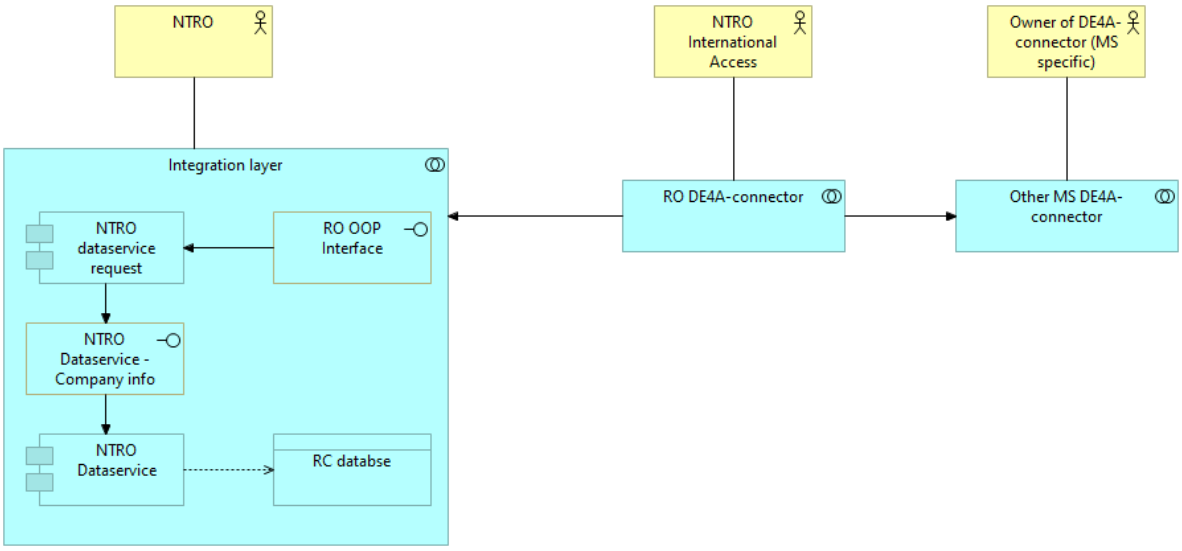


Figure 83: RO case. DP Scenario solution architecture

The details on the RO DE4A-connector and the mapping of the application components to the PSA reference architecture are described in the DBA-solution architecture.

Description of application components to be used in the DBA-pilot:

Table 182: RO case: DP Scenario components

Application	Description
NTRO Dataservice + NTRO Dataservice – Company info interface	Existing Dataservice (InfoSpecAPI) and will be used as-is.
RC database	Business register database
Integration Layer – RO OOP interface	New component on the NTRO Integration layer: interface between DE4A-connector and Integration layer.
Integration Layer – NTRO Dataservice request	Component on Integration layer that interacts with the NTRO Dataservice.
RO DE4A-connector	The Data provider NTRO will use the DE4A-connector as described in the DBA Solution Architecture and the Detailed Pilot Process Design of the RO Data consumer eService at portal.onrc.ro.

1.3.2.3 Gap analysis

Table 183: RO case: DP Scenario analysis

#	Application component	Change description	Change owner	Precondition
1	Integration layer – RO OOP interface	New interface between NTRO Dataservice and RO DE4A-connector for receiving a CompanyInfo request and sending the CompanyInfo response.	NTRO	Functional and technical specifications of DE4A-connector are available. CompanyInfo xml available.
2	DE4A-connector	New connector. See DBA Solution architecture and the Detailed Pilot Process Design of the RO Data consumer eService at portal.onrc.ro for details	NTRO International Access	Functional and technical specifications and reference software of DE4A-connector are available.

1.4 Sweden

1.4.1 Data consumer (pilot scenario DBA5 - Verksamt.se (PSC))

1.4.1.1 Pilot scenario description

Overview:

This use case deals with the enrolment of a company to a company portal in another Member State. The corresponding user journey is for example an Austrian company opening a branch in Sweden, using the Verksamt portal to register the branch and to apply for F-tax. For this purpose, the data consumer needs information (evidence) of the company involved, including evidence of its existence, legal form, location, contact information and type of business activity

Online procedure:

Sweden has no online procedure in production for registration of branches, the procedure is paper based. For piloting purposes an online eService will be developed.

Evidence exchanged:

