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# The EU Services Directive - Reusing Existing Resources In Public Sector Interoperability

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# THE EU SERVICES DIRECTIVE - REUSING EXISTING RESOURCES IN PUBLIC SECTOR INTEROPERABILITY

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## Abstract

The paper presents a case study of an ongoing implementation project in the framework of the European Union Services Directive. In the German federal state of Brandenburg, authorities are preparing a common taxonomy of professions and industries for general use and in particular for business registration. It is a measure for the creation of a point of single contact as required in the Services Directive. Existing code lists and taxonomies are used as "semantic interoperability assets" and consolidated for the new purpose with the help of the Semantic Interoperability Centre Europe (SEMIC.EU). The unique contribution of the strategy chosen in the case is the combination of real-life feasibility and the instant creation of interoperability through semantic harmonization with an existing 20-language catalogue and an established classification of business activities.

**Keywords:** *Services Directive, Semantic Interoperability, Taxonomies, Business registers*

## 1 INTRODUCTION

The European Union's Services Directive was published and entered into force in December 2006. It sets the date for transposition to national law including the necessary infrastructures to December 28, 2009. This case study presents a strategy in semantic measures needed for the implementation of the directive. With the announced date of full implementation of electronic services supporting the services infrastructure being the end of 2009, all Member States are currently developing the necessary infrastructures. This requires intense efforts in creating interoperability, especially of the semantic kind. In the case describe in this paper, the implementing authority is the Ministry of the Interior of the German federal state of Brandenburg.

The project represents one specific part of a set of implementation measures concerning the Services Directive. They involve, among others, standardisations and the definition of basic and specific data for

- tax offices
- trade associations
- the Federal Employment Agency
- health insurance.

The case presented in this paper has a clear pan-European dimension. It is a project of the coaching service of the Semantic Interoperability Centre Europe, SEMIC.EU. This European Commission service was established under the programme IDABC ("Interoperable Delivery of Services to Administrations, Businesses and Citizens"). In this project, SEMIC.EU provides coaching on methodology advice and recommends the existing source interoperability assets for a business registration index which is to be defined.

This practice case illustrates strategies to tackle the challenge which the complexity of semantic harmonisation means for electronic government.

## **2 PROBLEM AND APPROACH**

Business registration infrastructures are an important element of Services Directive implementation since the directive establishes the right of service providers to register their business in any Member State remotely, i.e. through electronic processes, and with only one single point of contact.

The policy paper issued by the Internal Market Directorate General “Services Directive implementation enters decisive phase” summarises these provisions stipulated in the directive:

“The possibility to complete all procedures through 'Points of Single Contact' has to be available at a distance and by electronic means, meaning that Member States will have to provide for eGovernment services that can also be used across borders – by applicants who reside and providers who are established in other Member States. It is the first time that Member States are under a legal obligation to put in place such eGovernment services and make their use possible across borders. This is a particularly challenging objective and the Commission is closely assisting Member States in finding a common approach to the key issues linked to it such as the cross border use of electronic signatures“ (European Commission, DG Internal Market 2008).

Across Europe, the administrative effort is managed differently depending on the government structure of the respective country. In Germany, the coordination management in this context is transferred from the federal level to state level. The states take on single tasks which derive from implementation requirements.

This case presents the preparations of the federal state of Brandenburg for the setup of a “point of single contact”. In the state of Brandenburg the implementation of electronic processes for service providers and the exchange of relevant data between authorities are coordinated by the Ministry of the Interior.

The ministry is currently developing a taxonomy based on which trade professionals can register a business in Germany. One of the reasons for this need is the required establishment of a point of single contact for service providers and recipients as a consequence of which a consolidated classification of professions and trades is needed in the field of services.

The semantic challenge is to find an appropriate list of business categories that is convenient to use but complex enough to be capable of representing any possible business that European service providers (and other industry) may register in the state and which – at the same time – inherently has the potential to be easily updated to future requirements and keeping the capacity to hold information that other interested parties in any Member State might eventually request.

## **3 METHOD**

The following paragraphs outline the three-step approach taken in the development of a central business registration index in Brandenburg: An analysis of the actual requirements, the identification of reusable interoperability assets and, finally, the semantic consolidation of the resources to meet the requirements.

### **3.1 Step one: Requirements analysis**

Requirements are in general derived from the demands stipulated in the Services Directive itself, but also from local conditions and administrative structures.