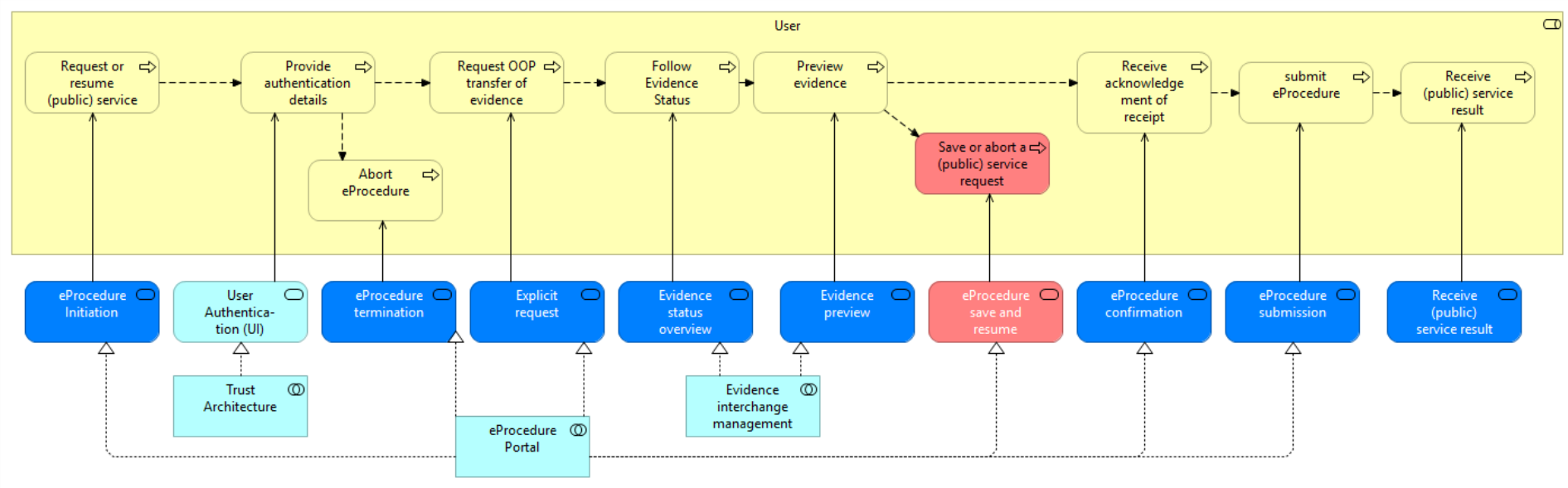
To be decided, company data / natural person data / powers declaration data (as described in the paper on the DBA data model; note: to be done as an elaboration on the data model in D4.5).

Roles:

Table 184: SE case: DC Scenario roles

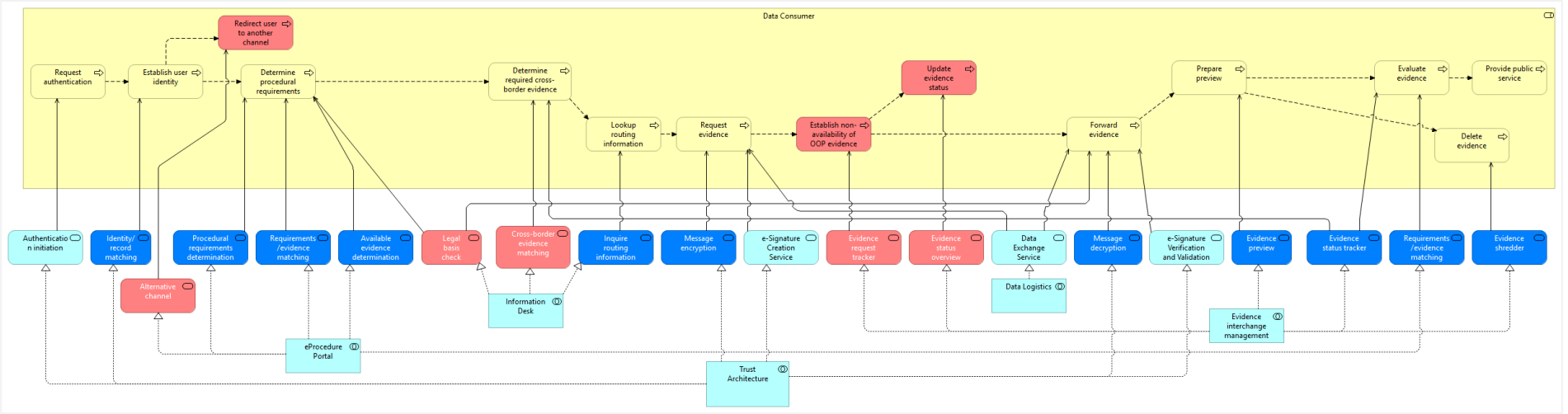
MS	Role	Organization
SE	Data transferor	Bolagsverket
	Data owner	Bolagsverket