Article 5 establishes an obligation for the Member States to simplify their procedures if necessary and to accept a document or certificate from another Member State.

Article 7 establishes an obligation for the Member States to ensure that the information is easily accessible to providers and recipients through the points of single contact.

Article 8 of the directive calls for each Member State to set up a complex internal organisation which should interact with that of its partners:

“Member States shall ensure that all procedures and formalities relating to access to a service activity and to the exercise thereof may be easily completed, at a distance and by electronic means, through the relevant point of single contact and with the relevant competent authorities.

[...]

„The Commission shall, in accordance with the procedure referred to in Article 40(2), adopt detailed rules for the implementation of paragraph 1 of this Article with a view to facilitating the interoperability of information systems and use of procedures by electronic means between Member States, taking into account common standards developed at Community level.“ (European Communities 2006).

It is one of the directive’s key objectives to foster pan-European cooperation in public administration.

In its Handbook on Implementation, the European Commission formulates this:

“The implementation of the obligation undertaken in Article 8 by the end of 2009 will be a considerable challenge for Member States, which should increase their already ongoing efforts to work towards interoperable e-Government services for businesses. Member States are encouraged to build upon the existing initiatives. Indeed, the obligation in the Services Directive should be seen as a chance to boost current efforts and to help Member States to focus and deliver the objectives they have set themselves as part of their e-Government work” (European Commission 2009).

The measures have to take into account both the national and the European level: Member States must implement the required target architectures according to article 6. Building blocks of the implementation solutions shall be reusable by other information systems across Europe.

The official implementation guidelines for Germany call for the points of single contact to be able to “query, store and assess the individual situation of the interested service provider. From a German perspective, this task can not be fulfilled by an exclusively electronic solution in the form of a ‘virtual’ institution. The single points of contact must – even in electronic procedures – be fully ready for dialogue. This is of particular importance to foreign service providers that often have specific questions (e.g. differing foreign characteristics of professions, special foreign types of company / societies, insecurity in acknowledgement of foreign language certificates etc.)” (Federal Ministry of Economics and Technology 2007, p. 4, own translation).

Translated into the concrete case, the requirements can be summarised as follows:

- preference for an integration of existing information resources and services over the development of new administrative portals. A reuse of existing resources is clearly aimed at.
- In the medium term, content syndication must be achieved: an information management based on federated (i.e. centralised as well as de-centralised) resources in the context of the EU.
- The target taxonomy must incorporate several languages.
- It must contain semantically unambiguous specifications of professions as well as trades and industries
- It must be ready for data exchange across state borders, i.e. it needs to support European data exchange.
- The target list must be kept as short as possible. Therefore the source list must be consolidated.

The single responsibility of the respective authorities renders a controlled vocabulary solution adequate. More specifically, a taxonomy as a well-defined information system can deliver the needed guidance towards the appropriate information to the entrepreneurs wishing to register their business while preserving a reasonable length and constrained complexity.

### 3.2 Step two: Identification and analysis of suitable source vocabularies

In the early stages of this project, existing taxonomies and other vocabularies relevant to the case were considered for their suitability for integration and implementation.

Their respective strengths and weaknesses were assessed and weighted. Due to the differences in focus and, hence, also in their capacities concerning this case of use, it was determined that the target classification of businesses to be registered will be based on an existing index and harmonised with two European de facto standards.

The index resulting from the consolidation of this source will represent specifically those businesses which can be registered in Brandenburg. However, for the requirements spelled out above to be met, two further vocabularies were identified:

The second reference vocabulary is delivered by the NACE Code (Statistical Classification of Economic Activities in the European Community).

#### 3.2.1 Requirement “reuse of existing models”: *Business register catalogue of the Land of North Rhine-Westphalia*

The starting point is a simple alphabetically sorted code list, provided by another German federal state, North Rhine-Westphalia in which 1.500 professions and trades are listed in German language without any semantic specification.

The advantage of reusing an existing list from a German federal state is the similarity in responsibilities for this list as the administrative structures are compatible. In any German federal state the Chambers of Industry and Commerce as well as the Chamber of Crafts will act as reference institutions for the definition of business classes in the respective state.

#### 3.2.2 Requirement “multilingualism”: EURES taxonomy

The European Job Mobility Portal provided by [EURES](#) (“European Employment Services”) applies a comprehensive classification of occupations and skills. The specifications of professions herein are available and already matched for 20 European languages. The latter fact is an invaluable asset for future information exchange and semantic processing. The taxonomy contains more than 10.000 entries in 20 languages.