1.4.1.2 Process design



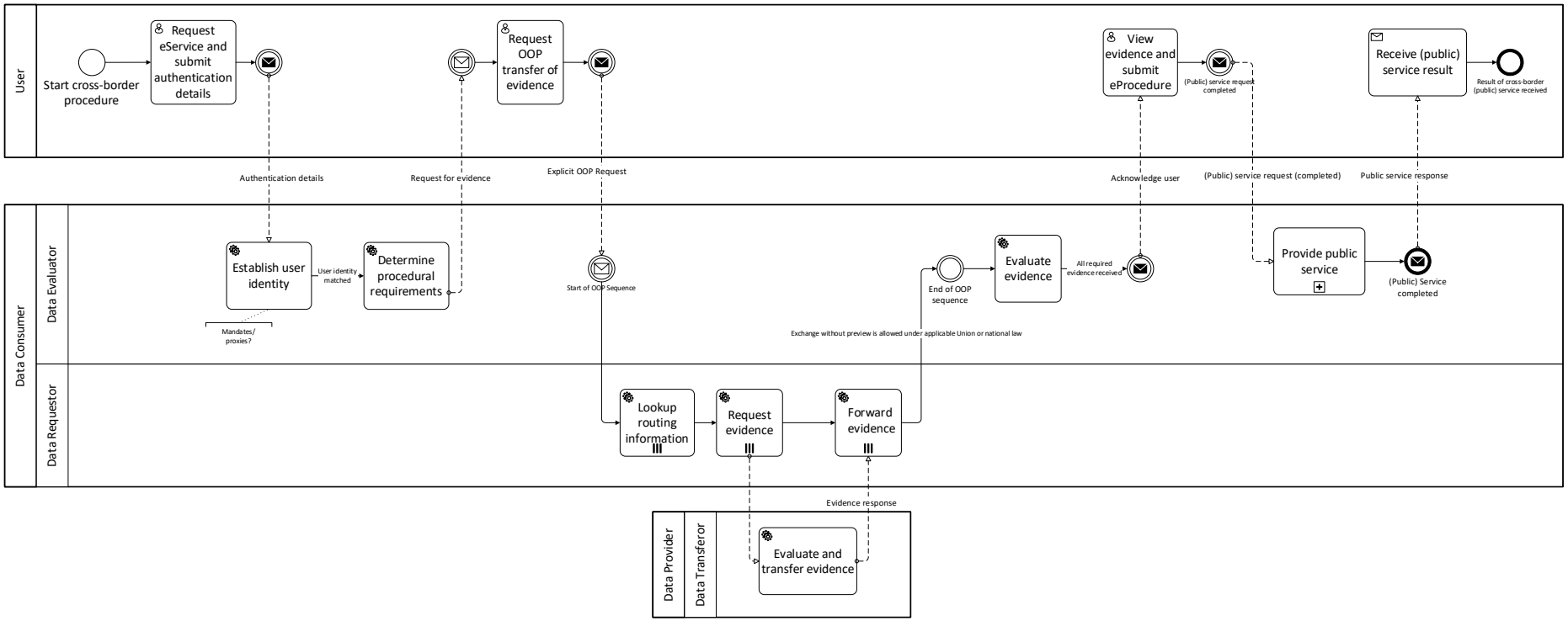
User Process for DBA, red activities are not in scope for Bolagsverket

Figure 84: SE case. DC Scenario, user process representation



DC Process for DBA, red activities are not in scope for Bolagsverket

Figure 85: SE case. DC Scenario representation



Simplified view of the DBA-process. For a complete view of the process, see DE4A D2.4 PSA

Figure 86: SE case. DC Scenario DBA process representation

Visual representation:

The process view above have been simplified for viewing reasons. Only the happy path is outlined where user is verified and all evidences exist. The explicit preview is omitted, the requested and received evidence will be prefilled in the submit form in the eService.

Description of process steps:

Table 185: SE case: DC Scenario process

Role	Process step	Description
User	Request eService and submit authentication details	*Start of process, user is requested to submit authentication details.*
User	Provide authentication details	*Includes identifying the company and optionally selecting the mandate to use (Member State specific).*
Data evaluator	Establish user identity	*Includes record matching and granting access based on powers validation*
Data evaluator	Determine procedural requirements	*Does probably not change. Determine which evidences are required for the eService.*
User	Request OOP transfer of evidence	*This is the users explicit request. The user should be made aware that he/she participates in a pilot.*
Data evaluator	Determine required cross-border evidence	
Data requestor	Lookup routing information	
Data requestor	Request evidence	*In case the OOP TS is offline, the company cannot be recognised by the DP, there is a time-out in retrieving evidence or the evidence is not available.*
Data requestor	Forward evidence	
Data evaluator	Prepare preview	*Formats structured data to a user readable version on screen.*
User	Preview evidence	*Includes approval to continue and option to deny (stops process) .* *We expect the user interface for this to be standardized by WP5.*
Data evaluator	Evaluate evidence	*Check whether all the required information is available. Formats structured data to a user readable version on screen.*
User	View evidence and submit eProcedure	*Includes approval to continue and option to deny (stops process – not shown). Submission of eProcedure.*
Data evaluator	Provide public service	Internal process for registering a branch.
User	Receive public service result	Notification sent to customer.

1.4.1.3 Wireframes

Figure 87: SE example. Welcome screen

Figure 88: SE example. Country selection screen

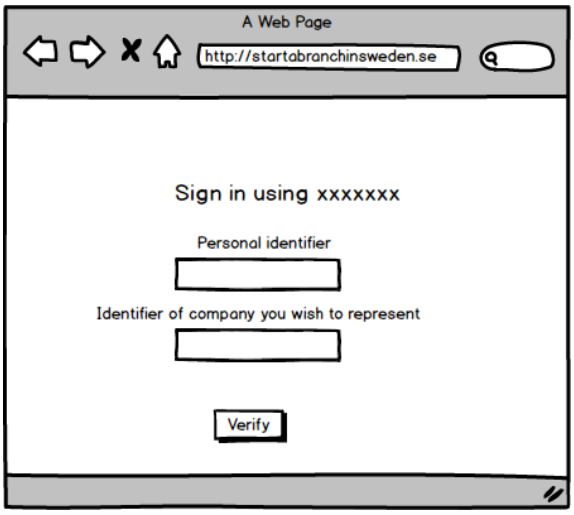


Figure 89: SE example. Login screen

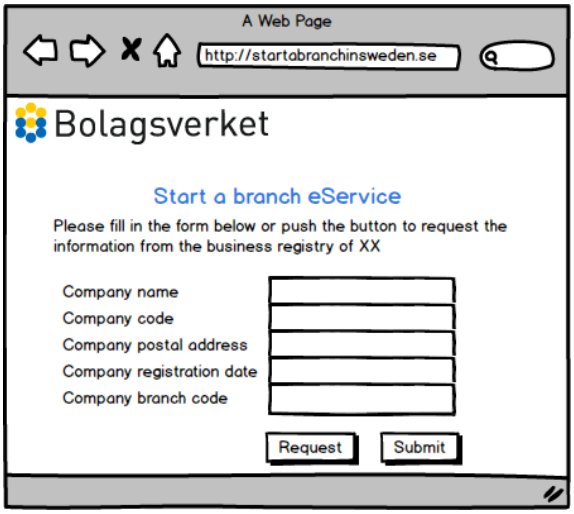


Figure 90: SE example. Start a branch eService screen

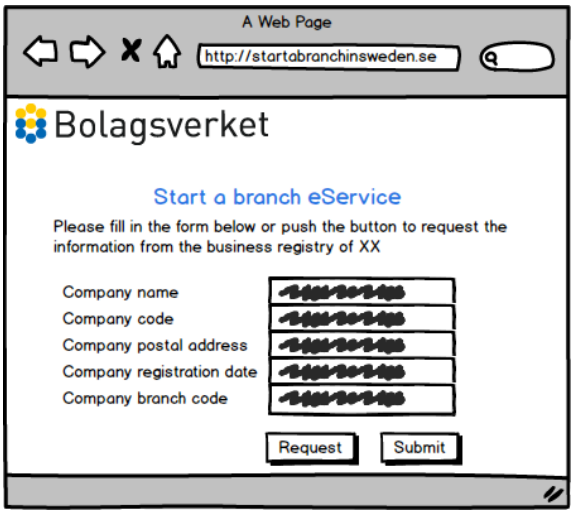


Figure 91: SE example. Branch information request screen

Figure 92: SE example. Process finished screen

1.4.1.4 Solution architecture

Visual representation:

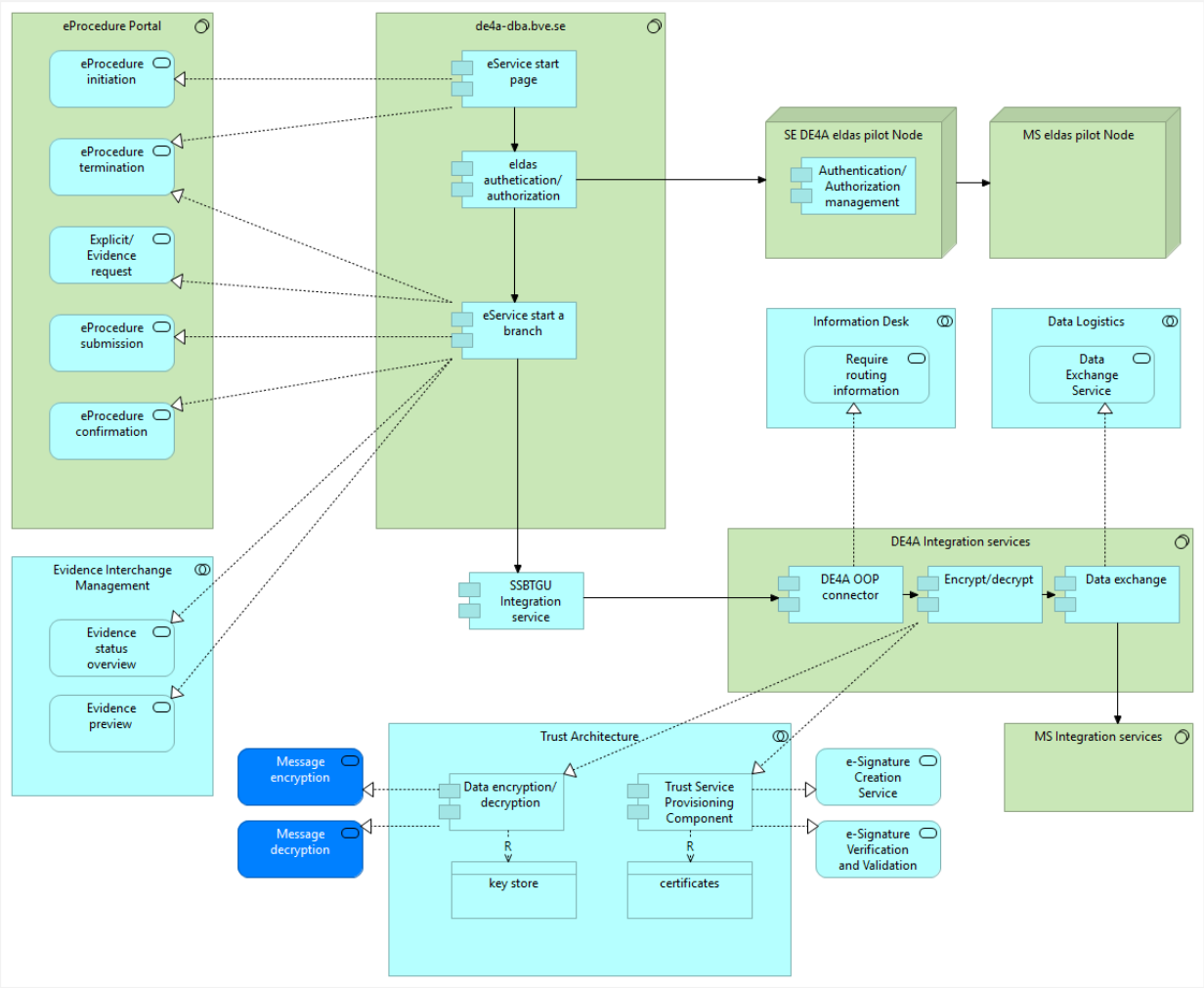


Figure 93: SE Case. DC Scenario Solution architecture

Mapping of MS applications on PSA reference architecture

Table 186: SE case: DC Scenario components

Application collaboration	Application component	Application service	Dba.bve.se	eIDAS node	DE4A Integration services
eProcedure portal	eProcedure Portal front end	eProcedure initiation Explicit request eProcedure termination eProcedure submission eProcedure confirmation New company registration	X	-	-
	Session management	eProcedure save and resume	-	-	-
	eProcedure rules engine	Procedural requirements determination Requirements/evidence matching	X	-	-
	Logging/Archiving	All services	X	X	X
Information desk	Evidence type translator	Cross-border evidence matching	X	-	-
	Evidence Map Editor		-	-	-
	Data service lookup	Inquire routing information	-	-	X
	Service registry editor		-	-	-
	Authorization controller	▸ Authority check ▸ Legal basis check	X	-	-
	Authorities editor		-	-	-
	Equivalent evidence		-	-	-
	Evidence Map		-	-	-
	Competent authorities		-	-	-
Evidence Interchange Management	Evidence interchange front-end	▸ Evidence status overview ▸ Evidence preview	X	-	-

Application collaboration	Application component	Application service	Dba.bve.se	eIDAS node	DE4A Integration services
	Evidence interchange back-end	▸ Evidence status tracker (2x) ▸ Evidence shredder	-	-	-
Trust Architecture	Trust Service Provisioning Component	▸ e-Signature Creation Service ▸ e-Signature Verification and Validation Service	-	-	-
	Identity Management Component	▸ Authentication initiation ▸ User Authentication (UI)	X	X	-
	Record matching	Identity/record matching	-	-	-
	Data encryption/decryption	▸ Message encryption ▸ Message decryption	X	-	X
	Mandates/powers	TBD in context of DBA pilot	-	-	-
Data logistics	Data Exchange Component	Data Exchange Service	-	-	X
	Data Exchange gateway		-	-	X

Description of existing MS application components to be used in the DBA-pilot:

Table 187: SE case: DC Scenario existing components

Application	Description
SSBTGU Integration service	Service that acts as a proxy and fetches requested information from several authorities in Sweden.

Description of new MS application components to be used in the DBA-pilot:

Table 188: SE case: DC Scenario new components

Application	Description
eProcedure Portal	A new simplified user interface for starting a branch in Sweden.
De4a.dba.bve.se	Backend to eprocedure Portal
eIdas pilot node	A new eIdas node for DE4A pilots
DE4A Integration Services	Includes all components needed for integration; connector, SMP., SML, DSD etc.

1.4.1.5 Design Choices

Table 189: SE case: DC Scenario design choices

#	Application component	Design choice for first pilot run	Motivation
1	eProcedure portal – session management	The application service 'eProcedure save and resume' will not be implemented.	The Doing Business Abroad pilot only implements an uninterrupted process (not 'save and return later to continue' but 'abort and return later to restart').
2	Information desk – Evidence type translator	The application service 'Cross-border evidence matching' is not needed and will not be implemented.	To reduce complexity, the evidence 'DBA company data' will be acknowledged by all participants.
3	Information desk – Authorization controller	The application services 'Authority check' and 'Legal basis check' will not be implemented.	Reduce complexity.
4	Evidence Interchange Management – front end	The application service 'Evidence status overview and preview' will be implemented in the eProcedure portal. Status will only be indicated by an indicator and preview will be in the form of prefilled text fields.	Reduce complexity.
5	Trust Architecture - Record matching	'Identity/record matching' is not needed for the DC.	
6	Trust Architecture - Data encryption/decryption	'Data encryption/decryption' is implemented between the OOP-nodes of the participating members states	Conform DE4A-standards.
7	Trust Architecture - Mandates/powers	Powers-validation is implemented with the implicit uses of eIDAS scheme. When eIDAS scheme contains legal person attributes full powers are assumed.	SEMPER will not be used.

1.4.1.6 Gap Analysis

Service provider components

Table 190: SE case: DC Scenario SP components

Application component	Change description	Change owner	Precondition
eProcedure Portal	A new eService for starting a branch is needed.	Bolagsverket	

Application component	Change description	Change owner	Precondition
De4a.dba.bve.se	The business logic for the portal must be set up.	Bolagsverket	
DE4A Integration Services	A new integration layer is needed to communicate with other MS and request evidences. Includes the deployment of OOP components.	Bolagsverket	
SSBTGU Integration service	The service must be updated to access the DE4A Integration Services.	Bolagsverket	
Powers service	A new service is needed to look up powers for authenticated user.	Bolagsverket	