Using the EURES taxonomy as a source classification, however, is not only convenient as it delivers reliable mappings between 20 European languages. It also poses another challenge: The reconciliation of occupations and business categories, two related but clearly distinct semantic realms.

#### 3.2.3 Requirement “pan-European harmonisation”: NACE

Since the EURES taxonomy delivers the opportunity of multilingual mapping, it does not fulfil the requirement to match all business activities applicable for registration, especially in the framework of pan-European service provision. To make up for this shortcoming, NACE was identified as the second reference standard which the pragmatically shortened index to be established must be harmonised with. NACE, the “Statistical Classification of Economic Activities in the European Community” (“Nomenclature statistique des activités économiques dans la Communauté européenne”) is a European classification of businesses based on a regulation by the Council of Ministers of the European Communities (European Communities 1997).

The current version of NACE, Rev. 2, was implemented in 2008. The catalogue is organised hierarchically and contains detailed descriptions (“semantic statements”) specifying the precise semantics which the items cover and also specifying what they exclude. These semantic statements elevate the value of the nomenclature as a reusable interoperability asset considerably. Reusability is in many cases dependent

on the meta-descriptions of a semantic building block, especially if the statements clarify what the semantic scope of a given entry does not cover.

It adds further to the value of NACE that it is a derived classification of ISIC, the International Standard Industrial Classification of All Economic Activities, issued by the United Nations (United Nations 2008).

The structure and content of NACE Rev. 2 were developed in cooperation with national European statistical institutes, Directorates General of the European Commission as well as European business and trade associations. It is a significant feature that while its scope is clearly pan-European, NACE Rev. 2 also covers economic activities which are not relevant in each European country. Examples include categories in agriculture, mining and quarrying, spacecraft manufacturing and others.

The incorporation of and mappings to NACE are not only convenient but virtually mandatory: NACE is the basis on which authorities define their area of economic activity in the recently established Internal Market Information System (IMI).

In order to support the flow of information in the Internal Market and specifically with regard to the free movement of services, the European Commission developed IMI. It is designed to offer the necessary infrastructures which let Member States provide mutual assistance and information exchange. A pilot project for the implementation of the Services Directive was launched in February 2009. It is tailored to model services and does not yet aim at any harmonisation of the service descriptions and trades themselves. Rather, it provides tools for mutual information in the form of pre-translated catalogues of questions on the base of which the Member States can request references and information from one another.

IMI aims at an interoperable information infrastructure for bilateral information sharing, whereas SEMIC.EU's implementation project with the state of Brandenburg focuses on the matter itself and its meaning. Thus, they can be viewed as complementary activities serving the same end, the advancement of the Internal Market in the European Union.

The method for a both feasible and sustainable solution to meeting the requirements is the application of an existing classification, harmonising it with other controlled vocabularies, ideally *de facto* standards, and an option to map to other languages as Europe-wide applicability is a core objective.

Applying two widely used and established interoperability assets is a key strategy to fulfil this requirement – requests for clarification of business classes, service definitions etc. can thus always be connected to Europe-wide reference classifications – and in the case of EURES – at the same time in 20 of the official languages of the European Communities.

### **3.3 Step three: Consolidation and mapping**

The fact that more than one original source is used for the targeted generation of a binding taxonomy of business activities causes a demand for mapping rules for similar cases or entries in the respective source taxonomies.

Similarity values are calculated as a means to determine whether the necessary similarity thresholds for the implementation context – Europe-wide accessibility of a one-stop business registration contact point – are met with each entry in the consolidated target taxonomy.