National components

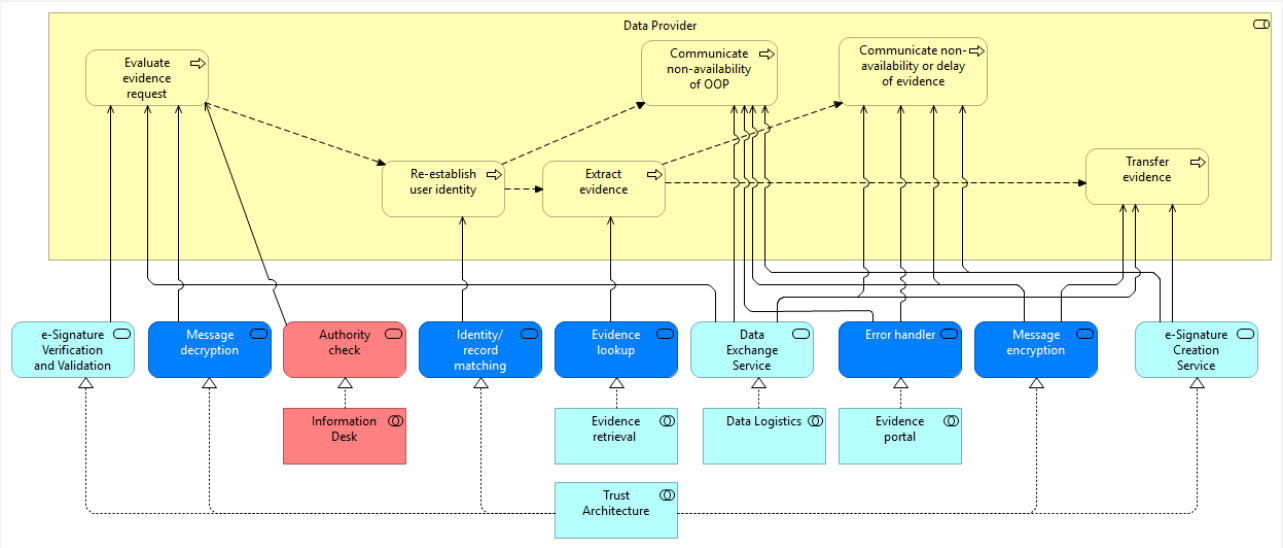
Table 191: SE case: DC Scenario national components

Application component	Change description	Change owner	Precondition
eIDAS node	A new eIDAS node needs to be set up for the pilot. Bolagsverket depends on the Swedish eIDAS board to get it up. The node shall also support authorization on no power/full power level.	Digg	A powers service must be established at Bolagsverket in order to support authorization from the eIDAS node.

1.4.2 Data provider

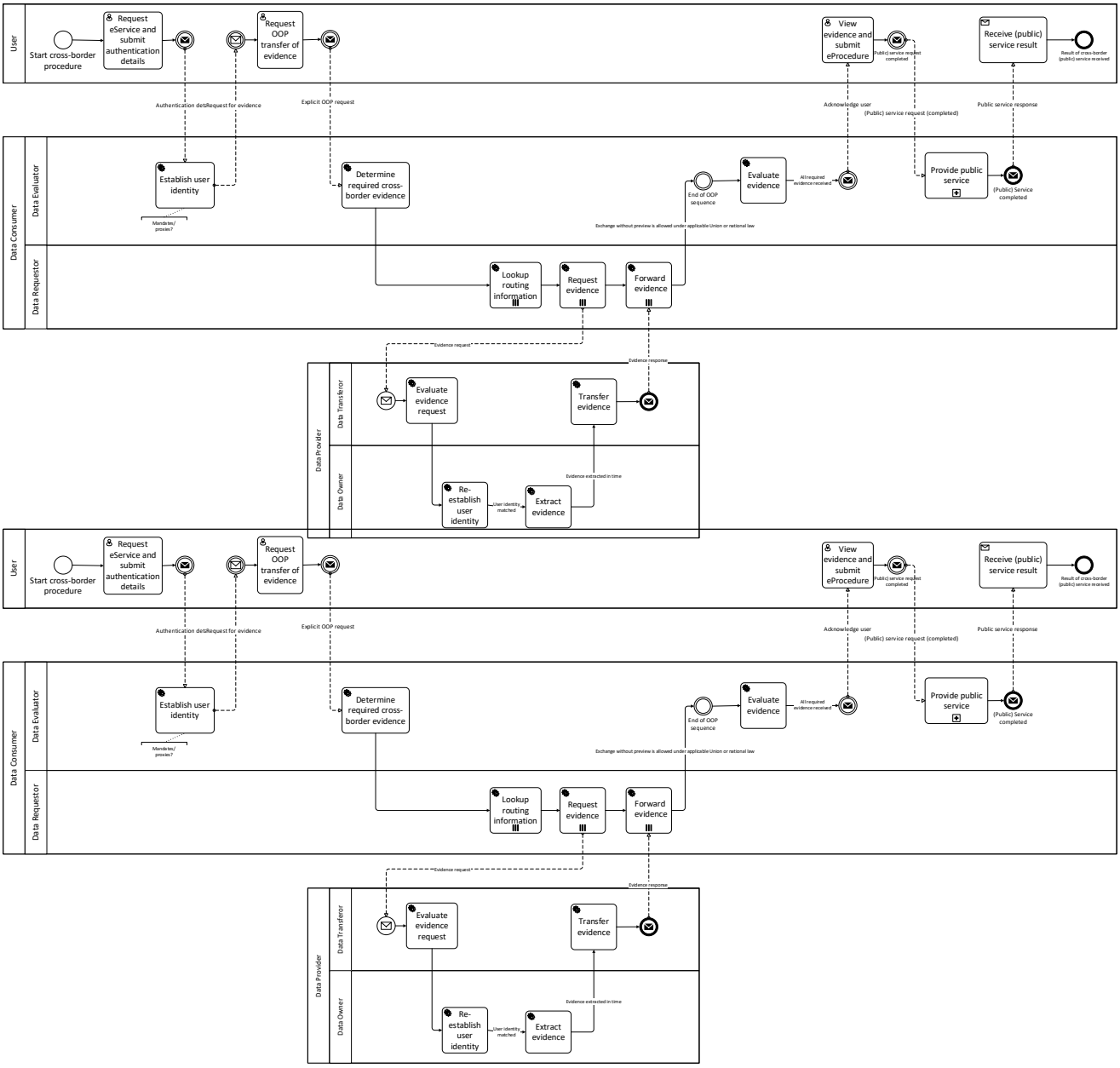
1.4.2.1 Process design

Visual representation:



DP Process for DBA, red activities are not in scope for Bolagsverket

Figure 94: SE Case. DP Scenario


User
Start cross-border procedure
Request eService and submit authentication details
Request OOP transfer of evidence
View evidence and submit eProcedure
Receive (public) service result
Result of cross-border (public) service received
Authentication dets
Request for evidence
Explicit OOP request
Acknowledge user
(Public) service request completed
Public service response
Data Consumer
Data Evaluator
Data Requestor
Establish user identity
Mandates/ proxies?
Determine required cross-border evidence
End of OOP sequence
Evaluate evidence
All required evidence received
Provide public service
(Public) Service completed
Exchange without preview is allowed under applicable Union or national law
Lookup routing information
Request evidence
Forward evidence
Evidence request
Evidence response
Data Provider
Data Transferor
Data Owner
Evaluate evidence request
Transfer evidence
Re-establish user identity
User identity matched
Extract evidence
Evidence extracted in time

User
Start cross-border procedure
Request eService and submit authentication details
Request OOP transfer of evidence
View evidence and submit eProcedure
Receive (public) service result
Result of cross-border (public) service received
Authentication dets
Request for evidence
Explicit OOP request
Acknowledge user
(Public) service request completed
Public service response
Data Consumer
Data Evaluator
Data Requestor
Establish user identity
Mandates/ proxies?
Determine required cross-border evidence
End of OOP sequence
Evaluate evidence
All required evidence received
Provide public service
(Public) Service completed
Exchange without preview is allowed under applicable Union or national law
Lookup routing information
Request evidence
Forward evidence
Evidence request
Evidence response
Data Provider
Data Transferor
Data Owner
Evaluate evidence request
Transfer evidence
Re-establish user identity
User identity matched
Extract evidence
Evidence extracted in time

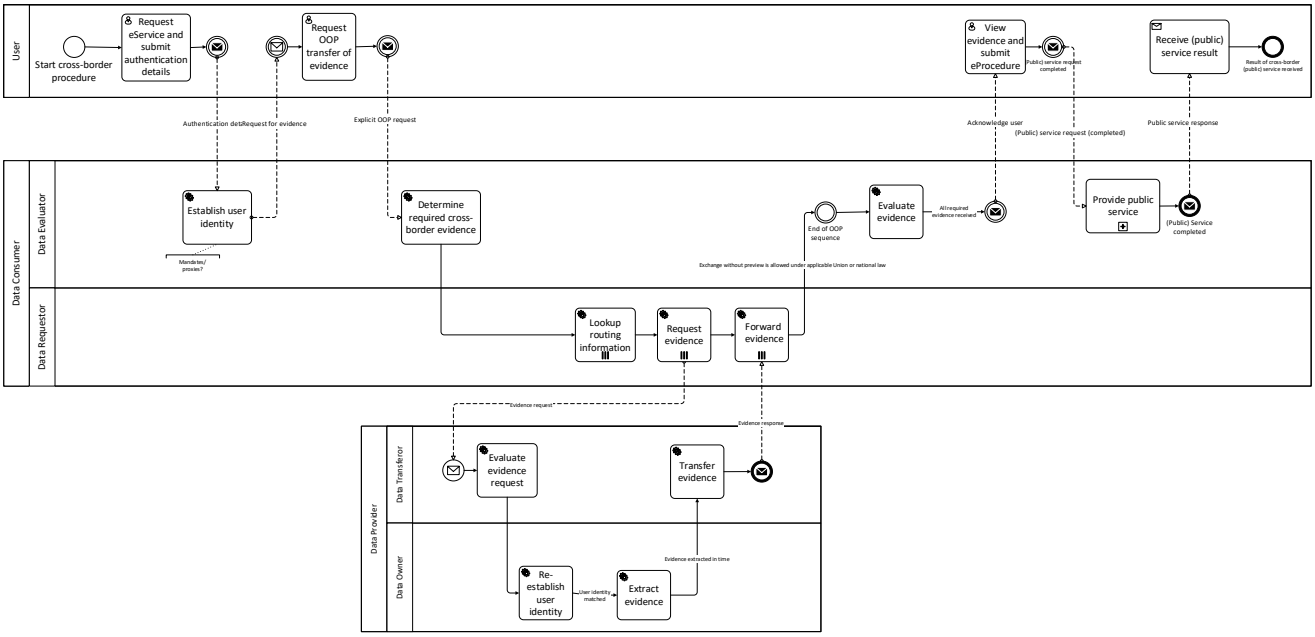


Figure 95: SE Case. DP Scenario Solution architecture process

Description of process steps:

Table 192: SE case: DP Scenario process

Role	Process step	Description
Data transferor	Evaluate evidence request	
Data owner	Re-establish user identity	*Should be interpreted as: check whether the company identifier can be recognized by the data owner.*
Data owner	Extract evidence	*All evidences exist in the first iteration of pilot*
Data transferor	Transfer evidence	

1.4.2.2 Solution

Visual representation:

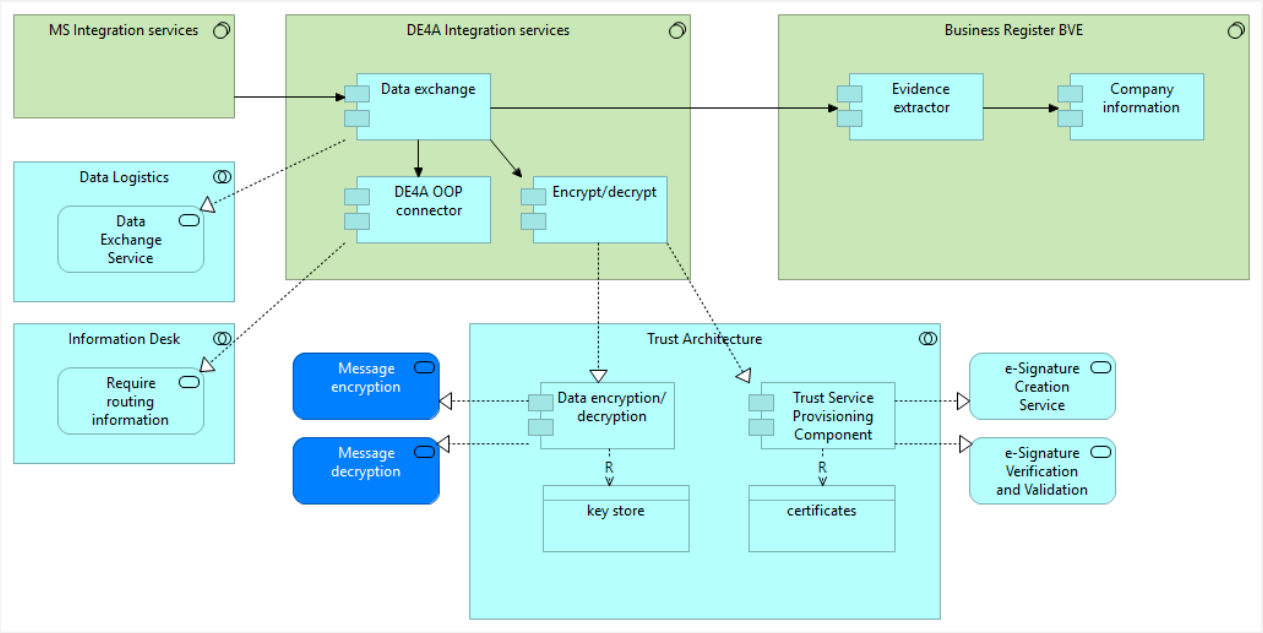


Figure 96: SE Case. DP Scenario Solution architecture

Mapping of MS applications on PSA reference architecture

Table 193: SE case: DP Scenario applications

Application collaboration	Application component	Application service	DE4A Integration Services	Business register BVE
eProcedure portal	Logging/Archiving	All services	-	-
Information desk	Authorization controller	▸ Authority check ▸ Legal basis check	-	X
Trust Architecture	Trust Service Provisioning Component	▸ e-Signature Creation Service ▸ e-Signature Verification and Validation Service	-	X
	Record matching	Identity/record matching	-	X
	Data encryption/decryption	▸ Message encryption ▸ Message decryption	X	-
Data logistics	Data Exchange Component	Data Exchange Service	X	-
	Data Exchange gateway		X	-
Evidence retrieval	Evidence query	Evidence lookup	-	X
	Evidence editor		-	-
	Evidence query to portal		-	-

Application collaboration	Application component	Application service	DE4A Integration Services	Business register BVE
Evidence portal	Evidence portal back-end	Data Exchange Service	-	-

Description of existing MS application components to be used in the DBA-pilot:

Table 194: SE case: DP Scenario existing components

Application	Description
Company information	Business register with requested company information exist.

Description of new MS application components to be used in the DBA-pilot:

Table 195: SE case: DP Scenario newcomponents

Application	Description
DE4A Integration Services	Includes all components needed for integration; connector, SMP., SML, DSD etc.
Evidence extractor	Maps information from Company information to requested format.

Design choices

Table 196: SE case: DP Scenario design choices

#	Application component	Design choice	Motivation
1	Evaluate evidence request	No authority check will be made. All requests will be trusted.	Pilot environment is controlled and restricted and business registry contains publicly available information.
2	Re-establish user identity	Re-establishing will only use legal person identifier, no natural person identifier.	[…]

1.4.2.3 Gap analysis

Service provider components

Table 197: SE case: DP Scenario SP components

Application component	Change description	Change owner	Precondition
DE4A Integration Services	A new integration layer is needed to communicate with other MS and request evidences. Includes the deployment of OOP components.	Bolagsverket	

Application component	Change description	Change owner	Precondition
Business register BVE	A new service will be added to extract the requested evidence and map it to DE4A-format.	Bolagsverket	