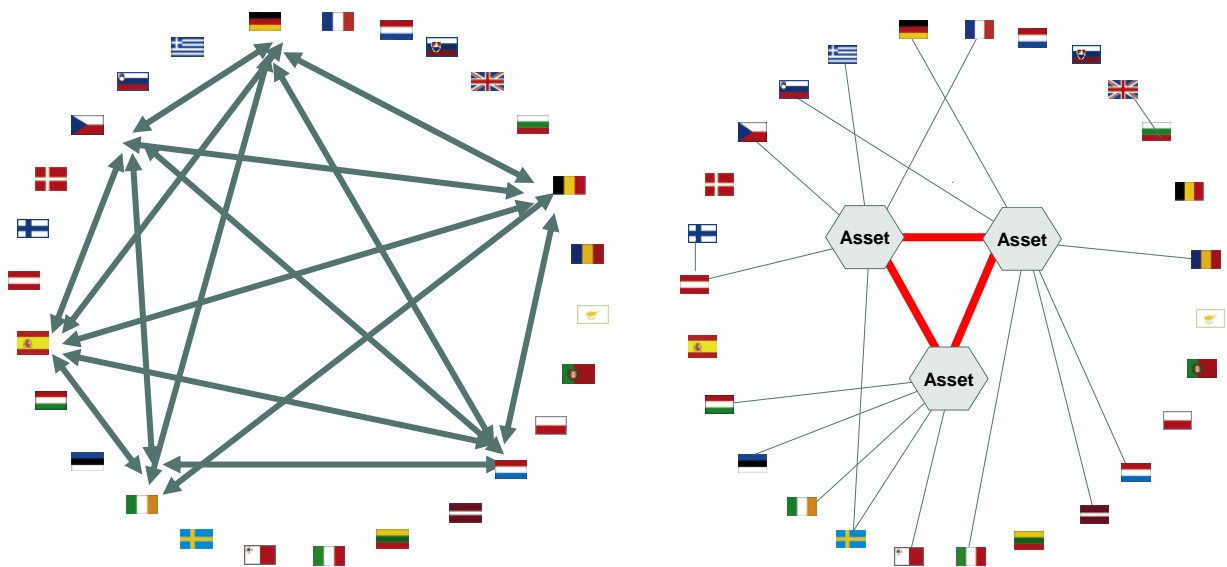


Figure 1. *Multiple bilateral information flows vs. data exchange via interoperability assets*

After the expert revision of the source index from North Rhine-Westphalia, the consolidated list of trades and businesses (including service providers) is optimised inasmuch as it is no longer than necessary. All entries which do not apply or do not have an administrative reference in the state of Brandenburg are eliminated. This, however, is only the first step towards implementation-readiness.

The major functional task here is to identify: What do the terms listed in these classifications actually refer to? Meaning in this context is an appropriate and accurate representation of a potential service or profession for its registration with the authorities. Any possible service must be covered while at the same time, the concepts of the services and business activities must be compatible with registers already in use and relevant to the business processes related to service provision in Germany.

#### 4 SUSTAINABILITY AND REUSABILITY

The decisive step towards sustainability and reusability at the semantic level is taken by identifying semantically similar entries in both the multilingual EURES taxonomy and the semantically rich NACE standard. By this harmonisation, the new index becomes incrementally extensible to any conceivable need that might occur over time.

In order to keep the developed solution sustainable, a procedure for the maintenance of the system needs to be found. Any taxonomy or ontology as a representation system of real-life conditions must constantly be adapted to the changes of the context they are used in. The most obvious example in the context of business activities and service provision would be emerging new services based on new business models and as a result of technological progress.

The concept of the pivot solution adds significantly to the sustainability of the target system. Any change in one of the classifications / systems related to the pivot solution must be able to map their amended entries to the central system so other related systems – equally updated or not – remain capable of retrieving the matching information to their own classification systems.

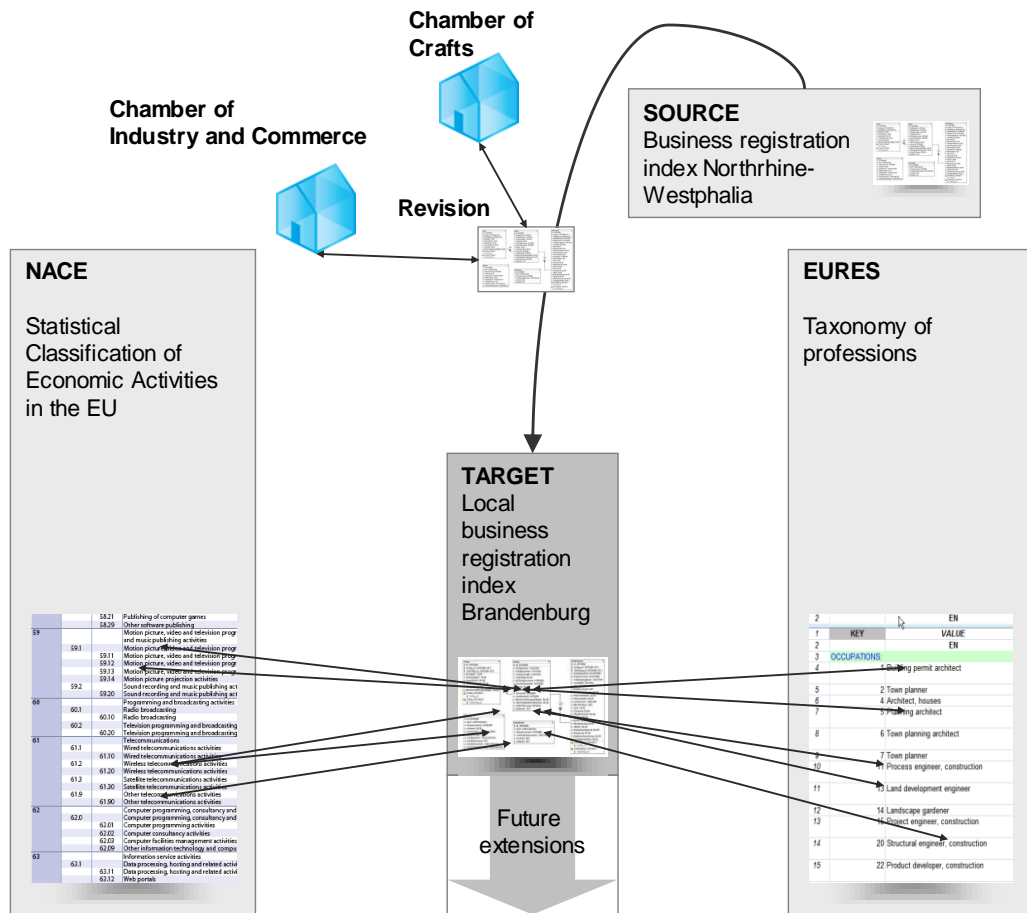


Figure 2. Potential for future extensions of the practice solution by relation to existing comprehensive sources

Interoperability, however, is not restricted to the mapping capabilities which this approach generates. It also allows for convenient statistical evaluations on a European scale as it delivers access to comparable data at different levels of administration.

## 5 THE ROLE OF SEMIC.EU AS A PAN-EUROPEAN SERVICE

The Semantic Interoperability Centre Europe operates as a coordinated network of eGovernment projects and communities. The service calls on projects and individuals alike to share their building blocks for semantic interoperability (referred to as “interoperability assets”) or to develop them with support from the community built around SEMIC.EU. And it facilitates their reuse.

A standardised clearing process, supported by platform functionalities, governs the evolution of the data models, XML schemas, code lists, ontologies and taxonomies which are shared through the open repository.

As a general rule, the Semantic Interoperability Centre Europe follows a collaborative approach in creating semantic interoperability, especially in the framework of its coaching services. This is due to the fact that semantic interoperability as represented by this case of classification of professions and trades is highly relevant in various contexts and at all levels of government across Europe.



A unique feature setting SEMIC.EU apart from other repositories is the provision of a complementary coaching service to eGovernment projects in their development of semantic interoperability solutions, regardless of the level of government and scope.

In the project discussed here, SEMIC.EU facilitates the compliance of a single player, a German federal state, with the guidelines established at a higher level of governance and derived from the pan-European legislation which is the directive itself. From the point of view of the Ministry, the cooperation with a pan-European service means that it follows the general intentions of the Services Directive.

The assistance offered to the Ministry comprises several aspects:

Clearing: Assistance in the evaluation of existing catalogues and taxonomies

- Testing of mapping and integration capacity
- Risk analysis for “semantic conflicts”
- Provision of the SEMIC.EU repository functionality
- Backup of the catalogue mapping with the versioning service

Coaching: Assistance in the integration of European taxonomies

- Testing of reusability in the context of the EU-DLR
- Description of the modification and integration path
- Conceptual support in the integration

Community: Provision of a community of practice

- Contacts to cooperation and exchange partners
- Provision of an exchange platform
- Taking on responsibility for coordination tasks between different European projects

The cooperation of regional, national and European institutions in this case of the business registration index development is an example of practical cross-domain modification and re-implementation of already generated interoperability solutions.

The reuse approach chosen by the Ministry and SEMIC.EU yields a number of advantages: Through the use of NACE and EURES taxonomy, the Brandenburg eGovernment project can tap into the multilingual and semantic properties of two established interoperability assets. In addition, it can capitalise on the semantic descriptions found in these assets for the improvement of its own services (an implicit evaluation of its own assets). And lastly, semantically specified cross-references between its taxa can now be included. This will enhance the quality of trade and branch office classifications.

## **6 CONCLUSION: REUSE, EXTENSIBILITY AND STEPS AHEAD**

The example of the preparation of German public administration for the final implementation of the EU Services Directive illustrates the opportunities of an open approach which is structured and at the same time guided by a comprehensive framework of rules and quality criteria.

This case study is also a litmus test for the capability of the quality framework and procedures implemented with the European Commission's Semantic Interoperability Centre Europe.

At the technical level, the implementation measures described are also a compelling example of the fluidity of the subject matter which is a defining feature of the semantic aspects of interoperability. In tackling these issues, the "negotiation of meaning" between several actors within certain communities of practice – often with legal ramifications – proves to be a pivotal factor in the creation of semantic interoperability. A conclusion drawn early in the project based on the legal requirements is that sustainable interoperable solutions must always anticipate future amendments and alterations. In public administration and eGovernment no solution which is valid at only a single moment in time can be considered useful.

Even though it was technically only demanded to enable the centralised registration of businesses, the authorities chose to request coaching by SEMIC.EU and to reuse two existing reference classifications in a move to provide for a sustainable and interoperable solution. The rationale behind this strategy is a pragmatic approach to the initial implementation – only those trades and services can be registered which are actually represented in the state of Brandenburg – with a view to future extensions and a reliable and interoperable scalability of the business register. This goes along with a deliberate self-affiliation to other European as well as pan-European structures of public administration.

As the project is ongoing, the results have yet to be presented. Likewise, the reuse of the strategy laid out in this paper, will have to be revisited after the implementation project is completed.

The Semantic Interoperability Centre Europe promotes the idea of mutual benefit for both the provider and the recipient of interoperability assets. The gains in comparison to autonomous approaches are easily conceivable. During the following stages of the project and in its reuse, the following criteria will define the success of the approach:

- The required processes for the maintenance and further development of taxonomies must be defined.
- Theoretical considerations regarding the solution of semantic conflicts in the integration of multi-level taxonomies are applied for practical advice.
- Aimed at the larger context of the project, concepts and procedures are defined for the creation of regional/national rooms for manoeuvre in the cooperative use of central taxonomies (pivot concept).
- In this specific case, the integration of existing vocabularies requires a description of the sustainable development and maintenance processes for collaborative taxonomy developments which can be deployed in many different European eGovernment projects.

The strategic approach depicted above is not only suitable for the particular case. It can easily be adopted by other integration projects aimed at readiness for inclusion in European administrative structures. The methodology applied is exemplary for flexible solutions as they are needed for eGovernment. The coupling of semantic assets like registers, taxonomies, ontologies with pivot structures – ideally already developed ones – is an indispensable strategic building block of any European eGovernment implementation measure.

## References

- Ducass, Alain (2009), Large Scale Pilot SPOCS – Simple Procedures Online for Cross-Border Services. Paper presented at Conference, Oslo, May 19th
- European Commission, DG Internal Market (2008). Services Directive implementation enters the decisive phase. Single Market News (Stamatopoulos P. Ed.), 51 (3), pp. 11-14
- European Commission, DG Internal Market (2009). User Handbook – Internal Market Information System
- European Communities (1997). Council Regulation (EC) No 322/97 of 17 February 1997 on Community Statistics. Official Journal of the European Communities No L 052
- European Communities (2006). Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on services in the internal market. Official Journal of the European Union, No L 49 (L 376)
- European Communities (2008). NACE Rev. 2. Statistical classification of economic activities in the European Community. Eurostat Methodologies and Working papers. Publications Office of the European Communities, Luxembourg
- Federal Ministry of Economics and Technology (2007). Europäische Dienstleistungsrichtlinie (RL 2006/123/EG): Umsetzungspflichten und Sachstand. [source: <http://www.dienstleistungsrichtlinie.de/DLR/Redaktion/PDF/pflichtenheft-umsetzung-dienstleistungsrichtlinie,property=pdf,bereich=dlr,sprache=de,rwb=true.pdf>]

- SEMIC.EU (2008). Vision of the Clearing Process. [<http://www.semic.eu/semic/view/documents/vision-of-the-clearing-process.pdf>]
- SEMIC.EU (2009). Study on Multilingualism. [<http://www.semic.eu/semic/view/documents/multilingualism-study.pdf>]
- SEMIC.EU (2009a). Study on Methodology. (unpublished)
- United Nations (2008), International Standard Industrial Classification of All Economic Activities, Revision 4. Statistical Papers, Series M, 4(4), United Nations, New York